DOCKET
09-AFC-5
DATE
RECD. SEP 15 2010

ABENGOA MOJAVE SOLAR PROJECT

Commission Decision

CALIFORNIA
ENERGY COMMISSION
Arnold Schwarzenegger, Governor

SEPTEMBER 2010
CEC-800-2010-008 - CMF

DOCKET NUMBER 09-AFC-5

CALIFORNIA
ENERGY COMMISSION

1516 Ninth Street
Sacramento, CA 95814

http://www.energy.ca.gov/sitingcases/abengoa/index.html

COMMISSIONERS-

KAREN DOUGLAS, J.D.
Chair

JAMES D. BOYD
Vice Chair

JEFFREY D. BYRON
Commissioner

ANTHONY EGGERT
Commissioner

ROBERT B. WEISENMILLER, Ph. D
Commissioner

KOURTNEY C. VACCARO
Hearing Officer

DISCLAIMER

This report was prepared by the California Energy Commission Abengoa Mojave Solar Project AFC Committee as part of Abengoa Mojave Solar Project, Docket No. 09-AFC-5. The views and recommendations contained in this document are not official policy of the Energy Commission until the report is adopted at an Energy Commission Business Meeting.

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE ***ABENGOA MOJAVE SOLAR PROJECT***	**DOCKET NO. 09-AFC-5** **ORDER NO. 10-0908-8**

COMMISSION ADOPTION ORDER

This Commission Order adopts the Commission Decision on the ***Abengoa Mojave Solar Project.*** It incorporates the Presiding Member's Proposed Decision (PMPD) in the above-captioned matter and the Committee Errata. The Commission Decision is based upon the evidentiary record of these proceedings and considers the comments received at the September 8, 2010, business meeting. The text of the attached Commission Decision contains a summary of the proceedings, the evidence presented, and the rationale for the findings reached and Conditions imposed.

This **ORDER** adopts by reference the text, Conditions of Certification, Compliance Verifications, and Appendices contained in the Commission Decision. It also adopts specific requirements contained in the Commission Decision which ensure that the proposed facility will be designed, sited, and operated in a manner to protect environmental quality, to assure public health and safety, and to operate in a safe and reliable manner.

FINDINGS

The Commission hereby adopts the following findings in addition to those contained in the accompanying text:

1. The ***Abengoa Mojave Solar Project*** will provide a degree of economic benefits and electricity reliability to the local area.

2. The Conditions of Certification contained in the accompanying text, if implemented by the project owner, ensure that the project will be designed, sited, and operated in conformity with applicable local, regional, state, and federal laws, ordinances, regulations, and standards, including applicable public health and safety standards, and air and water quality standards.

3. Implementation of the Conditions of Certification contained in the accompanying text will ensure protection of environmental quality and assure reasonably safe and reliable operation of the facility. The Conditions of Certification also assure that the project will neither result in, nor contribute substantially to, any significant direct, indirect, or cumulative adverse environmental impacts.

4. Existing governmental land use restrictions are sufficient to adequately control population density in the area surrounding the facility and may be reasonably expected to ensure public health and safety.

5. The project is subject to Fish and Game Code section 711.4 and the project owner must therefore pay a nine hundred forty-nine dollar ($949) fee to the California Department of Fish and Game.

6. Construction and operation of the project, as mitigated, will not create any significant adverse environmental impacts. Therefore, the evidence of record also establishes that no feasible alternatives to the project, as described during these proceedings, exist which would reduce or eliminate any significant environmental impacts of the mitigated project.

7. The evidence of record does not establish the existence of any environmentally superior alternative site.

8. The evidence of record establishes that an environmental justice screening analysis was conducted and that the project, as mitigated, will not have a disproportionate impact on low-income or minority populations.

9. The Decision contains a discussion of the public benefits of the project as required by Public Resources Code section 25523(h).

10. The Decision contains measures to ensure that the planned, temporary, or unexpected closure of the project will occur in conformance with applicable laws, ordinances, regulations, and standards.

11. The proceedings leading to this Decision have been conducted in conformity with the applicable provisions of Commission regulations governing the consideration of an Application for Certification and thereby meet the requirements of Public Resources Code sections 21000 et seq. and 25500 et seq.

ORDER

Therefore, the Commission **ORDERS** the following:

1. The Application for Certification of the ***Abengoa Mojave Solar Project*** as described in this Decision is hereby approved and a certificate to construct and operate the project is hereby granted.

2. The approval of the Application for Certification is subject to the timely performance of the Conditions of Certification and Compliance Verifications enumerated in the accompanying text and Appendices. The Conditions and Compliance Verifications are integrated with this Decision and are not severable therefrom. While the project owner may delegate the performance of a Condition or Verification, the duty to ensure adequate performance of a Condition or Verification may not be delegated.

3. This Decision is adopted, issued, effective, and final on September 8, 2010.

4. Reconsideration of this Decision is governed by Public Resources Code, section 25530.

5. Judicial review of this Decision is governed by Public Resources Code, section 25531.

6. The Commission hereby adopts the Conditions of Certification, Compliance Verifications, and associated dispute resolution procedures as part of this Decision in order to implement the compliance monitoring program required by Public Resources Code section 25532. All conditions in this Decision take effect immediately upon adoption and apply to all construction and site preparation activities including, but not limited to, ground disturbance, site preparation, and permanent structure construction.

7. This Decision licenses the project owner to commence construction on the project within five years of this Decision date. Subject to the provisions of California Code of Regulations, title 20, section 1720.3, this license expires by operation of law when the project's start-of-construction deadline passes with no construction.

8. The project owner shall provide the Executive Director a check in the amount of nine hundred and forty-nine dollars ($949), payable to the California Department of Fish and Game.

9. The Executive Director of the Commission shall transmit a copy of this Decision and appropriate accompanying documents, including the Department of Fish and Game fee, as provided by Public Resources Code section 25537, California Code of Regulations, title 20, section 1768, and Fish and Game Code section 711.4.

10. We order that the Application for Certification docket file for this proceeding be closed effective the date of this Decision, with the exception that the docket file shall remain open for 30 additional days solely to receive material related to a petition for reconsideration of the Decision.

Dated: September 8, 2010, at Sacramento, California.

KAREN DOUGLAS
Chair

JAMES D. BOYD
Vice Chair

(Absent)
JEFFREY D. BYRON
Commissioner

ANTHONY EGGERT
Commissioner

ROBERT B. WEISENMILLER
Commissioner

TABLE OF CONTENTS

PAGE

INTRODUCTION 1
A. SUMMARY 1
B. SITE CERTIFICATION PROCESS 4
C. PROCEDURAL HISTORY 6
D. COMMISSION OUTREACH 8
E. PUBLIC COMMENT 8

I. PROJECT DESCRIPTION AND PURPOSE 9
SUMMARY AND DISCUSSION OF THE EVIDENCE 9
FINDINGS OF FACT 20
CONCLUSION OF LAW 20

II. PROJECT ALTERNATIVES 21
SUMMARY AND DISCUSSION OF THE EVIDENCE 21
FINDINGS OF FACT 35
CONCLUSIONS OF LAW 36

III. COMPLIANCE AND CLOSURE 37
SUMMARY OF THE EVIDENCE 37
FINDINGS OF FACT 38
CONCLUSIONS OF LAW 38
GENERAL CONDITIONS OF CERTIFICATION 39

IV. ENGINEERING ASSESSMENT 59
A. FACILITY DESIGN 59
SUMMARY AND DISCUSSION OF THE EVIDENCE 59
FINDINGS OF FACT 61
CONCLUSIONS OF LAW 62
CONDITIONS OF CERTIFICATION 62
B. POWER PLANT EFFICIENCY 78
SUMMARY AND DISCUSSION OF THE EVIDENCE 78
FINDINGS OF FACT 82
CONCLUSIONS OF LAW 83
C. POWER PLANT RELIABILITY 84
SUMMARY AND DISCUSSION OF THE EVIDENCE 85
FINDINGS OF FACT 87
CONCLUSIONS OF LAW 88
D. TRANSMISSION SYSTEM ENGINEERING 89
SUMMARY AND DISCUSSION OF THE EVIDENCE 90
FINDINGS OF FACT 95
CONCLUSIONS OF LAW 96
CONDITIONS OF CERTIFICATION 96

TABLE OF CONTENTS (Cont.)

PAGE

E. TRANSMISSION LINE SAFETY AND NUISANCE 103
SUMMARY AND DISCUSSION OF THE EVIDENCE 103
FINDINGS OF FACT 109
CONCLUSIONS OF LAW 109
CONDITIONS OF CERTIFICATION 110

V. PUBLIC HEALTH AND SAFETY 112
A. GREENHOUSE GAS EMISSIONS 112
INTRODUCTION AND SUMMARY 112
FINDINGS OF FACT 125
CONCLUSIONS OF LAW 127
B. AIR QUALITY 128
SUMMARY OF THE EVIDENCE 128
FINDINGS OF FACT 139
CONCLUSIONS OF LAW 140
CONDITIONS OF CERTIFICATION 140
C. PUBLIC HEALTH 165
SUMMARY AND DISCUSSION OF THE EVIDENCE 165
FINDINGS OF FACT 172
CONCLUSIONS OF LAW 173
CONDITIONS OF CERTIFICATION 173
D. WORKER SAFETY/FIRE PROTECTION 175
SUMMARY AND DISCUSSION OF THE EVIDENCE 175
FINDINGS OF FACT 185
CONCLUSIONS OF LAW 186
CONDITIONS OF CERTIFICATION 186
E. HAZARDOUS MATERIALS MANAGEMENT 193
SUMMARY AND DISCUSSION OF THE EVIDENCE 193
FINDINGS OF FACT 198
CONCLUSIONS OF LAW 200
CONDITIONS OF CERTIFICATION 200
F. WASTE MANAGEMENT 213
SUMMARY AND DISCUSSION OF THE EVIDENCE 213
FINDINGS OF FACT 220
CONCLUSIONS OF LAW 221
CONDITIONS OF CERTIFICATION 221

VI. ENVIRONMENTAL ASSESSMENT 229
A. BIOLOGICAL RESOURCES 229
SUMMARY AND DISCUSSION OF THE EVIDENCE 229
FINDINGS OF FACT 268
CONCLUSIONS OF LAW 270
CONDITIONS OF CERTIFICATION 271

TABLE OF CONTENTS (Cont.)

PAGE

B. SOIL AND WATER RESOURCES 306
SUMMARY AND DISCUSSION OF THE EVIDENCE 306
FINDINGS OF FACT 331
CONCLUSIONS OF LAW 331
CONDITIONS OF CERTIFICATION 331
C. CULTURAL RESOURCES 401
SUMMARY AND DISCUSSION OF THE EVIDENCE 401
FINDINGS OF FACT 408
CONCLUSIONS OF LAW 409
CONDITIONS OF CERTIFICATION 409
D. GEOLOGICAL AND PALEONTOLOGICAL RESOURCES 420
SUMMARY AND DISCUSSION OF THE EVIDENCE 420
FINDINGS OF FACT 423
CONCLUSIONS OF LAW 424
CONDITIONS OF CERTIFICATION 425

VII. LOCAL IMPACT ASSESSMENT 433
A. LAND USE. 433
SUMMARY AND DISCUSSION OF THE EVIDENCE 433
FINDINGS OF FACT 442
CONCLUSIONS OF LAW 443
CONDITIONS OF CERTIFICATION 443
B. TRAFFIC AND TRANSPORTATION 446
SUMMARY AND DISCUSSION OF THE EVIDENCE 446
FINDINGS OF FACT 453
CONCLUSIONS OF LAW 454
CONDITIONS OF CERTIFICATION 454
C. SOCIOECONOMICS & ENVIRONMENTAL JUSTICE 457
SUMMARY AND DISCUSSION OF THE EVIDENCE 457
FINDINGS OF FACT 464
CONCLUSIONS OF LAW 465
D. NOISE AND VIBRATION 467
SUMMARY OF THE EVIDENCE 467
FINDINGS OF FACT 476
CONCLUSIONS OF LAW 476
CONDITIONS OF CERTIFICATION 477
E. VISUAL RESOURCES 483
SUMMARY AND DISCUSSION OF THE EVIDENCE 483
FINDINGS OF FACT 519
CONCLUSIONS OF LAW 520
CONDITIONS OF CERTIFICATION 520

TABLE OF CONTENTS (Cont.)

APPENDIX A: *LAWS, ORDINANCES, REGULATIONS, AND STANDARDS*
APPENDIX B: *EXHIBIT LIST*
APPENDIX C: *PROOF OF SERVICE LIST*

INTRODUCTION

A. SUMMARY OF THE DECISION

This Decision contains the Commission's rationale in determining that the proposed Abengoa Mohave Solar Project (AMS) will, as mitigated, have no significant impacts on the environment and complies with all applicable laws, ordinances, regulations, and standards (LORS). The project may therefore be licensed. Our Decision is based exclusively upon the record established during this certification proceeding and summarized in this document. We have independently evaluated the evidence, provided references to the record[1] supporting our findings and conclusions, and specified the measures required to ensure that the AMS is designed, constructed, and operated in the manner necessary to protect public health and safety, promote the general welfare, and preserve environmental quality.

On August 10, 2009, the California Energy Commission received an Application for Certification (AFC) from Mojave Solar LLC (Applicant), a wholly owned subsidiary of Abengoa Solar Inc. The project will use established parabolic trough solar thermal technology to produce electrical power using a steam turbine generator fed from a solar steam generator. The solar steam generator receives heated heat transfer fluid (HTF) from solar thermal equipment comprised of arrays of parabolic mirrors that collect energy from the sun. The Energy Commission has exclusive jurisdiction to license this project and is considering the proposal under a review process established by Public Resources Code section 25540.6. The Energy Commission began review of the AMS on October 21, 2009.

The AMS site will occupy a 1,765-acre site in an unincorporated area of San Bernardino County near the community of Hinkley, California. The project site is accessed by Harper Lake Road, which is located approximately 20 miles west of Barstow along the Highway 58 corridor. The project site is approximately six miles north of where Harper Lake Road intersects with Highway 58. The existing Solar Generating Stations (SEGS) VIII and IX facilities owned by NextEra™ Energy Resources are immediately northwest of the project site.

---

[1] The Reporter's Transcript of the evidentiary hearings is cited as "date of hearing RT page __." For example: 6/28/10 RT 77. The exhibits included in the evidentiary record are cited as "Ex. number." A list of all exhibits is contained in **Appendix B** of this Decision.

The project will have a combined nominal electric output of 250 MW from twin, independently operable solar fields. Each field will feed a 125 MW power island. One site, known as the Alpha site, is in the northwest portion of the project site and will occupy 884 acres. The Beta site is in the southwest portion of the project site and will occupy 800 acres. The Alpha and Beta sites will share the remaining 81 acres of the project site for activities that include receiving and discharging offsite drainage improvements.

The proposed collector fields are comprised of single-axis-tracking parabolic trough solar collectors. These collectors are arranged to form many parallel rows aligned on a north-south axis. Each solar collector has a linear, parabolic-shaped reflector that focuses the sun's radiation on a specially designed linear receiver known as a heat collection element (HCE). The collectors track the sun from east to west to ensure that the maximum amount of the sun's radiation is continuously focused on the HCE.

The HTF is heated to approximately 740° F as it circulates through the HCEs and returns to a series of heat exchangers where the fluid is used to generate steam in the solar steam generator system at the power island, thereby providing steam to the steam turbine generator.

The project will use a wet cooling tower for power plant cooling. Water for cooling and other plant purposes will come from Harper Valley Ground Basin groundwater obtained from onsite wells. The Alpha and Beta sites will each have two newly constructed wells. These wells will draw the groundwater cased on adjudicated water rights of the Applicant. A single treatment facility will be installed for each pair of wells to treat the groundwater to meet potable standards for employee use. A septic system and onsite leach field will be used to dispose of sanitary wastewater.

According to pumping test data, groundwater supply wells on the plant site have sufficient capacity to meet the project's water supply requirements. Each solar field's estimated operation and potable water use is shown below.

//

//

Water Use for Each Field

Water Use	***Average Rate (Gallons-Minute)***	***Peak Rate (Gallons/Minute)***	***Estimate Annual Use (Acre-Feet)***	***Estimated Maximum Annual Use (Acre-Feet)***
Plant Operation	667	1,093	850	1,077
Potable Water	3.1	3.1	5, max	5

To conserve water, the lower total dissolved solids (TDS) reverse osmosis eject streams will be recycled back to the service water storage tank for reuse in the cooling tower. Additionally, a clear well will be used and when the discharge exceeds the treatment system demand, the clear well discharge will be released to the cooling tower to further conserve water. To reduce overall water consumption and sizing of evaporation ponds, service water will first be used as makeup to the cooling tower and circulating water system.

The sun will provide 100 percent of the power supplied to the AMS project through solar thermal collectors. No supplementary fossil-based energy source such as natural gas is proposed for electrical power production. However, each power island will have a natural-gas-fired auxiliary boiler to provide equipment freeze protection and HTF freeze protection. The auxiliary boiler will supply steam to HTF heat exchangers as needed during offline hours to keep the HTF in a liquid state when ambient temperatures fall below its freezing point of 54° F. Each power island will also have a diesel engine-driven firewater pump for fire protection and a diesel engine-driven backup generator for power plant essentials.

All project-related transmission facilities will be within the project boundaries except (1) the connection within the existing SCE transmission right-of-way adjacent to the site and (2) downstream telecommunications facilities. The AMS site is located approximately 32 transmission-miles west of the Cool Water generating facility and approximately 13 transmission-miles east of the Kramer interconnection substation. The AMS transmission line will interconnect with the Southern California Edison (SCE) 230-kV Kramer-Cool Water #1 transmission, which is located adjacent to the southern border of the AMS site.

SCE proposes to construct the new Lockhart Substation and associated facilities (including fiber optic cable routes located outside the AMS site), to interconnect the AMS project to the Kramer–Coolwater 220-kV line. The Lockhart Substation and related tie line connections and the distribution line for the substation's light and power are proposed to be located within the footprint of the AMS site. A portion of the interconnection to the 220-kV line – the proposed 200 foot long "transmission line loop" – would be located partially outside the limits of the AMS boundary and within the existing SCE right-of-way for the Kramer-Coolwater 220-kV line.

Project construction is scheduled to begin in fourth quarter 2010, with a project completion and operational date in first quarter 2013. The project's life is estimated to be 30 to 40 years.

If approved, the AMS project will result in the influx of temporary workers to the area during the 26-month construction period. Once operational, the plant will employ approximately 68 full-time workers. The peak number of temporary workers needed for the project is 1,162 and the average number of workers per day is 830.

B. SITE CERTIFICATION PROCESS

The AMS and its related facilities are subject to Energy Commission licensing jurisdiction. (Pub. Res. Code, § 25500 et seq.). During licensing proceedings, the Commission acts as lead state agency under the California Environmental Quality Act (CEQA). (Pub. Res. Code, §§ 25519(c), 21000 et seq.) The Commission's regulatory process, including the evidentiary record and associated analyses, is functionally equivalent to the preparation of an Environmental Impact Report. (Pub. Res. Code, § 21080.5.) The process is designed to complete the review within a specified time period when the required information is submitted in a timely manner. A license issued by the Commission is in lieu of other state and local permits.

The Commission's certification process provides a thorough review and analysis of all aspects of a proposed power plant project. During this process, the Energy Commission conducts a comprehensive examination of a project's potential economic, public health and safety, reliability, engineering, and environmental ramifications.

Specifically, the Commission's process allows for and encourages public participation so that members of the public may become involved either informally or on a formal level as intervenor parties who have the opportunity to present evidence and cross-examine witnesses. Public participation is encouraged at every stage of the process.

The process begins when an applicant submits an AFC. Commission staff reviews the data submitted as part of the AFC and makes a recommendation to the Commission on whether the AFC contains adequate information to begin the certification process. After the Commission determines an AFC contains sufficient analytic information, it appoints a Committee of two Commissioners to conduct the formal licensing process. This process includes public conferences and evidentiary hearings, where the evidentiary record is developed and becomes the basis for the Presiding Member's Proposed Decision (PMPD). The PMPD determines a project's environmental impact and conformity with applicable laws, ordinances, regulations, and standards and provides recommendations to the full Commission.

The initial portion of the certification process is weighted heavily toward assuring public awareness of the proposed Project and obtaining necessary technical information. During this time, the Commission staff sponsors public workshops at which intervenors, agency representatives, and members of the public meet with staff and the applicant to discuss, clarify, and negotiate pertinent issues. In this proceeding, Staff published its initial technical evaluation of the AMS project in its Staff Assessment (SA) and made it available for a 30-day comment period. Staff's responses to public comment on the SA and its complete analyses and recommendations were published in Supplemental Staff Assessment Parts A through C, which were made available for public comment.

Following this, the Committee conducts a Prehearing Conference to assess the adequacy of available information, identify issues, and determine the positions of the parties. Based on information presented at this event, the Committee issues a Hearing Order to schedule formal evidentiary hearings. At the evidentiary hearings, all formal parties, including intervenors, may present sworn testimony, which is subject to cross-examination by other parties and questioning by the Committee. Members of the public may offer oral or written comments at these hearings. Evidence submitted at the hearings provides the basis for the Committee's analysis and recommendations to the full Commission.

The Committee's analysis and recommendations appear in the PMPD, which is available for a 30-day public comment period. Depending upon the extent of revisions necessary after considering comments received during this period, the Committee may elect to publish a revised version. If so, the Revised PMPD triggers an additional public comment period. Finally, the full Commission decides whether to accept, reject, or modify the Committee's recommendations at a public hearing.

Throughout the licensing process, members of the Committee, and ultimately the Commission, serve as fact-finders and decision-makers. Other parties, including the Applicant, Commission staff, and formal intervenors, function independently with equal legal status. An "ex parte" rule prohibits parties in the case, or other persons with an interest in the case, from communicating on substantive matters with the decision-makers, their staffs, or assigned hearing officer unless these communications are made on the public record. The Office of the Public Adviser is available to assist the public in participating in all aspects of the certification proceeding.

C. PROCEDURAL HISTORY

Public Resources Code, sections 25500 et seq. and Energy Commission regulations (Cal. Code Regs., tit. 20, § 1701, et seq.) mandate a public review process and specify the occurrence of certain procedural events in which the public may participate. The key procedural events that occurred in the present case are summarized below.

On August 10, 2009, the California Energy Commission received an Application for Certification (AFC) from Mojave Solar LLC, a wholly owned subsidiary of Abengoa Solar, Inc., seeking approval to construct and operate a solar electric generating facility. On October 21, 2009, the Energy Commission deemed the AFC data adequate (sufficient data to proceed) and assigned a Committee of two Commissioners to conduct proceedings.

The formal parties included the Applicant, Energy Commission staff (Staff), and Intervenors California Unions for Reliable Energy (CURE), Luz Solar Partners Ltd., VIII, Luz Solar Partners Ltd., IX, and the County of San Bernardino.

On November 17, 2009, the Committee issued a Notice of "Informational Hearing, Environmental Scoping Meeting, and Public Site Visit." The Notice was mailed to local agencies and members of the community who were known to be

interested in the project, including the owners of land adjacent to or in the vicinity of the AMS project. The Public Adviser's Office also advertised the public hearing and site visit and distributed information to local officials and sensitive receptors surrounding the project site.[2]

On December 9, 2009, the Committee conducted a site visit to tour the proposed AMS site and then convened a public Informational Hearing at the City Council Chambers in Barstow, California. At that event, the Committee, the parties, interested governmental agencies, and other public participants discussed issues related to development of the project, described the Commission's review process, and explained opportunities for public participation.

On December 21, 2009, the Committee issued an initial Scheduling Order. The Committee Schedule was based on both the Applicant's and Staff's proposed schedules and related discussion at the Informational Hearing. The schedule contained a list of events that must occur in order to complete the certification process within twelve months.

In the course of the review process, Staff conducted a public workshop on December 8, 2009, which was a publicly noticed "Clarification of Data Requests, Data Response and Issue Resolution, and Project Schedule" workshop at the Energy Commission headquarters. The purpose of the workshop was to provide members of the community and governmental agencies opportunity to obtain project information, and to offer comments regarding any aspect of the proposed project.

On January 15, 2010, Staff conducted a second publicly noticed "Clarification of Data Requests, Data Response and Issue Resolution, and Project Schedule" workshop to address topics that included potential project impacts to air quality, biological resources, cultural resources, geology, hazardous materials, land use, public health, and soil and water resources.

The Staff Assessment was issued on March 15, 2010. On April 6, 2010, Staff conducted a third publicly noticed workshop at the Energy Commission headquarters to solicit and address public comments on the Staff Assessment. On April 7, 2010, Staff conducted a fourth publicly noticed workshop at the City of Barstow City Hall to solicit and address public comments on the Staff

[2] Sensitive receptors are people or institutions with people that are particularly susceptible to illness, such as the elderly, very young children, people already weakened by illness (e.g., asthmatics), and persons engaged in strenuous exercise.

Assessment. On April 15, 2010 and May 6, 2010, the Committee conducted publicly noticed status conferences to discuss issues in the proceedings.

The Energy Commission Supplemental Staff Assessment Part A was published on May 12, 2010. Supplemental Staff Assessment Part B was published on May 25, 2010, and Supplemental Staff Assessment Part C was published on June 30, 2010. The public was provided with an opportunity to comment on each document. The Committee conducted the Prehearing Conference on June 21, 2010, and the Evidentiary Hearings were held on June 28, June 29, and July 15, 2010.

The Committee published the PMPD on August 6, 2010, and held a Committee Conference in Sacramento at Commission Headquarters on August 23, 2010. The Full Commission adopted the PMPD and Errata at the September 8, 2010, business meeting.

D. COMMISSION OUTREACH

Several entities within the Energy Commission provide various notices concerning power plant siting cases. Staff provides notices of staff workshops and the release of the Staff Assessments. The Hearing Office notices Committee-led events such as the informational hearing and site visit, status conferences, the prehearing conference, and evidentiary hearings. The Public Adviser's Office provides additional outreach for critical events as well as provides information to interested persons that would like to become more actively involved in a power plant siting proceeding. Further, the Media Office provides notice of events to local and regional press through press releases. The public may also subscribe to the proceeding's e-mail List Server offered on the web page for each project which gives an immediate notification of documents posted to the project web page. Through the activities of these entities, the Energy Commission has made every effort to ensure that interested persons are notified of activities in this proceeding.

E. PUBLIC COMMENT

The record contains public comments from concerned individuals and organizations. Throughout these proceedings, as reflected in the transcribed record, the Committee provided an opportunity for public comment at each Committee-sponsored conference and hearing.

I. PROJECT DESCRIPTION AND PURPOSE

The Applicant filed an AFC for the AMS project on August 10, 2009. The project is a solar electric generating facility to be located on 1,765 acres in unincorporated San Bernardino County. The Applicant will own and operate the project.

The project site is comprised of private property historically used as the Lockhart Ranch complex. The site once served as an agricultural and cattle center and included farming activities that used flood and pivot system irrigation. There is currently one active pivot irrigation field in production on the property.

The project site is accessed by Harper Lake Road, which is located approximately 20 miles west of Barstow along the Highway 58 corridor. The project site is accessed by Harper Lake Road, which is located approximately 20 miles west of Barstow along the Highway 58 corridor. The project site is approximately six miles north of where Harper Lake Road intersects with Highway 58. **Project Description Figures 1 and 2** below respectively provide a vicinity and site map for the AMS project.

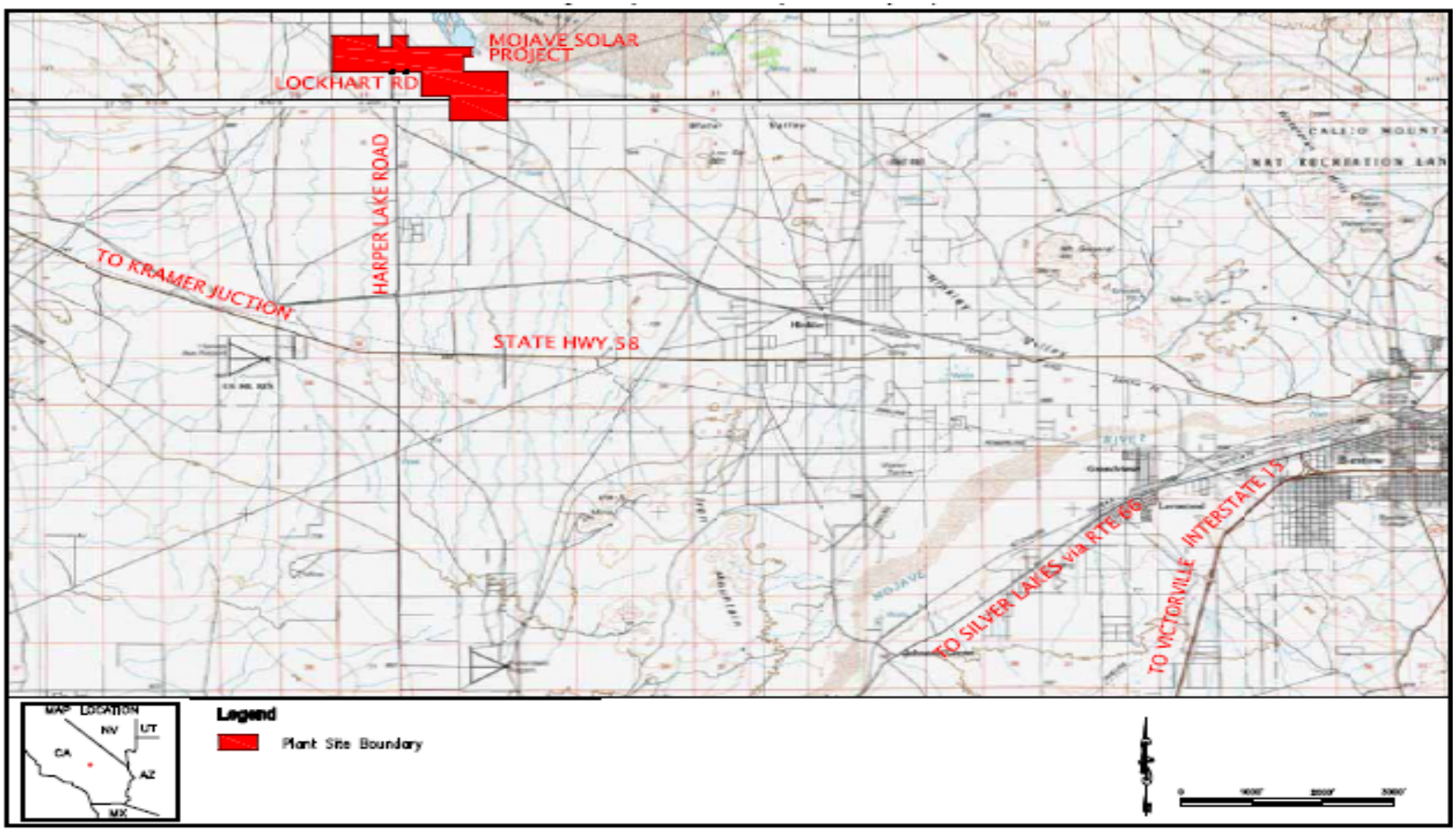
SUMMARY AND DISCUSSION OF THE EVIDENCE

The evidence presented was undisputed. (6/28/10 RT 51-59, 64-76, 81; Exs. 1, §§ 1.0, 2.0, 3.0, 5.1, Appendixes M, O, 2, 3, 4, 5, 10, 11, 13, 18, 19, 23, 26, 33, 44, 45, 48 [§§ 1.0, 17.0]; 302, §3.)

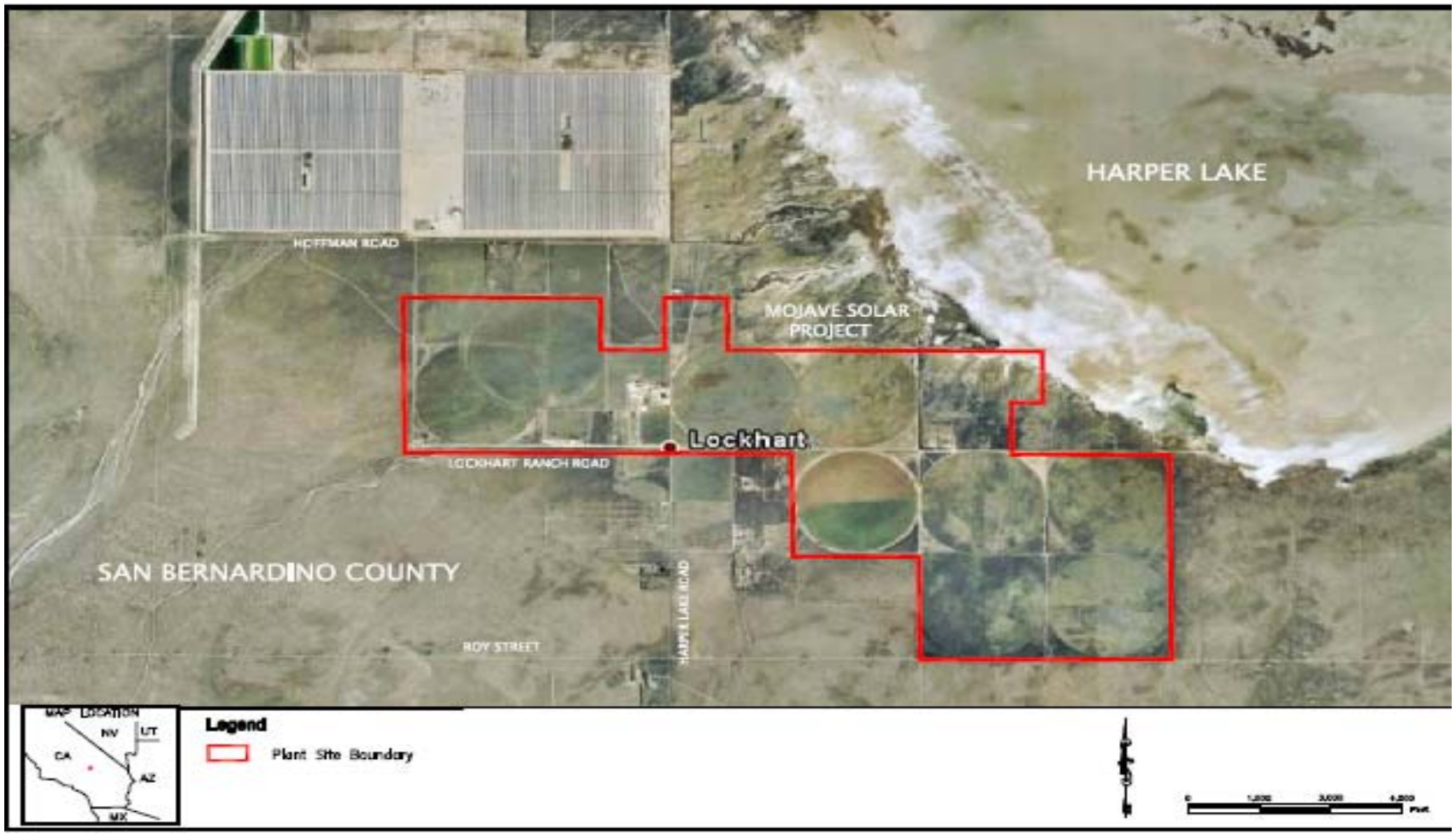
The project proposes the use of solar parabolic trough technology to activate a heat transfer fluid. Within rows of solar collectors, each solar collector focuses the sun's radiation on a heat collection element (HCE). As heat transfer fluid (HTF) is circulated through the solar field, light from the sun reflects off the solar collector's parabolic troughs and is concentrated on the HCEs. This HTF provides a high-temperature energy source used to generate steam in steam generators. Electrical power is generated as the steam expands through the steam turbine generators.

The project would have a combined nominal electrical output of 250 megawatts (MW) from two, independently-operable solar fields, each feeding a 125-MW power island: the 884-acre Alpha site and 800-acre Beta site. Alpha is located in the northwest portion of the project site and Beta is located in the southeast portion.

Project Description - Figure 1
Project Vicinity Map
(Source: Ex. 300)



Project Description Figure 2
Project Site Map
(Source: Ex. 300)



The sites will join at an on-site transmission line interconnection substation to form one full-output transmission interconnection. Each power island would have its own warehouse and control/admin building. Solar collector array assembly buildings would be installed in the northeast portion of the Alpha solar field, which will later be converted to warehouses. The total combined area of the various proposed project buildings and pre-engineered enclosures (e.g., control/admin building, warehouse, electrical equipment enclosures, etc.) is approximately 185,000 square feet.

An additional 81 acres of the project site will be shared by Alpha and Beta for receiving and discharging offsite drainage improvements. (Exs. 1 § 2; 302, pp. 3-2 – 3-3.)

Construction of the AMS facility, from site preparation and grading to commercial operation, is expected to take place over a 26-month period. Commercial service is expected by winter of 2013. (Ex. 302, p. 5.10-3.) Once operational, the plant will employ approximately 68 full-time workers. The peak number of temporary workers needed for the project is 1,162 and the average number of workers per day is 830. (Exs. 1, p. 2.0-27; 302, p. 5.10-12.) Capital costs for construction alone are projected to be approximately $121 million. (Ex. 1, p. 5.11-27.)

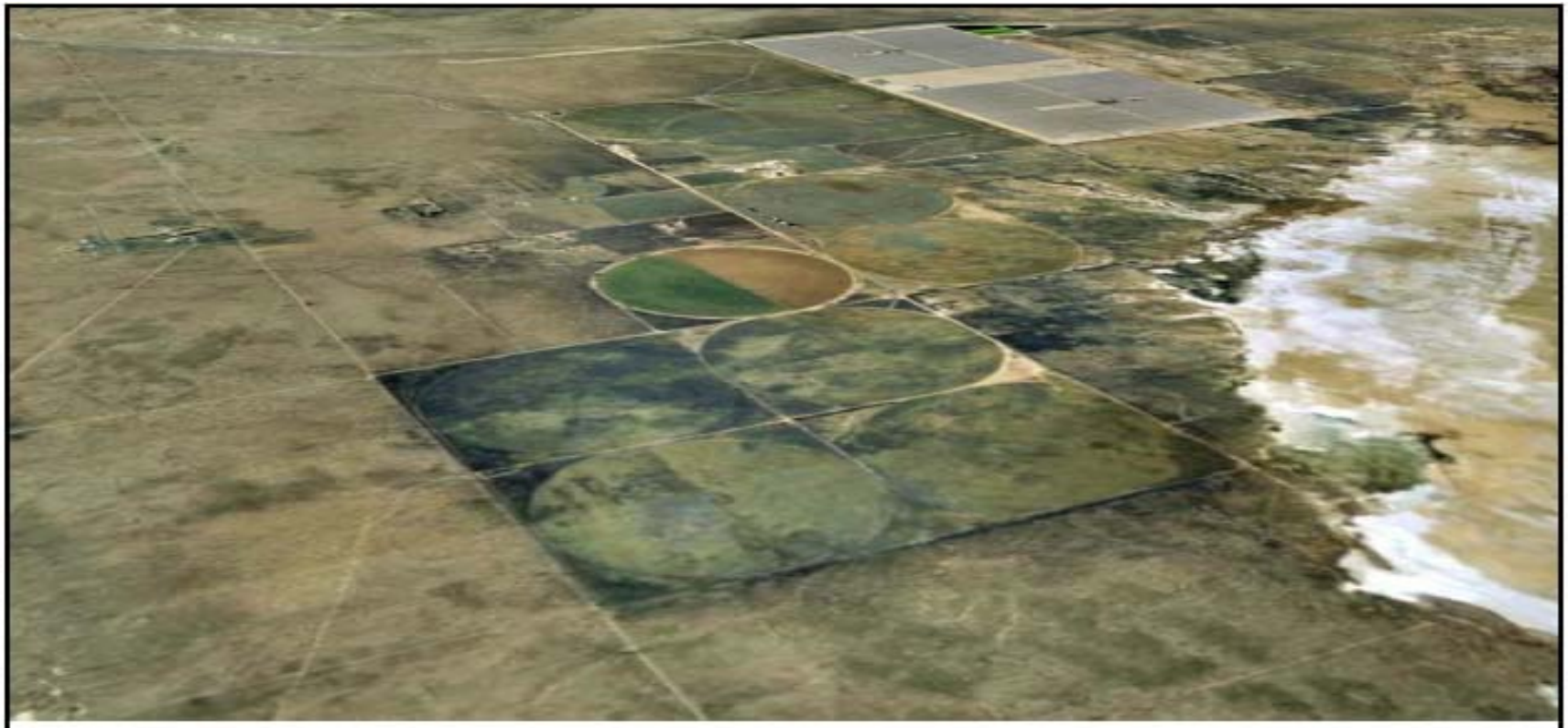
Project Description Figure 3 below shows the project site in its pre-construction condition. **Project Description Figure 4** below depicts the project site after construction.

//

//

//

Project Description Figure 3
Visual Appearance of the Site Prior to Construction
(Source: Ex. 300)



Project Description Figure 4
Visual Appearance of the Site after Construction
(Source: Ex. 300)

1. Project Objectives

The Applicant's stated project objectives are as follows:

- To help achieve California renewable energy objectives and to support the state's Renewable Portfolio Standard requirements by providing long term production of renewable electric energy;
- To safely and economically construct, operate and maintain an efficient, reliable and environmentally-sound power generating facility;
- To develop a project using up-to-date and improved versions of an already-proven renewable energy technology, minimizing technical risk and improving the financial viability of the project;
- To maximize the renewable energy from a site with an excellent solar resource, appropriate slope and grading, availability of water rights and availability of transportation and other infrastructure in order to minimize the cost of renewable energy for consumers;
- To reduce or eliminate potentially significant adverse environmental impacts of the project by locating away from sensitive noise and visual receptors and sensitive species;
- To electrically interconnect to suitable electrical transmission while minimizing environmental impacts associated with interconnection and minimizing cost; and
- To develop a site with close proximity to natural gas infrastructure in order to minimize environmental impacts and cost. (Exs. 1, pp. 2.0-2 – 2.0-3; 302, pp. 3-1 – 3-2.)

2. Associated Facilities and Processes

a. Transmission

The power generated by the project will be transmitted to Southern California Edison's (SCE's) transmission grid through SCE's existing 230-kilovolt (kV) Kramer-Cool Water #1 transmission line. All project-related transmission facilities will be within the project boundaries except (1) the connection within the existing SCE transmission right-of-way adjacent to the site and (2) downstream telecommunications facilities.

The project's key transmission components include:

- Constructing a new 220 kV substation, identified as the Lockhart substation, and related facilities to interconnect AMS to SCE's Kramer-Cool Water #1 line.

- Looping the Kramer-Cool Water #1 line into the new Lockhart substation.

- Connecting the existing Hutt 12 kV distribution circuit out of the Hutt Poletop Substation replacing one and removing one existing pole approximately 40 feet north of the Lockhart substation.

- Installing fiber optic communication cables, associated poles, conduits, and other telecommunication facilities to provide diverse path routing of communications for AMS project interconnection and to provide communications redundancy at the two ASM project power blocks. (Ex. 302, pp. 3-6 - 3-7.)

b. Gas Supply

The sun will provide 100% of the power supplied to the project through solar-thermal collectors. No supplementary fossil-based energy source (e.g., natural gas) is proposed for electrical power production. Natural gas for the AMS project's ancillary purposes, such as firing the auxiliary boilers and space heating, would be supplied by an existing Southwest Gas Corporation-owned pipeline that runs to the project boundary. No off-site pipeline facilities are proposed for this project. (Exs. 1, pp. 2.0-1 – 2.0-2, 2.0-13; 302, p. 3-3.)

c. Water Supply

Water uses for the project include makeup for the circulating water system and cooling tower, makeup for the solar steam generators, water for solar collector arrays, service water, potable water and fire protection water. Groundwater from adjudicated water rights to the Harper Valley Groundwater Basin will be the sole source of water supply for these various water uses. The Mojave Water Agency administers the adjudicated water rights

The groundwater will be pumped from newly constructed wells located on the Alpha and Beta sites. No offsite backup cooling water supply is planned. Use of multiple onsite water supply wells, redundancy in the well equipment, and reserve water storage is expected to provide an inherent backup in the event of outages affecting one of the onsite supply wells. More specifically, both the

Alpha and Beta fields will have raw water and service water storage tanks, each with a capacity of 1,930,000 gallons and sufficient storage capacity to allow for interruption of water supply to the facility. A portion of each service water storage tank (approximately 360,000 gallons) will be dedicated to the plant's fire protection water system, for a total of 720,000 gallons for the entire project.

The proposed groundwater supply has a total dissolved solids (TDS) concentration of approximately 1,200 50 1,500 mg/L, and is therefore considered brackish and unsuitable for municipal supply or other potable uses without treatment. A packaged water treatment system will be used by the project to treat the groundwater to meet potable standards.

The Applicant agrees to use no more than 2,160 acre feet per year (AFY) of groundwater for each year that it is in operation. (Exs. AFC, p. 2.0-14; SSA B, pp. 3-3 – 3-4.)

d. Water Treatment

The raw water, circulating water, process water and solar collector array (SCA) washing water all require onsite treatment, and this treatment varies according to the quality required for each of these uses. The groundwater will be pumped to the raw water storage tank, and a biocide (sodium hypochlorite) will be used to treat the water. If necessary, the water will be treated again with the biocide when it is transferred to the service water tank. This water would be used directly in the cooling tower as make-up water.

e. Project Water Conservation

The project will implement practices to conserve water. For instance, the lower TDS reverse osmosis reject streams would be recycled back to the service water storage tank for reuse in the cooling tower. Additionally, a clear well would be used, and when the discharge exceeds the treatment system demand, the clear well discharge would be released to the cooling tower to further conserve water. And, to reduce overall water consumption and sizing of evaporation ponds, service water will first be used as makeup to the cooling tower and circulating water system. (Exs., 1, pp. 2.0-15 – 2.0-18; 302, p. 3-4.)

Additional conservation measures to be undertaken by the project owner independent of plant operations are discussed in the **Soil and Water Resources** section of this Decision.

f. Solar Collector Array Washing

To facilitate dust and contaminant removal, the project will use demineralized water to periodically clean the SCAs. Cleaning is generally performed at night by way of a water truck spraying deionized water on the SCAs in a drive-by fashion. Water from these cleaning activities is expected to evaporate on the SCA with minimal water applied to the ground. No site runoff or recharge is anticipated from this process. (Exs. 1, p. 2.0-17; 302, p. 3-4.)

g. Water Discharge

The AMS project proposes the use of four five-acre evaporation ponds for wastewater treatment effluent disposal. Wastewater treatment effluent consists of concentrated brine resulting from several cycles of reuse in the wet cooling tower followed by a series of wastewater treatment processes. Evaporation ponds use solar energy to evaporate wastewater into the atmosphere, leaving the solids in the pond. The residual solids are expected to remain in the pond for life of the AMS project.

The Alpha and Beta sites will each have two double-lined evaporation ponds with a nominal surface area of five acres each for a total of 10 acres per field, or 20 acres for the entire project. The ponds will be designed in accordance with Lahontan Regional Water Quality Control Board (RWQCB) requirements and subject to RWQCB permitting review for issuance of Waste Discharge Requirements (WDR). As a result, the ponds will be required to meet stringent regulatory requirements for matters such as construction, materials, and leak detection to ensure appropriate protection to underlying groundwater.

Using multiple ponds will allow plant operations to continue if one pond is temporarily unavailable for maintenance. (Exs. 1, p. 2.0-19; 302, pp. 3-4 – 3-5.)

h. Non-Hazardous Solid Waste

Construction, operation, and maintenance of the AMS project will generate non-hazardous solid wastes typical of power generation or other industrial facilities. These wastes include scrap metal and plastic, insulation material, paper, glass, empty containers, and other miscellaneous solid wastes. These materials would be disposed of through contracted refuse collection and recycling services. (Exs. 1, p. 2.0-20; 302, p. 3-5.)

i. Hazardous Waste Management

Construction and operation of the project requires use and storage of hazardous materials such as gasoline, diesel fuel, oil, lubricants, and small quantities of solvents and paints. All hazardous materials used during construction and operation would be stored onsite in storage tanks/vessels/containers specifically designed for this purpose.

The Applicant must implement several different of safety-related plans and programs to ensure safe handling, storage, and use of hazardous materials. Plant personnel will receive appropriate personal protective equipment. They will also receive training on the proper use, handling and cleanup of hazardous materials and on the procedures to be followed in the event of a leak or spill.

Adequate supplies of appropriate cleanup materials will also be stored onsite. (Exs. 1, p. 2.0-20; 302, p. 3-5.)

j. Fire Protection.

The AMS fire protection systems will include a fire protection water system and portable fire extinguishers. The fire protection water system would be supplied from a dedicated 360,000-gallon portion of the 1,930,000-gallon service water storage tanks located on each plant field. One electric and one diesel-fueled backup firewater pump, each with a capacity of 3,000 gallons per minute, would deliver water to the fire-protection water piping network on each plant site. A smaller electric motor-driven jockey pump would maintain pressure in the piping network.

The piping network would supply fire hydrants located at intervals throughout the power island, a sprinkler deluge system at each unit transformer, HTF expansion tank and circulating pump area, and sprinkler systems in the operations and administration buildings. Portable fire extinguishers of appropriate sizes and types will be located throughout the plant site. Fire protection for each solar field would be provided by zoned isolation of the HTF lines in the event of a rupture that results in fire. (Exs. 1, p. 2.0-21; 302, p. 3-6.)

3. Facility Closure

The AMS project has an expected operating life of between 30 years to 40 years. Whenever the facility is closed, whether temporarily or permanently, the closure

procedures included in this Decision will ensure compliance with applicable laws, ordinances, regulations, and standards (LORS). (Ex. 302, p. 3-8.)

FINDINGS OF FACT

Based on the evidentiary record, we find as follows:

1. Mojave Solar LLC will own and operate the AMS project on private land in San Bernardino County.

2. The project will have a combined nominal electrical output of 250 megawatts (MW) from twin, independently-operable solar fields, each feeding a 125-MW power island.

3. The project includes associated transmission lines and the use of an existing gas supply line.

4. The project and its objectives are adequately described by the relevant documents contained in the record.

5. The AMS will contribute to meeting the Applicant's goal of supplying renewable energy to the California energy market.

CONCLUSION OF LAW

1. We therefore conclude that the AMS project is described at a level of detail sufficient to allow review in compliance with the provisions of both the Warren-Alquist Act and the California Environmental Quality Act.

II. PROJECT ALTERNATIVES

The California Environmental Quality Act (CEQA) Guidelines and the Energy Commission's regulations require an evaluation of the comparative merits of a range of feasible site and facility alternatives that represent the basic objectives of the proposed project but would avoid or substantially lessen potentially significant environmental impacts.[3] (Cal. Code Regs., tit. 14, §§ 15126.6(c) and (e); *see also*, tit. 20, § 1765.)

The range of alternatives, including the "No Project" alternative, is governed by the "rule of reason" and need not include those alternatives whose effects cannot be reasonably ascertained and whose implementation is remote and speculative. (Cal. Code Regs., tit. 14, § 15126.6(f).) Rather, the analysis is necessarily limited to alternatives that the "lead agency determines could feasibly attain most of the basic objectives of the project." (*Id*.)

The Applicant provided an alternatives analysis in the AFC and related supplementary documentation, describing the site selection process and project configuration in light of the Applicant's project objectives. Staff included a similar analysis in the Staff Assessment. The evidence on this topic was undisputed. (Exs. 6/28/10 RT 64-76, 81, 1, §§ 4.0; 2, 3; 4, 26, 48 [§ 20.0]; 300, §7.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Project Description and Setting

The AMS project site is located near the western margin of Harper Dry Lake, in the former town of Lockhart in unincorporated San Bernardino County. The 1,765-acre site consists of 14 privately-owned parcels. The site was historically used for agricultural production and cattle ranching, and is currently mostly barren with small areas of desert saltbrush scrub.

[3] Public Resources Code section 25540.6(b) requires an Applicant for a power plant such as the AMS project, which is otherwise exempt from the notice of intention process, to include information on the site selection criteria, alternative sites, and the reasons for choosing the proposed site. Section 1765 of the Commission's regulations further requires the parties to present evidence on alternative sites and facilities. Based on the totality of the record and as reflected in our findings for each of the technical topics, the mitigated AMS project will not result in any significant adverse effects on the environment. Nevertheless, this alternatives analysis is necessary to ensure compliance with CEQA Guidelines and Commission regulations. (Cal. Code Regs., tit. 14, § 15126.6 and tit. 20, § 1765.)

The project consists of two independently-operated 125-MW solar fields. The Alpha field is comprised of 884 acres in the northwest portion of the project site. The Beta field is comprised of 800 acres in the southeast portion of the project site. Each solar field would feed into its own 125-MW power island, and then join at the transmission line interconnection substation located on the Beta site. The full output transmission interconnection would connect to Southern California Edison's existing Kramer–Cool Water #1 230-kV transmission line, which runs adjacent to the southern border of project site.

Groundwater from onsite wells would supply water needs for process water makeup, solar collector array washing, and potable uses. The Applicant anticipates water use of no more than about 2,160 acre feet per year (AFY) of groundwater. (Exs. 1, §§ 4.0; 3; 48 [§20.0]; 300, §7.)

2. Project Objectives

The Applicant selected the proposed site to satisfy the following project objectives:

- Help achieve the California renewable energy objectives and to support the state's electric utility requirements with the long term production of renewable electric energy;
- Safely and economically construct, operate and maintain an efficient, reliable, and environmentally-sound power generating facility;
- Develop a project using up-to-date and improved versions of an already-proven renewable energy technology, minimizing technical risk and improving the financial viability of the project;
- Maximize the renewable energy from a site with an excellent solar resource, appropriate slope and grading, availability of water rights and availability of transportation and other infrastructure in order to minimize the cost of renewable energy for consumers;
- Reduce or eliminate potentially significant adverse environmental impacts by locating away from sensitive noise and visual receptors and sensitive species;
- Electrically interconnect to suitable electrical transmission while minimizing environmental impacts associated with interconnection and minimizing cost;
- Develop a site with close proximity to natural gas infrastructure in order to minimize environmental impacts and cost; and
- Meet the requirements of the October 2009 power purchase agreement with PG&E. (Exs. 1, p. 4.0-2, 300, p. 7-4.)

Staff evaluated whether the Applicant's stated objectives were sufficiently broad to allow for development of a reasonable range of project alternatives. To ensure such breadth, Staff reduced and reframed the objectives as follows:

- To safely and economically construct and operate a mid-sized (250 MW) solar power generating facility in California that will meet regional and state-wide needs.
- To site the facility in areas with high solar energy potential and consistent with local land use plans, and where it can be interconnected to the existing transmission system without substantial upgrade or cost.
- To start commercial operation by winter of 2012. (Ex. 300, p 7-5.)

3. Alternative Site Evaluation

a. Sites Identified by the Applicant

The Applicant identified and ultimately rejected six possible alternative sites in the Mojave Desert. The evidence shows that the Applicant applied a variety of screening criteria in identifying, evaluating, and rejecting the alternative sites.

Site feasibility criteria included site suitability (e.g., solar resource, size and shape, slope), economic viability, minimization of environmental impacts, availability of infrastructure, and site control. (Exs. 1 p. 4.0-3.) Thus, the Applicant's target size for each possible alternative site was about 1,600 acres, with approximate dimensions of 2.5 miles from east to west and 1.0 miles north to south. Land characteristics included locations within 25 miles of an interconnection to a transmission system that would deliver power to the California Independent System Operator (CAISO) grid, solar insolation at 0.25 kWh/(m^2-day) intervals, and nearby transportation infrastructure. (Exs. 1, pp. 4.0-4 – 4.0-5, 300, pp. 7-6 – 7-8.)

Based on these criteria, the Applicant identified the following six screening areas:

1) **Superior Dry Lake.** A partially disturbed site consisting of Bureau of Land Management (BLM), Department of Defense, and private land north of Barstow and just south of Fort Irwin Military Base.

2) **Coyote Dry Lake**. A partially disturbed site consisting of BLM and private land northeast of Barstow and south of Fort Irwin Military Base.

3) **Bristol Dry Lake**. An undisturbed site consisting of BLM land south of Amboy and east of Twentynine Palms Marine Corps Air Ground Combat Center.

4) **Imperial Valley**. A disturbed site consisting of private property south of the Salton Sea and south of Interstate 8.

5) **Imperial Valley East**. An undisturbed site consisting of BLM property east of El Centro.

6) **Northwest of Blythe.** A partially disturbed site consisting of BLM land northwest of Blythe. (Ex. 1, pp. 4.0-6 – 4.0-6.)

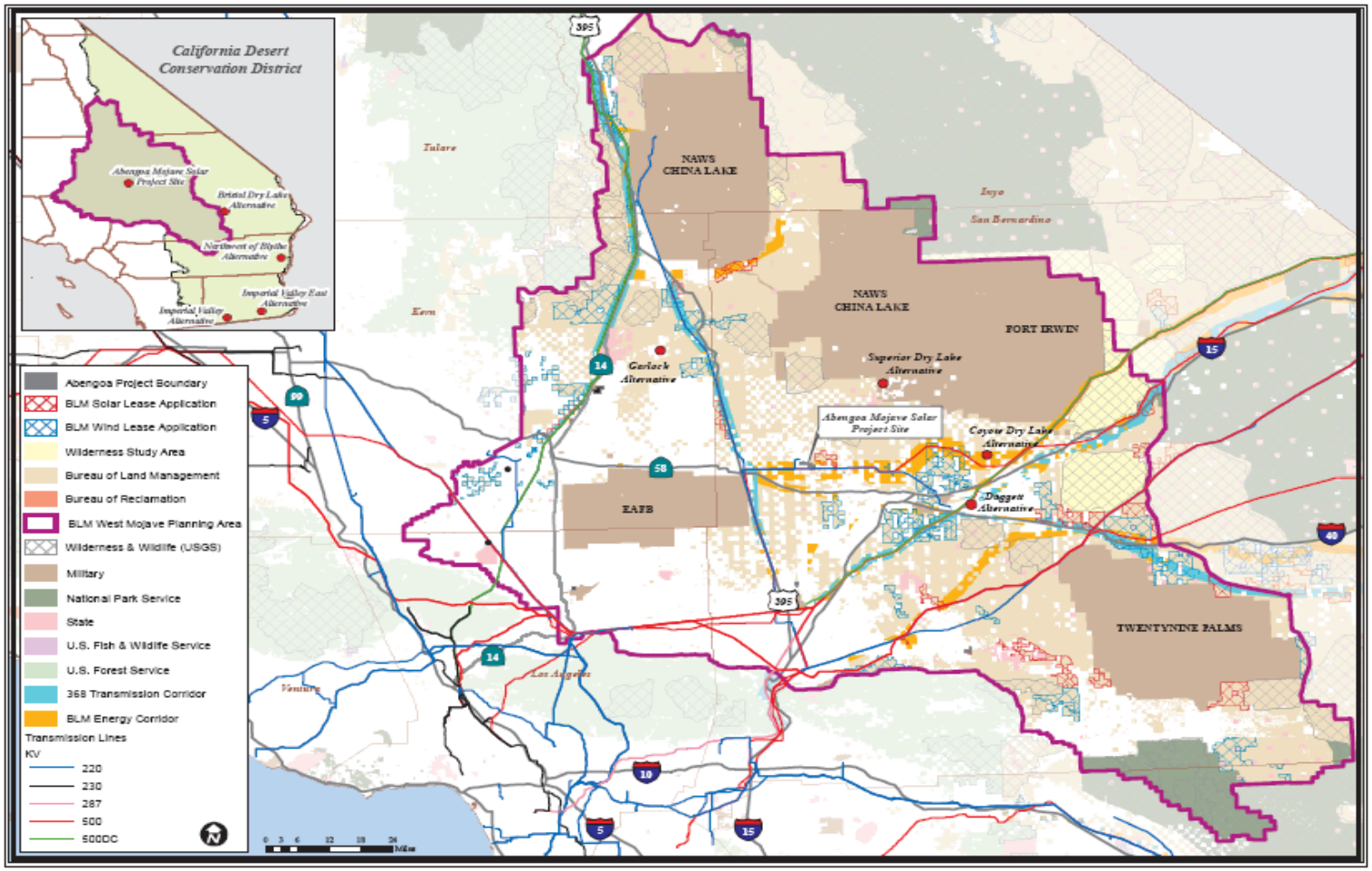
Project Alternatives Figure 1 below shows the location of each site

//

//

//

PROJECT ALTERNATIVES – FIGURE 1
SITE LOCATIONS



Project Alternatives Table 1 below summarizes the grounds on which the Applicant eliminated each alternative site from further consideration.

TABLE 1 - ALTERNATIVE SITE AREAS DROPPED FROM FURTHER ANALYSIS

Alternative Site	Reasons Dropped from Further Analysis
Superior Dry Lake	Lack of consistency with Project Objectives: • Includes BLM land and private land which makes site control difficult/uncertain; lengthy electrical interconnection needed; lengthy natural gas line needed; minimal transportation accessibility. Environmental Impacts: • Large undisturbed areas required for development, increasing the likelihood of biological impacts.
Coyote Dry Lake	Lack of consistency with Project Objectives: • Includes BLM land and private land which makes site control difficult/uncertain; topography less than ideal for development; Environmental Impacts: • Small to medium sized undisturbed areas required for development, increasing the likelihood of biological impacts.
Bristol Dry Lake	Lack of consistency with Project Objectives: • Marginal solar resource; BLM land which makes site control difficult/uncertain; lengthy electrical interconnection needed; minimal transportation accessibility Environmental Impacts: • Large undisturbed areas required for development, increasing the likelihood of biological impacts.
Imperial Valley	Lack of consistency with Project Objectives: • Marginal solar resource; lacks transmission capacity; Environmental Impacts: • Similar disturbed nature of site compared to proposed site; therefore, no environmental advantage when compared to proposed site.
Imperial Valley East	Lack of consistency with Project Objectives: • Marginal solar resource; BLM land which makes sites control difficult/uncertain; lacks transmission capacity. Environmental Impacts: • Large undisturbed areas required for development, increasing the likelihood of biological impacts.
Northwest of Blythe	Lack of consistency with Project Objectives: • BLM land which makes site control difficult/uncertain. Environmental Impacts: • Large undisturbed areas required for development, increasing the likelihood of biological impacts.

Staff independently evaluated the six sites and similarly concluded that the combined impacts to resources and the need for new infrastructure were slightly to significantly greater than that of the selected AMS site. (Ex. 300, pp. 7-5 – 7-9.)

We concur with the determination of Staff and the Applicant.

b. Identified by Staff

Staff identified, evaluated, and rejected two additional possible alternative sites after performing tasks that included:

1) Analyzing maps to identify land that was relatively flat, with sufficient solar insolation for parabolic trough technology.
2) Reviewing the Renewable Energy Transmission Initiative (RETI) Phase 1B and Phase 2A reports to determine the location of competitive renewable energy zones (CREZs) and potential solar projects, as the RETI reports evaluate and rank potential renewable energy sites within California based on certain economic and environmental criteria.
3) Evaluating whether there was high voltage transmission infrastructure (e.g., 230 kV line and substation) within a reasonable distance of an alternative site. Lengthy transmission connections would increase the potential for environmental impacts.
4) Reviewing Desert Tortoise Critical Habitat, Mohave Ground Squirrel Conservation Areas, Desert Wildlife Management Areas, and Areas of Critical Environmental Concern to identifylocations that would not have impacts to desert tortoise, Mohave ground squirrel, or other protected species.
5) Reviewing criteria developed by the environmental community to provide ecosystem level protection to the California Desert Conservation Area. These criteria give preference to disturbed lands, steering development away from lands with high environmental values, and avoiding the deserts' undeveloped cores. (Ex. 300, pp. 7-5 – 7-6.)

The Garlock Road site is generally described as 11 privately-owned parcels comprising 2,000 acres of disturbed private agricultural land near Garlock southwest of Ridgecrest in Kern County. The parcels are owned by six different individuals and range in size from 80 acres to 480 acres. The site is within a valley that drains to Koehn Dry Lake to the west.

This site consists almost exclusively of historic agricultural operations and fallow agricultural fields in a relatively undeveloped area. (Ex. 300, p. 7-9.)

The evidence shows that Staff evaluated environmental impacts likely to result from constructing the AMS project at this site and whether the site could reduce or avoid any potentially significant impacts of the AMS project. Staff concluded that this site and the AMS site would likely have similar impacts to land use, noise and vibration, and soil and water resources. However, unlike the AMS site, Garlock Road would have a greater visual impact by changing the visual character of a currently remote desert location. Cultural resource impacts would also be greater. The Garlock Road site would require a new transmission interconnection, possibly a lengthy reclaimed-water pipeline, as well as trucking to deliver natural gas. The linear features would have the potential for greater visual and biological impacts than at the AMS site, where interconnections would be adjacent to the solar facility. (Ex. 300, pp. 7-10 – 7-13, 7-17.)

The Dagget site is described as a 2,000-acre site comprised of 30 privately-owned parcels. It is situated in a disturbed, developed area in a remote part of the Mojave Desert. It is close to railroads and interstate highways. A low-density residential area is located to the north of the site. The blowsand areas on the site support unique species of insects, plants, and reptiles.

The evidence shows that Staff evaluated the environmental impacts likely to result from constructing the AMS project at the Dagget site and whether the site could reduce or avoid any potentially significant impacts of the AMS project. Staff concluded that this site and the AMS site would potentially have similar impacts to air quality, biological resources, land use, noise and vibration, soil and water resources, and visual resources. However, this site is expected to create greater impacts to cultural resources due to its proximity to historic transportation routes. (Ex. 300, pp. 7-10 – 7-13, 7-17.)

Based on the evidence presented, we conclude that neither the Garlock Road nor the Dagget site present clear advantages over the AMS site.

4. Heat Rejection (Cooling) Technology Alternatives

The AMS project proposes wet cooling and use of about 2,154 acre-feet per year (AFY) of groundwater from onsite wells.

Wet cooling uses circulating water to condense steam turbine exhaust in a shell and tube heat exchanger. Cool circulating water enters the tube side of the condenser where it is warmed by the shell-side steam, causing the steam to condense for condensate pumps to return it to the steam generator feed water system. The warm water then travels to a mechanical-draft wet cooling tower. The cooling tower dissipates heat through circulating water evaporation and

contact with ambient air. Once cooled, the remaining circulating water is returned to the condenser to complete the cooling circuit. Makeup water is added to compensate for the evaporated water.

In contrast, dry cooling uses an air-cooled condenser (ACC) to cool the steam turbine exhaust with a large array of fans that force air over the heat exchangers. Steam is condensed inside the tubes through indirect contact with the ambient air and then forced convection forces heat into the atmosphere. There is no evaporation during the cooling process.

Wet-dry hybrid cooling combines both wet and dry cooling technologies and uses all of the equipment involved in wet cooling and dry cooling. (Hybrid cooling divides the cooling function between the wet and dry systems with the dry cooling system always operating and the wet cooling system handling the remaining cooling load, which varies with environmental and operational conditions. (Exs. (Ex. 1, pp. 4.10-10 - 4.0-11; 300, p. 7-18.)

a. Performance Comparison

The evidence shows that wet cooling technology for the AMS project has performance advantages over dry cooling and wet-dry hybrid cooling. (Exs. 1, p. 4.0-11, 300, pp. 7-17 – 7-18.)

The proposed wet-cooling tower applies water to the outside or the condenser while simultaneously using fans to evaporate the water; the evaporation typically provides approximately a 5-7%t greater efficiency than dry cooling. Moreover, wet-cooling systems can be more efficient than dry cooling in areas with low humidity such as the AMS site because evaporation occurs at the dew point temperature (the air temperature at 100% humidity). Dry cooling does not operate below dry bulb temperatures (ambient air temperature). Dry bulb temperatures are generally much higher than dew point temperatures, especially in regions such as the Mojave Desert. As the dry bulb temperature increases and humidity decreases, the wet cooling system becomes more efficient as a heat rejection method.

Furthermore, the lower condensing temperatures achieved with wet cooling systems result in improved cycle performance. This is because the lower temperatures result in lower steam turbine generator (STG) back-pressures, which increase the STG's generation output. Conversely, the requirement to operate at the higher temperatures and higher STG backpressures associated with dry cooling can adversely affect the AMS project's power output.

Although an expanded solar field and associated facilities could offset the generation loss from dry-cooling, there is evidence that expanding the site footprint would increase impacts to biological resources. (Exs. 1, pp. 4.0-10 – 4.0-12, 300, p. 7-18.)

b. Water Use Comparison

Both dry cooling and wet-dry hybrid cooling would result in reduced water use because a wet-cooling tower relies on evaporation as the primary more of heat rejection, which requires greater consumption of water. The evidence shows that if, for instance, the AMS project used wet-dry hybrid cooling an 80% reduction in required project makeup water would result. (426 AFY vs. 2,154 AFY). (Ex. 1, p. 4.0-14, 300, p. 7-18.)

c. Environmental Impacts Comparison

The evidence shows that dry cooling would have slightly greater impacts to visual resources because an ACC is larger and occupies a bigger footprint than the wet-cooling tower. Dry cooling would involve an ACC structure approximately 130-150 feet in height, which would have greater impacts on visual resources than a wet-cooling tower. A tower of this height is precluded by the 60-feet height restrictions on the site because of the nearby Edwards Air Force Base.

And, because an ACC requires more and larger fans than a wet cooled system, an ACC would produce greater noise emissions than the proposed wet-cooling system. (Ex. 1, p. 4.0-14, 300, p. 7-18.)

The evidence also shows, however, that wet-cooling could have greater impacts than dry cooling to air emissions due to draft emissions and to waste by generating more solid waste than the dry-cooling wastewater process. (Ex. 1, pp. 4.0-11 – 4.0-14, 300, p. 7-18.)

Thus, the evidence shows on balance, that the dry cooling option does not provide a substantial offsetting environmental benefit to the proposed project.

d. Cost Comparison

The Applicant provided a cost impacts analysis for using dry cooling for the AMS project. As shown by **Project Alternatives Table 2** below, the construction and operational costs of dry cooling would result in a net cost increase of $52,230,000. (Ex. 1, p. 4.0-13.)

TABLE 2 - Cost Impacts Associated with Dry Cooling (Based on Entire Project)

Impact Component	Impact (Benefit)
Initial Capital Cost Impacts	
Add ACC, Remove Main Circulating Water System, Reduced Size of Wet-Cooling Tower[1]	$14,550, 000
Increased Steam and Feed Water System Sizes	$13,130,000
Reduced Water/Waste Water Treatment System Sizes	($2,560,000)
Increased HTF Piping, HTF Volume and Associated Systems	$11,590,000
Decrease in Evaporation Pond Size	($1,400,000)
Electrical and I&C System Additions	$1,420,000)
Civil Work	($2,910,000)
Operating Impacts[2]	
Net Generation Impact for Dry Cooling [1,3,4,5,]	$22,630,000
Cost of Water Extraction [4,5]	($910,000)
Cost of Water Treatment (chemicals and consumables)[4,5]	($3,310,000)
Net Impact of Dry Cooling (PV 2010)	$52,230,000

[1] ACC Assumes two 18 bay systems for each Plant; additional sizes were considered with similar results, all resulting in a detrimental cost impact associated with Dry Cooling.

[2] O&M Staffing and maintenance of equipment assumed similar.

[3] Annual net generation for the Dry Cooled design is based on an hour-by-hour study of the Project's output; the same manner used to estimate the Project's output when Wet Cooled. Result is a reduction in performance of 13,500 MWh.

[4] Assumes $0.15/kWH cost of energy.

[5] Assumes 8% Internal Rate of Return (IRR) over a 30-year term to arrive at Present Value (PV) in 2010.

Thus, the Applicant concluded that dry cooling offers no performance or environmental advantages over wet cooling and would be economically unsound. Staff concurred. (Exs. 1, pp. 4.0-10-4.0-15, 48, 300, p.p. 7-17 -7-18.)

The project's conformity with state water policy is discussed in the **Soil and Water Resources** section of this Decision.

5. Alternative Water Supply

Staff and the Applicant considered the use of reclaimed water as an alternative to the project's proposed use of groundwater for project cooling water. They identified three possible entities with existing wastewater treatment facilities, to provide reclaimed water: the City of Barstow (24-25 miles away), the Town of Adelanto (34 miles away), and the Victor Valley Wastewater Reclamation Authority (33 miles away). Applicant submits that each of these potential water suppliers wants groundwater returned to them as potable water. This would require the Applicant to treat the water to make it potable and construct, maintain, and operate a bidirectional pipeline for the project's delivery of potable water. (Exs. 1, pp. 4.0-16 – 4.0-19, 300, p. 7-18.)

Feasibility studies performed by Applicant show that the cost of constructing, operating, and maintaining a one-way supply pipeline to the AMS site ranges from $29 million to $35 million. The corresponding costs of a bidirectional pipeline would be between $54 million and $94 million.

Moreover, the evidence shows that the seasonal supply of reclaimed water from the three above-identified wastewater plants is not aligned with the seasonal demands of the AMS project. To overcome the seasonal variations between supply and demand, the project or the water supplier would need to store approximately 370 AF (121,000,000 gallons) of water each winter for project use in the summer.

The evidence shows that the alternative water supply options do not offer a clear advantage over the proposed AMS water supply and instead, would have greater costs. (Exs. 1, pp. 4.0-16 – 4.0-19, 300, p. 7-17 – 7-18.)

We note that the project's proposed use of groundwater is inconsistent with Energy Commission policy encouraging the efficient use of water resources. However, as discussed in the **Project Description and Soil and Water Resources** sections of this Decision, we find that the project's implementation of various conservation measures will result in water conservation in a manner consistent with water policy

6. Wastewater Disposal

The AMS project will use evaporation ponds for wastewater treatment effluent disposal. Wastewater treatment effluent consists of concentrated brine resulting from several cycles of reuse in the wet cooling tower followed by a series of wastewater treatment processes. As an alternative to the evaporation ponds, the Applicant considered a zero liquid discharge (ZLD) system that would consist of a brine concentrator, a crystallizer, and supporting water treatment equipment such as pumps, tanks, filters, mixing tanks, piping, and a control system. (Exs. 1, p. 4.0-15 -4.0-16, 48, pp. .)

Both evaporation ponds and a ZLD system eliminate wastewater treatment effluent waste. Evaporation ponds do so by using solar energy to evaporate wastewater into the atmosphere, leaving the solids in the pond. In contrast, a ZLD system would concentrate the water treatment effluent stream to produce a wet solid waste product that would require regular offsite truck transport to an appropriately permitted disposal facility. The ZLD system uses an external heat source (e.g., steam or electricity) to evaporate the water. Within the ZLD system, the water removal and crystallization processes occur in closed vessels; the wet solids are removed and stored in containers prior to off-site disposal.

The evidence shows that the Applicant rejected the studied ZLD system after determining that it is neither economically sound for this project nor an environmentally preferable alternative to evaporation ponds. The crystallizer would use steam or electricity from the power plant and/or the power grid due to the cycling nature of the solar plant compared with the more continuous operation of the ZLD system. This would reduce AMS energy output either by reducing the available steam or utilizing electricity. The reduction is expected to be a small fraction of the net plant output in the summer and a more significant percentage in the winter, ultimately reducing the overall net energy produced by the project. Additionally, a ZLD system requires significant amounts of electric power to drive the process in addition to the energy needed to heat the process. These demands can reduce the available electrical output and decrease the overall net efficiency of the power facility. (Ex. 1, p. 4.0-15.)

Neither Staff nor the Applicant identified significant environmental issues as to either wastewater disposal option. Because the ponds would be lined and wildlife impacts would be carefully monitored (and measures would be taken to protect wildlife), potential pond impacts would be minimal. Since the ZLD system crystallizer has minimal potential for groundwater impacts and does not involve

wildlife exposure, groundwater monitoring and wildlife protection measure are unnecessary. (Ex. 1, p. 4.0-15 – 4.0-16.)

Accordingly, in this instance, use of an alternative ZLD system will not provide a clear advantage over the project's use of evaporation ponds.

We note that the project's proposed use of evaporation ponds is inconsistent with Energy Commission policy encouraging the use of ZLD systems that eliminate wastewater discharge and inherently conserve water. However, as discussed in the **Project Description and Soil and Water Resources** sections of this Decision, we find that the project's implementation of various conservation measures will result in water conservation in a manner consistent with water policy

7. Generation Technology Alternatives

a. Alternative Solar Generation Technologies

Staff and the Applicant evaluated other solar generation technologies that have been implemented for utility-scale production. These technologies included photovoltaic (PV), distributed rooftop PV installations, Stirling dish, and distributed power tower. After generally describing the salient features and benefits of each technology, both Staff and Applicant identified disadvantages with each, including increased need for operational water supply (PV), uncertainty regarding economic potential (distributed rooftop PV installations), no clear advantages (Stirling dishes), increased land use and greater visual impacts (distributed power tower). (Exs. 1, pp. 4.0-19 – 4.0-21, 300, pp. 7-18 – 7-22.)

b. Alternative Technologies

Staff also considered other renewable and non-renewable energy sources. Some of the technologies are not fully proven. Others may be applicable, but present no clear advantage over the proposed project. Indeed, a combination of all technologies would be required to meet California's renewable energy goals.

Evidence was also presented on alternative fuels, including oil and natural gas, nuclear, hydroelectric, geothermal, biomass, solar, and wind energy. However, none of these alternatives is feasible due to factors such as inability to meet project objectives (wind, geothermal, biomass), unavailability (hydro, tidal, or wave), environmental impacts (oil and gas or biomass), and/or legal prohibitions (nuclear). (Ex. 300, pp. 7-22 – 7-24.)

8. No Project Alternative

CEQA requires an evaluation of the "No Project" alternative "… to allow decision-makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project." [14 Cal. Code Regs., § 15126.6(e)(1).]

The "No Project" analysis assumes that baseline environmental conditions would not change because the project would not be installed, and that the events or actions reasonably expected to occur in the foreseeable future would occur if the project were not approved. (Ex. 300, pp. 7-24.)

If the project were not built, consumers of the renewable energy from AMS project would not benefit from the annual, solar power this project would provide. A primary benefit of the AMS project is that it would help achieve the State of California objectives mandated by SB 1078 (California Renewable Portfolio Standard Program), and AB 32 (California Global Warming Solutions Act of 2006). In light of these state objectives, and in the absence of the proposed AMS project, other power plants with unknown technologies would likely be constructed in the region to supply the market demand for energy. Furthermore, there may be substantial transmission interconnection delays associated with upgrade requirements if the project were sited elsewhere. Therefore, we find the "No Project" alternative is not a reasonable alternative or a feasible alternative to the AMS project. (Ex. 300, pp. 7-24 - 7-25.)

FINDINGS OF FACT

Based upon the evidence of record, including that presented on each subject area described in other portions of this Decision, we find and conclude as follows:

1. The evidence establishes an acceptable analysis of a reasonable range of alternatives to the AMS project as proposed.
2. The evidentiary record contains an adequate review of alternative sites, linear routings, fuels, technologies, and the "no project" alternative.
3. Alternative fuels and technologies are not capable of meeting the project objectives.

4. No site alternative is capable of meeting the stated project objectives, with the possible exception of the Dagget site. However, the Dagget site offers no clear advantages over the proposed AMS site.

5. The “no project” alternative would not avoid or substantially lessen potentially significant environmental impacts since no unmitigable impacts have been established.

6. The “no project” alternative would not provide electrical system benefits.

7. Without the AMS project, the region and State will not benefit from the clean, renewable source of new generation that the AMS facility will provide.

8. If all Conditions of Certification contained in this Decision are implemented, construction and operation of the AMS project will not create any significant direct, indirect, or cumulative adverse environmental impacts.

CONCLUSION OF LAW

1. We conclude, therefore, that the evidence of record contains a sufficient analysis of alternatives and complies with the requirements of the California Environmental Quality Act, the Warren-Alquist Act, and their respective regulations. No Conditions of Certification are required for this topic.

III. COMPLIANCE AND CLOSURE

Public Resources Code section 25532 requires the Commission to establish a post-certification monitoring system. The purpose of this requirement is to assure that certified facilities are constructed and operated in compliance with applicable laws, ordinances, regulations, standards, as well as the specific Conditions of Certification adopted as part of this Decision.

SUMMARY OF THE EVIDENCE

The record contains a full explanation of the purposes and intent of the Compliance Plan (Plan). The Plan is the administrative mechanism used to ensure that the Abengoa Mohave Solar Project is constructed and operated according to the Conditions of Certification. It essentially describes the respective duties and expectations of the Project Owner and the Staff Compliance Project Manager (CPM) in implementing the design, construction, and operation criteria set forth in this Decision.

Compliance with the Conditions of Certification contained in this Decision is verified through mechanisms such as periodic reports and site visits. The Plan also contains requirements governing the planned closure, as well as the unexpected temporary and unexpected permanent closure, of the Project.

The Compliance Plan is composed of two broad elements. The first element establishes the "General Conditions," which:

- set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
- set forth the requirements for handling confidential records and maintaining the compliance record;
- set forth procedures for settling disputes and making post-certification changes;
- set forth the requirements for periodic compliance reports and other administrative procedures necessary to verify the compliance status of all Commission imposed Conditions; and
- set forth requirements for facility closure.

The second general element of the Plan contains the specific "Conditions of Certification." These are found following the summary and discussion of each individual topic area in this Decision. The individual Conditions contain the measures required to mitigate potentially adverse Project impacts associated with construction, operation, and closure to levels of insignificance. Each Condition also includes a verification provision describing the method of assuring that the Condition has been satisfied.

The contents of the Compliance Plan are intended to be implemented in conjunction with any additional requirements contained in the individual Conditions of Certification.

FINDINGS OF FACT

The record establishes:

1. Requirements contained in the Compliance Plan and in the specific Conditions of Certification are intended to be implemented in conjunction with one another.

2. We adopt the following Compliance Plan as part of this Decision.

CONCLUSIONS OF LAW

1. The compliance and monitoring provisions incorporated as a part of this Decision satisfy the requirements of Public Resources Code section 25532.

2. The Compliance Plan and the specific Conditions of Certification contained in this Decision assure that the Abengoa Mohave Solar Project will be designed, constructed, operated, and closed in conformity with applicable law.

GENERAL CONDITIONS OF CERTIFICATION

DEFINITIONS

The following terms and definitions are used to establish when Conditions of Certification are implemented.

PRE-CONSTRUCTION SITE MOBILIZATION

Site mobilization is limited preconstruction activities at the site to allow for the installation of fencing, construction trailers, construction trailer utilities, and construction trailer parking at the site. Limited ground disturbance, grading, and trenching associated with the above mentioned pre-construction activities is considered part of site mobilization. Walking, driving or parking a passenger vehicle, pickup truck and light vehicles is allowable during site mobilization.

CONSTRUCTION

On-site work to install permanent equipment or structures for any facility.

Ground Disturbance

Construction-related ground disturbance refers to activities that result in the removal of top soil or vegetation at the site beyond site mobilization needs, and for access roads and linear facilities.

Grading, Boring, and Trenching

Construction-related grading, boring, and trenching refers to activities that result in subsurface soil work at the site and for access roads and linear facilities, e.g., alteration of the topographical features such as leveling, removal of hills or high spots, moving of soil from one area to another, and removal of soil.

Notwithstanding the definitions of ground disturbance, grading, boring and trenching above, construction does **not** include the following:

1. The installation of environmental monitoring equipment;
2. A soil or geological investigation;
3. A topographical survey;
4. Any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility; and
5. Any work to provide access to the site for any of the purposes specified in “Construction” 1, 2, 3, or 4 above.

START OF COMMERCIAL OPERATION

For compliance monitoring purposes, “commercial operation” begins after the completion of start-up and commissioning, when the power plant has reached reliable steady-state production of electricity at the rated capacity. At the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager.

COMPLIANCE PROJECT MANAGER RESPONSIBILITIES

The Compliance Project Manager (CPM) shall oversee the compliance monitoring and is responsible for:

1. Ensuring that the design, construction, operation, and closure of the project facilities are in compliance with the terms and conditions of the Energy Commission Decision;

2. Resolving complaints;

3. Processing post-certification changes to the Conditions of Certification, project description (petition to amend), and ownership or operational control (petition for change of ownership) (See instructions for filing petitions);

4. Documenting and tracking compliance filings; and

5. Ensuring that compliance files are maintained and accessible.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies, Energy Commission, and staff when handling disputes, complaints, and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a Condition of Certification requires CPM approval, the approval will involve all appropriate Energy Commission staff and management. All submittals must include searchable electronic versions (pdf or word files).

PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING

The CPM usually schedules pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings is to assemble both the Energy Commission’s and project owner’s technical staff to review the status of all pre-construction or pre-operation requirements, contained in the Energy Commission’s Conditions of Certification. This is to confirm that all applicable Conditions of Certification have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings ensure, to the extent possible, that Energy Commission Conditions will not delay the construction and operation of the plant due to oversight and to preclude any last minute,

unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

ENERGY COMMISSION RECORD

The Energy Commission shall maintain the following documents and information as a public record, in either the Compliance file or Dockets file, for the life of the project (or other period as required):

- All documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
- All monthly and annual compliance reports filed by the project owner;
- All complaints of noncompliance filed with the Energy Commission; and
- All petitions for project or condition of certification changes and the resulting staff or Energy Commission action.

PROJECT OWNER RESPONSIBILITIES

The project owner is responsible for ensuring that the compliance Conditions of Certification and all other Conditions of Certification that appear in the Commission Decision are satisfied. The compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, Conditions of Certification, or ownership. Failure to comply with any of the Conditions of Certification or the compliance conditions may result in reopening of the case and revocation of Energy Commission certification; an administrative fine; or other action as appropriate. A summary of the Compliance Conditions of Certification is included as **Compliance Table 1** at the conclusion of this section of this Decision.

COMPLIANCE CONDITIONS OF CERTIFICATION

Unrestricted Access (COMPLIANCE-1)

The CPM, responsible Energy Commission staff, and delegated agencies or consultants shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the records maintained on-site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time.

Compliance Record (COMPLIANCE-2)

The project owner shall maintain project files on-site or at an alternative site approved by the CPM for the life of the project, unless a lesser period of time is specified by the Conditions of Certification. The files shall contain copies of all

“as-built” drawings, documents submitted as verification for Conditions, and other project-related documents.

Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files maintained pursuant to this Condition.

Compliance Verification Submittals (COMPLIANCE-3)

Each Condition of Certification is followed by a means of verification. The verification describes the Energy Commission’s procedure(s) to ensure post-certification compliance with adopted Conditions. The verification procedures, unlike the Conditions, may be modified as necessary by the CPM.

Verification of compliance with the Conditions of Certification can be accomplished by the following:

1. Monthly and/or annual compliance reports, filed by the project owner or authorized agent, reporting on work done and providing pertinent documentation, as required by the specific Conditions of Certification;

2. Appropriate letters from delegate agencies verifying compliance;

3. Energy Commission staff audits of project records; and/or

4. Energy Commission staff inspections of work, or other evidence that the requirements are satisfied.

Verification lead times associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the project by AFC number, the appropriate Condition(s) of Certification by Condition number(s), and a brief description of the subject of the submittal**. The project owner shall also identify those submittals **not** required by a Condition of Certification with a statement such as: “This submittal is for information only and is not required by a specific Condition of Certification.” When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal and CEC submittal number.

The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such Condition was satisfied by work performed by the project owner or an agent of the project owner.

All hardcopy submittals shall be addressed as follows:

Chris Davis, CPM
(09-AFC-5C)
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814
CMDavis@energy.state.ca.us

Those submittals shall be accompanied by a searchable electronic copy, on a CD or by e-mail, as agreed upon by the CPM.

If the project owner desires Energy Commission staff action by a specific date, that request shall be made in the submittal cover letter and shall include a detailed explanation of the effects on the project if that date is not met.

Pre-Construction Matrix and Tasks Prior to Start of Construction (COMPLIANCE-4)

Prior to commencing construction, a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with the project owner's first compliance submittal or prior to the first pre-construction meeting, whichever comes first. It will be submitted in the same format as the compliance matrix described below.

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction Conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Various lead times for submittal of compliance verification documents to the CPM for Conditions of Certification are established to allow sufficient staff time to review and comment and, if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

Failure to submit compliance documents within the specified lead-time may result in delays in authorization to commence various stages of project development.

If the project owner anticipates commencing project construction as soon as the project is certified, it may be necessary for the project owner to file compliance submittals prior to project certification. Compliance submittals should be completed in advance where the necessary lead time for a required compliance event extends beyond the date anticipated for start of construction. The project owner must understand that the submittal of compliance documents prior to project certification is at the owner's own risk. Any approval by Energy Commission staff is subject to change, based upon the Commission Decision.

Compliance Reporting

There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Energy Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the Conditions of Certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

Compliance Matrix (COMPLIANCE-5)

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide the CPM with the current status of all Conditions of Certification in a spreadsheet format. The compliance matrix must identify:

1. The technical area;
2. The Condition number;
3. A brief description of the verification action or submittal required by the Condition;
4. The date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);
5. The expected or actual submittal date;
6. The date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable; and
7. The compliance status of each Condition, e.g., “not started,” “in progress” or “completed” (include the date).
8. If the Condition was amended, the date of the amendment.

Satisfied Conditions shall be placed at the end of the matrix.

Monthly Compliance Report (COMPLIANCE-6)

The first Monthly Compliance Report is due one month following the Energy Commission business meeting date upon which the project was approved, unless otherwise agreed to by the CPM. The first Monthly Compliance Report shall include the AFC number and an initial list of dates for each of the events identified on the Key Events List found at the end of this section of the Decision.

During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and an electronic searchable version of the Monthly Compliance Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain, at a minimum:

1. A summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;

2. Documents required by specific Conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, as well as the Conditions they satisfy and submitted as attachments to the Monthly Compliance Report;

3. An initial, and thereafter updated, compliance matrix showing the status of all Conditions of Certification;

4. A list of Conditions that have been satisfied during the reporting period, and a description or reference to the actions that satisfied the Condition;

5. A list of any submittal deadlines that were missed, accompanied by an explanation and an estimate of when the information will be provided;

6. A cumulative listing of any approved changes to Conditions of Certification;

7. A listing of any filings submitted to, or permits issued by, other governmental agencies during the month;

8. A projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with Conditions of Certification;

9. A listing of the month's additions to the on-site compliance file; and

10. A listing of complaints, notices of violation, official warnings, and citations received during the month, a description of the resolution of the resolved actions, and the status of any unresolved actions.

All sections, exhibits, or addendums shall be separated by tabbed dividers or as acceptable by the CPM.

Annual Compliance Report (COMPLIANCE-7)

After construction is complete, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the

project unless otherwise specified by the CPM. Each Annual Compliance Report shall include the AFC number, identify the reporting period and shall contain the following:

1. An updated compliance matrix showing the status of all Conditions of Certification (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);

2. A summary of the current project operating status and an explanation of any significant changes to facility operations during the year;

3. Documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, with the condition it satisfies, and submitted as attachments to the Annual Compliance Report;

4. A cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;

5. An explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;

6. A listing of filings submitted to, or permits issued by, other governmental agencies during the year;

7. A projection of project compliance activities scheduled during the next year;

8. A listing of the year's additions to the on-site compliance file;

9. An evaluation of the on-site contingency plan for unplanned facility closure, including any suggestions necessary for bringing the plan up to date [see Compliance Conditions for Facility Closure addressed later in this section]; and

10. A listing of complaints, notices of violation, official warnings, and citations received during the year, a description of the resolution of any resolved matters, and the status of any unresolved matters.

Confidential Information (COMPLIANCE-8)

Any information that the project owner deems confidential shall be submitted to the Energy Commission's Executive Director with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information that is determined to be confidential shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq.

Annual Energy Facility Compliance Fee (COMPLIANCE-9)

Pursuant to the provisions of section 25806(b) of the Public Resources Code, the project owner is required to pay an annual compliance fee, which is adjusted annually. Current Compliance fee information is available on the Energy Commission's website http://www.energy.ca.gov/siting/filing_fees.html. You may also contact the CPM for the current fee information. The initial payment is due on the date the Energy Commission adopts the final decision. All subsequent payments are due by July 1 of each year in which the facility retains its certification. The payment instrument shall be made payable to the California Energy Commission and mailed to: Accounting Office, MS-02, California Energy Commission, 1516 9th St., Sacramento, CA 95814.

Reporting of Complaints, Notices, and Citations (COMPLIANCE-10)

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering with date and time stamp recording. All recorded complaints shall be responded to within 24 hours. The telephone number shall be posted at the project site and made easily visible to passersby during construction and operation. The telephone number shall be provided to the CPM who will post it on the Energy Commission's web page at:

http://www.energy.ca.gov/sitingcases/power_plants_contacts.html

Any changes to the telephone number shall be submitted immediately to the CPM, who will update the web page.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies to the CPM of all complaint forms, including noise and lighting complaints, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** Conditions of Certification. All other complaints shall be recorded on the complaint form located at the end of this section.

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made that provide the flexibility to deal

with the specific situation and project setting that exist at the time of closure. Laws, Ordinances, Regulations and Standards (LORS) pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

There are at least three circumstances in which a facility closure can take place: planned closure, unplanned temporary closure and unplanned permanent closure**.**

CLOSURE DEFINITIONS

Planned Closure

A planned closure occurs when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

Unplanned Temporary Closure

An unplanned temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster or an emergency.

Unplanned Permanent Closure

An unplanned permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unplanned closure where the owner implements the on-site contingency plan. It can also include unplanned closure where the project owner fails to implement the contingency plan, and the project is essentially abandoned.

COMPLIANCE CONDITIONS FOR FACILITY CLOSURE

Planned Closure (COMPLIANCE-11)

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least 12 months (or other period of time agreed to by the CPM) prior to commencement of closure activities. The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.

The plan shall:

1. Identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site;

2. Identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;

3. Identify any facilities or equipment intended to remain on site after closure, the reason, and any future use; and

4. Address conformance of the plan with all applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of facility closure, and applicable Conditions of Certification.

Prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Energy Commission CPM for the purpose of discussing the specific contents of the plan.

In the event that there are significant issues associated with the proposed facility closure plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Energy Commission may hold public hearings as part of its approval procedure.

As necessary, prior to or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities until the Energy Commission approves the facility closure plan.

Unplanned Temporary Closure/On-Site Contingency Plan (COMPLIANCE-12)

In order to ensure that public health and safety and the environment are protected in the event of an unplanned temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety impacts and environmental impacts are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less than 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site

contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days, unless other arrangements are agreed to by the CPM, the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment. (Also see specific Conditions of Certification for the technical areas of Hazardous Materials Management and Waste Management.)

In addition, consistent with requirements under unplanned permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the on-site contingency plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

In the event of an unplanned temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the circumstances and expected duration of the closure.

If the CPM determines that an unplanned temporary closure is likely to be permanent, or for a duration of more than 12 months, a closure plan consistent with the requirements for a planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

Unplanned Permanent Closure/On-Site Contingency Plan (COMPLIANCE-13)

The on-site contingency plan required for unplanned temporary closure shall also cover unplanned permanent facility closure. All of the requirements specified for unplanned temporary closure shall also apply to unplanned permanent closure.

In addition, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the event of abandonment.

In the event of an unplanned permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

A closure plan, consistent with the requirements for a planned closure, shall be developed and submitted to the CPM within 90 days of the permanent closure or another period of time agreed to by the CPM.

Post Certification Changes to the Energy Commission Decision: Amendments, Ownership Changes, Staff Approved Project Modifications and Verification Changes (COMPLIANCE-14)

The project owner must petition the Energy Commission pursuant to Title 20, California Code of Regulations, section 1769, in order to modify the project (including linear facilities) design, operation or performance requirements, and to transfer ownership or operational control of the facility. *It is the responsibility of the project owner to contact the CPM to determine if a proposed project change should be considered a project modification pursuant to section 1769.* Implementation of a project modification without first securing Energy Commission, or Energy Commission staff approval, may result in enforcement action that could result in civil penalties in accordance with section 25534 of the Public Resources Code.

A petition is required for *amendments* and for *Staff approved project modifications* as specified below. Both shall be filed as a "Petition to Amend." Staff will determine if the change is significant or insignificant. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the CPM, who will file it with the Energy Commission's Dockets Unit in accordance with Title 20, California Code of Regulations, section 1209.

The criteria that determine which type of approval and the process that applies are explained below. They reflect the provisions of Section 1769 at the time this Condition was drafted. If the Commission's rules regarding amendments are amended, the rules in effect at the time an amendment is requested shall apply.

Amendment

The project owner shall petition the Energy Commission, pursuant to Title 20, California Code of Regulations, Section 1769(a), when proposing modifications to the project (including linear facilities) design, operation, or performance requirements. If a proposed modification results in deletion or change of a Condition of Certification, or makes changes that would cause the project not to comply with any applicable laws, ordinances, regulations or standards, the petition will be processed as a formal amendment to the Final Decision, which requires public notice and review of the Energy Commission staff analysis, and approval by the full Commission. The petition shall be in the form of a legal brief and fulfill the requirements of section 1769(a). Upon request, the CPM will provide you with a sample petition to use as a template.

Change of Ownership

Change of ownership or operational control also requires that the project owner file a petition pursuant to section 1769 (b). This process requires public notice and approval by the full Commission. The petition shall be in the form of a legal brief and fulfill the requirements of section 1769(b). Upon request, the CPM will provide you with a sample petition to use as a template.

Staff Approved Project Modification

Modifications that do not result in deletions or changes to Conditions of Certification, that are compliant with laws, ordinances, regulations and standards and will not have significant environmental impacts may be authorized by the CPM as a staff approved project modification pursuant to section 1769(a) (2). This process usually requires minimal time to complete, and it requires a 14-day public review of the Notice of Petition to Amend that includes staff's intention to approve the proposed project modification unless substantive objections are filed. These requests must also be submitted in the form of a "petition to amend" as described above.

Verification Change

A verification may be modified by the CPM without requesting an amendment to the Decision if the change does not conflict with the Conditions of Certification and provides an effective alternate means of verification.

CBO DELEGATION AND AGENCY COOPERATION

In performing construction and operation monitoring of the project, Energy Commission staff acts as, and has the authority of, the Chief Building Official (CBO). Energy Commission staff may delegate CBO responsibility to either an independent third party contractor or the local building official. Energy Commission staff retains CBO authority when selecting a delegate CBO, including enforcing and interpreting state and local codes, and use of discretion, as necessary, in implementing the various codes and standards.

Energy Commission staff may also seek the cooperation of state, regional and local agencies that have an interest in environmental protection when conducting project monitoring.

ENFORCEMENT

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Energy Commission Decision. The specific action and amount of any fines the Energy Commission may impose would take into

account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of any laws, ordinances, regulations, or standards, oversight, unforeseeable events, and other factors the Energy Commission may consider.

NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the Conditions of Certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1237, but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by future law or regulations.

Informal Dispute Resolution Process

The following procedure is designed to informally resolve disputes concerning the interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate an informal dispute resolution process. Disputes may pertain to actions or decisions made by any party, including the Energy Commission's delegate agents.

This process may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1237, but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and Conditions of Certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The process encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be brought before the full Energy Commission for consideration via the complaint and investigation procedure.

Request for Informal Investigation

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and Conditions of Certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request

and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter. Within seven working days of the CPM's request, provide a written report to the CPM of the results of the investigation, including corrective measures proposed or undertaken. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to also provide an initial verbal report, within 48 hours.

Request for Informal Meeting

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures proposed or undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within 14 days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

1. Immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;

2. Secure the attendance of appropriate Energy Commission staff and staff of any other agencies with expertise in the subject area of concern, as necessary;

3. Conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner;

4. After the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum that fairly and accurately identifies the positions of all parties and any understandings reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et seq.

Formal Dispute Resolution Procedure-Complaints and Investigations

Any person may file a complaint with the Energy Commission's Dockets Unit alleging noncompliance with a Commission Decision adopted pursuant to Public Resources Code section 25500. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1237.

KEY EVENTS LIST

PROJECT: _____

DOCKET #: _____

COMPLIANCE PROJECT MANAGER: _____

EVENT DESCRIPTION	DATE
Certification Date	
Obtain Site Control	
Online Date	
POWER PLANT SITE ACTIVITIES	
Start Site Mobilization	
Start Ground Disturbance	
Start Grading	
Start Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Combustion of Gas Turbine	
Obtain Building Occupation Permit	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start T/L Construction	
Synchronization with Grid and Interconnection	
Complete T/L Construction	
FUEL SUPPLY LINE ACTIVITIES	
Start Gas Pipeline Construction and Interconnection	
Complete Gas Pipeline Construction	
WATER SUPPLY LINE ACTIVITIES	
Start Water Supply Line Construction	
Complete Water Supply Line Construction	

COMPLIANCE TABLE 1
SUMMARY of COMPLIANCE CONDITIONS OF CERTIFICATION

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-1	Unrestricted Access	The project owner shall grant Energy Commission staff and delegate agencies or consultants unrestricted access to the power plant site.
COMPLIANCE-2	Compliance Record	The project owner shall maintain project files on-site. Energy Commission staff and delegate agencies shall be given unrestricted access to the files.
COMPLIANCE-3	Compliance Verification Submittals	The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed or the project owner or his agent.
COMPLIANCE-4	Pre-construction Matrix and Tasks Prior to Start of Construction	Construction shall not commence until the all of the following activities/submittals have been completed: • property owners living within one mile of the project have been notified of a telephone number to contact for questions, complaints or concerns, • a pre-construction matrix has been submitted identifying only those conditions that must be fulfilled before the start of construction, • all pre-construction conditions have been complied with, • the CPM has issued a letter to the project owner authorizing construction.
COMPLIANCE-5	Compliance Matrix	The project owner shall submit a compliance matrix (in a spreadsheet format) with each monthly and annual compliance report which includes the status of all compliance Conditions of Certification.
COMPLIANCE-6	Monthly Compliance Report including a Key Events List	During construction, the project owner shall submit Monthly Compliance Reports (MCRs) which include specific information. The first MCR is due the month following the Energy Commission business meeting date on which the project was approved and shall include an initial list of dates for each of the events identified on the Key Events List.

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-7	Annual Compliance Reports	After construction ends and throughout the life of the project, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports.
COMPLIANCE-8	Confidential Information	Any information the project owner deems confidential shall be submitted to the Energy Commission's Dockets Unit with a request for confidentiality.
COMPLIANCE-9	Annual fees	Payment of Annual Energy Facility Compliance Fee
COMPLIANCE-10	Reporting of Complaints, Notices and Citations	Within 10 days of receipt, the project owner shall report to the CPM, all notices, complaints, and citations.
COMPLIANCE-11	Planned Facility Closure	The project owner shall submit a closure plan to the CPM at least 12 months prior to commencement of a planned closure.
COMPLIANCE-12	Unplanned Temporary Facility Closure	To ensure that public health and safety and the environment are protected in the event of an unplanned temporary closure, the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.
COMPLIANCE-13	Unplanned Permanent Facility Closure	To ensure that public health and safety and the environment are protected in the event of an unplanned permanent closure, the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.
COMPLIANCE-14	Post-certification changes to the Decision	The project owner must petition the Energy Commission to delete or change a condition of certification, modify the project design or operational requirements and/or transfer ownership of operational control of the facility.

Complaint Log Number:_____ Docket Number:_____

Project Name:_____

COMPLAINT REPORT/RESOLUTION FORM

COMPLAINANT INFORMATION

Name:_____ Phone Number:_____

Address:_____

COMPLAINT

DATE COMPLAINT RECEIVED:_____ TIME COMPLAINT RECEIVED:_____

COMPLAINT RECEIVED BY: ☐ TELEPHONE ☐ IN WRITING (COPY ATTACHED)

DATE OF FIRST OCCURRENCE:_____

DESCRIPTION OF COMPLAINT (INCLUDING DATES, FREQUENCY, AND DURATION):_____

_____

_____

FINDINGS OF INVESTIGATION BY PLANT PERSONNEL:_____

_____

_____

DOES COMPLAINT RELATE TO VIOLATION OF A CEC REQUIREMENT? ☐ YES ☐ NO

DATE COMPLAINANT CONTACTED TO DISCUSS FINDINGS:_____

DESCRIPTION OF CORRECTIVE MEASURES TAKEN OR OTHER COMPLAINT RESOLUTION:_____

_____

_____

DOES COMPLAINANT AGREE WITH PROPOSED RESOLUTION? ☐ YES ☐ NO

IF NOT, EXPLAIN:_____

_____

CORRECTIVE ACTION

IF CORRECTIVE ACTION NECESSARY, DATE COMPLETED:_____

DATE FIRST LETTER SENT TO COMPLAINANT (COPY ATTACHED):_____

DATE FINAL LETTER SENT TO COMPLAINANT (COPY ATTACHED):_____

OTHER RELEVANT INFORMATION:_____

_____

_____

"This information is certified to be correct."

PLANT MANAGER SIGNATURE:_____ DATE:_____

(ATTACH ADDITIONAL PAGES AND ALL SUPPORTING DOCUMENTATION, AS REQUIRED)

IV. ENGINEERING ASSESSMENT

The broad engineering assessment conducted for the AMS project consists of separate analyses that examine facility design, engineering, efficiency, and reliability aspects. These analyses include the on-site power generating equipment and project-related linear facilities.

A. FACILITY DESIGN

This review covers several technical disciplines including the civil, electrical, mechanical, and structural engineering elements related to project design and construction. The evidence was undisputed. (6/28/10 RT 64-76, 81; Exs. 1, 2, 3, 4, 5, 10, 11, 13, 18, 19, 23, 26, 33, 44, 45, 48 [§1], 300, §6.1.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

The AFC describes the preliminary facility design. In considering the adequacy of the plans, the Commission reviews whether the power plant and linear facilities are described with sufficient detail to assure the project can be designed and constructed in accordance with applicable engineering laws, ordinances, regulations, and standards (LORS). The review also includes, as appropriate, the identification of special design features that are necessary to deal with unique site conditions that could impact public health and safety, the environment, or the operational reliability of the project. (Ex. 300 pp. 6.1-2.)

Staff proposed several Conditions of Certification, which we have adopted, that establish a design review and construction inspection process to verify compliance with applicable standards and special requirements. (Ex. 300, pp. 6.1-5 to 6.1-19.) The project will be designed and constructed in conformance with the latest edition of the California Building Standards Code (currently the 2007 CBSC) and other applicable codes and standards in effect at the time design approval and construction actually begin. (Ex. 300, p. 6.1-5.) Condition of Certification **GEN-1** incorporates this requirement.

We considered potential geological hazards and reviewed the preliminary project design with respect to grading, flood protection, erosion control, site drainage, and site access in addition to the criteria for designing and constructing related linear facilities such as the natural gas pipeline and the transmission interconnection facilities. (Ex. 300, § 6.2., see also the **Geology and Paleontology** section of this Decision.) The evidence establishes that the

project will incorporate accepted industry standards. This includes design practices and construction methods for preparing and developing the site. (Ex. 300, p. 6.1-5.) Conditions **CIVIL-1** through **CIVIL-4** ensure that these activities will be conducted in compliance with applicable LORS.

Major structures, systems, and equipment include those structures and associated components necessary for power production and facilities used for storage of hazardous or toxic materials, as well as those capable of becoming potential health and safety hazards if not constructed properly. (Ex. 300, p. 6.1-3.) Conditions **GEN-3** through **GEN-8** require that qualified individuals oversee and inspect construction of the facility. Similarly, Conditions **MECH-1** through **MECH-3** address compliance of the project's mechanical systems with appropriate standards, and a quality assurance/quality control program assures that the AMS project will be designed, procured, fabricated, and installed as described. (Ex. 300, pp. 6.1-16 to 6.1-18.) Condition **ELEC-1** provides that design and construction of major electrical features will comply with applicable LORS. Compliance with design requirements will be verified through specific inspections and audits.

The 2007 California Building Standards Code requires specific "dynamic" lateral force procedures for certain structures to determine their seismic design criteria; others may be designed using a "static" analysis procedure. To ensure that project structures are analyzed appropriately, Condition **STRUC-1** requires the project owner to submit its proposed lateral force procedures to the Chief Building Official (CBO)[4] for review and approval prior to the start of construction. (Ex. 300, p. 6.1-14.)

The evidentiary record also addresses project closure, which may range from "mothballing" the facility to removing all equipment and restoring the site. (Ex. 300, pp. 6.1-4 – 6.1-5.) To ensure that decommissioning of the facility will conform to applicable LORS and be completed in a manner that protects the environment and public health and safety, the project owner is required to submit a decommissioning plan which will identify: decommissioning activities;

[4] The Energy Commission is the CBO for facilities we certify. We may delegate CBO authority to local building officials and/or independent consultants to carry out design review and construction inspections. When CBO duties are delegated, we require a Memorandum of Understanding with the delegate entity to outline respective roles, responsibilities, and qualifications of involved individuals such as those described in Conditions of Certification **GEN-1** through **GEN-8**. (Ex. 300, p. 6.1-3.) The Conditions further require that every appropriate element of project construction be first approved by the CBO and that qualified personnel perform or oversee inspections.

applicable LORS in effect when decommissioning occurs; activities necessary to restore the site, if appropriate; and decommissioning alternatives. (*Id.*) Related requirements are described in the general closure provisions of the Compliance Monitoring and Closure Plan. *See* **General Conditions** in the Compliance section of this Decision.

Overall, the evidentiary record conclusively establishes that the project will be designed and constructed in compliance with all applicable LORS, and that these activities will not negatively impact public health and safety.

FINDINGS OF FACT

Based on the evidence, we make the following findings and reach the following conclusions:

1. The AMS project is currently in the preliminary design stage.

2. The evidentiary record identifies the applicable laws, ordinances, regulations, and standards (LORS) that apply to this project.

3. The evidentiary record contains and independent evaluation of the applicant's proposed design criteria, including identification of criteria essential to public health and safety.

4. The evidentiary record contains sufficient information to establish that the proposed facility can be designed and constructed in conformity with the applicable laws, ordinances, regulations, and standards (LORS) set forth in the appropriate portion of **Appendix A** of this Decision.

5. The Conditions of Certification set forth below provide, in part, that independent qualified personnel will perform design review, plan checking, and field inspections of the proposed project.

6. The Conditions of Certification set forth below are necessary to ensure that the project is designed and constructed both in accordance with applicable law and in a manner that protects environmental quality as well as public health and safety.

7. The **General Conditions,** included in the **Compliance** section of this Decision, establish requirements to be followed in the event of facility closure.

CONCLUSION OF LAW

1. Implementation of the Conditions of Certification listed below will ensure that the AMS project will be designed and constructed in conformance with the applicable laws pertinent to the engineering aspects summarized in **Appendix A** of this Decision.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct, and inspect the project in accordance with the 2007 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval (the CBSC in effect is the edition that has been adopted by the California Building Standards Commission and published at least 180 days previously). The project owner shall ensure that all the provisions of the above applicable codes are enforced during the construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility. All transmission facilities (lines, switchyards, switching stations and substations) are covered in the conditions of certification in the **Transmission System Engineering** section of this document.

In the event that the initial engineering designs are submitted to the CBO when the successor to the 2007 CBSC is in effect, the 2007 CBSC provisions shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

The project owner shall ensure that all contracts with contractors, subcontractors, and suppliers clearly specify that all work performed and materials supplied comply with the codes listed above.

Verification: Within 30 days following receipt of the certificate of occupancy, the project owner shall submit to the CPM a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation, and inspection requirements of the applicable LORS and the Energy Commission's decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the certificate of occupancy within 30 days of receipt from the CBO.

Once the certificate of occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility that requires CBO approval for compliance with the above codes. The CPM will then determine if the CBO needs to approve the work.

GEN-2 Before submitting the initial engineering designs for CBO review, the project owner shall furnish the CPM and the CBO with a schedule of facility design submittals, and master drawings and master specifications list. The master drawings and master specifications list shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures, systems, and equipment. Major structures, systems, and equipment are structures and their associated components or equipment that are necessary for power production, costly or time consuming to repair or replace, are used for the storage, containment, or handling of hazardous or toxic materials, or could become potential health and safety hazards if not constructed according to applicable engineering LORS. The schedule shall contain the date of each submittal to the CBO. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM upon request.

Verification: At least 60 days (or a project owner and CBO approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the schedule, and the master drawings and master specifications list of documents to be submitted to the CBO for review and approval. These documents shall be the pertinent design documents for the major structures, systems, and equipment defined above in Condition of Certification **GEN-2**. Major structures and equipment shall be added to or deleted from the list only with CPM approval. The project owner shall provide schedule updates in the monthly compliance report.

GEN-3 The project owner shall make payments to the CBO for design review, plan checks, and construction inspections, based upon a reasonable fee schedule to be negotiated between the project owner and the CBO, in accordance with the most recently adopted CBC. These fees may be based on hourly rates or the valuation of the facilities reviewed, or may be otherwise agreed upon by the project owner and the CBO.

Verification: The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next monthly compliance report indicating that applicable fees have been paid. A copy of the contract between the project owner and the CBO shall be submitted to the CPM for review.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California- registered architect, or a structural or civil engineer, as the

resident engineer (RE) in charge of the project. All transmission facilities (lines, switchyards, switching stations, and substations) are addressed in the conditions of certification in the **Transmission System Engineering** section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project, respectively. A project may be divided into parts, provided that each part is clearly defined as a distinct unit. Separate assignments of general responsibility may be made for each designated part.

The RE shall:

1. Monitor progress of construction work requiring CBO design review and inspection to ensure compliance with LORS;

2. Ensure that construction of all facilities subject to CBO design review and inspection conforms in every material respect to applicable LORS, these conditions of certification, approved plans, and specifications;

3. Prepare documents to initiate changes in approved drawings and specifications when either directed by the project owner or as required by the conditions of the project;

4. Be responsible for providing project inspectors and testing agencies with complete and up-to-date sets of stamped drawings, plans, specifications, and any other required documents;

5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and

6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests when they do not conform to approved plans and specifications.

The resident engineer (or his delegate) must be located at the project site, or be available at the project site within a reasonable period of time, during any hours in which construction takes place.

The RE shall have the authority to halt construction and to require changes or remedial work if the work does not meet requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or project owner and CBO approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the resume and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval. If the RE or the delegated engineer(s) is subsequently reassigned or replaced, the project owner has five days to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: a civil engineer; a soils, geotechnical, or civil engineer experienced and knowledgeable in the practice of soils engineering; and an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; a mechanical engineer; and an electrical engineer. (California Business and Professions Code section 6704 et seq., and sections 6730, 6731 and 6736 require state registration to practice as a civil engineer or structural engineer in California). All transmission facilities (lines, switchyards, switching stations, and substations) are handled in the conditions of certification in the **Transmission System Engineering** section of this document.

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (for example, proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit, to the CBO for review and approval, the names, qualifications, and registration numbers of all responsible engineers assigned to the project.

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name,

qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A. The civil engineer shall:

1. Review the foundation investigations, geotechnical, or soils reports prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;

2. Design (or be responsible for the design of), stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities requiring design review and inspection by the CBO. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads and sanitary sewer systems; and

3. Provide consultation to the RE during the construction phase of the project and recommend changes in the design of the civil works facilities and changes to the construction procedures.

B. The soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports;

2. Prepare the foundation investigations, geotechnical, or soils reports containing field exploration reports, laboratory tests, and engineering analysis detailing the nature and extent of the soils that could be susceptible to liquefaction, rapid settlement or collapse when saturated under load;

3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with requirements set forth in the 2007 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both); and

4. Recommend field changes to the civil engineer and RE.

This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to the predicted conditions used as the basis for design of earthwork or foundations.

C. The engineering geologist shall:

1. Review all the engineering geology reports and prepare a final soils grading report; and

2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2007 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both).

D. The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;

2. Provide consultation to the RE during design and construction of the project;

3. Monitor construction progress to ensure compliance with engineering LORS;

4. Evaluate and recommend necessary changes in design; and

5. Prepare and sign all major building plans, specifications, and calculations.

E. The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform to all of the mechanical engineering design requirements set forth in the Energy Commission's decision.

F. The electrical engineer shall:

1. Be responsible for the electrical design of the project; and

2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or project owner and CBO approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer and engineering geologist assigned to the project.

At least 30 days (or project owner and CBO approved alternative time frame) prior to the start of construction, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer, and electrical engineer assigned to the project.

The project owner shall notify the CPM of the CBO's approvals of the responsible engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, including prefabricated assemblies, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 2007 CBC. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in conditions of certification in the **Transmission System Engineering** section of this document.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;

2. Inspect the work assigned for conformance with the approved design drawings and specifications;

3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action; and

4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans, specifications, and other provisions of the applicable edition of the CBC.

Verification: At least 15 days (or project owner and CBO approved alternative time frame) prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the

project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next monthly compliance report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend required corrective actions. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this condition of certification and, if appropriate, applicable sections of the CBC and/or other LORS.

Verification: The project owner shall transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next monthly compliance report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. The project owner shall notify the CPM after obtaining the CBO's final approval. The project owner shall retain one set of approved engineering plans, specifications, and calculations (including all approved changes) at the project site or at another accessible location during the operating life of the project. Electronic copies of the approved plans, specifications, calculations, and marked-up as-builts shall be provided to the CBO for retention by the CPM.

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, in the next monthly compliance report, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing the final approved engineering plans, specifications, and calculations described above, the project owner shall submit to the CPM a letter stating both that the above documents have been stored and the storage location of those documents.

Within 90 days of the completion of construction, the project owner shall provide to the CBO three sets of electronic copies of the above documents at the project owner's expense. These are to be provided in the form of "read only" (Adobe .pdf 6.0) files, with restricted (password-protected) printing privileges, on archive quality compact discs.

CIVIL-1 The project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils, geotechnical, or foundation investigations reports required by the 2007 CBC.

Verification: At least 15 days (or project owner and CBO approved alternative time frame) prior to the start of site grading the project owner shall submit the documents described above to the CBO for design review and approval. In the next monthly compliance report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer, geotechnical engineer, or the civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications, and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area.

Verification: The project owner shall notify the CPM within 24 hours, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within 24 hours of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

CIVIL-3 The project owner shall perform inspections in accordance with the 2007 CBC. All plant site-grading operations, for which a grading permit is required, shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and

the CPM. The project owner shall prepare a written report, with copies to the CBO and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a non-conformance report (NCR), and the proposed corrective action for review and approval. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following monthly compliance report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage work, the project owner shall obtain the CBO's approval of the final grading plans (including final changes) for the erosion and sedimentation control work. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans.

Verification: Within 30 days (or project owner and CBO approved alternative time frame) of the completion of the erosion and sediment control mitigation and drainage work, the project owner shall submit to the CBO, for review and approval, the final grading plans (including final changes) and the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes, along with a copy of the transmittal letter to the CPM. The project owner shall submit a copy of the CBO's approval to the CPM in the next monthly compliance report.

STRUC-1 Prior to the start of any increment of construction of any major structure or component described in condition of certification **GEN-2**, above, the project owner shall submit to the CBO for design review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for the following items:

1. Major project structures;

2. Major foundations, equipment supports, and anchorage; and

3. Large field-fabricated tanks.

Construction of any structure or component shall not begin until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;

2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (for example, highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications;

3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation;

4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations, and specifications shall be signed and stamped by the responsible design engineer; and

5. Submit to the CBO the responsible design engineer's signed statement that the final design plans conform to applicable LORS.

Verification: At least 60 days (or project owner and CBO approved alternative time frame) prior to the start of any increment of construction of any structure or component listed in the CBO-approved master drawing and master specifications list, the project owner shall submit to the CBO the above final design plans, specifications and calculations, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM, in the next monthly compliance report, a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and comply with the requirements set forth in applicable engineering LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);

2. Concrete pour sign-off sheets;

3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);

4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and

5. Reports covering other structural activities requiring special inspections shall be in accordance with the 2007 CBC.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies and the proposed corrective action to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the condition(s) of certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 2007 CBC, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give to the CBO prior notice of the intended filing.

Verification: On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the monthly compliance report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in the 2007 CBC shall, at a minimum, be designed to comply with the requirements of that chapter.

Verification: At least 30 days (or project owner- and CBO-approved alternate time frame) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the project owner shall submit to the CBO for design review and approval final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following monthly compliance report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the monthly compliance report following completion of any inspection.

MECH-1 The project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in the CBO-approved master drawing and master specifications list. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of that construction.

The responsible mechanical engineer shall stamp and sign all plans, drawings, and calculations for the major piping and plumbing systems, subject to CBO design review and approval, and submit a signed statement to the CBO when the proposed piping and plumbing systems have been designed, fabricated, and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards, which may include, but are not limited to:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI B31.2 (Fuel Gas Piping Code);
- ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31.8 (Gas Transmission and Distribution Piping Code);
- Title 24, California Code of Regulations, Part 5 (California Plumbing Code);
- Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);
- Title 24, California Code of Regulations, Part 2 (California Building Code); and
- San Bernardino County codes.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of any increment of major piping or plumbing construction listed in the CBO-approved master drawing and master specifications list, the project owner shall submit to the CBO for design review

and approval the final plans, specifications, and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with applicable LORS, and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

The project owner shall transmit to the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of that installation.

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated, and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and

2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications, and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for design review and approval, the above listed documents, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall transmit to the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal-OSHA inspection approvals.

MECH-3 The project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations, and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of that construction. The final plans, specifications and calculations shall include approved criteria, assumptions, and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans, and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for all electrical equipment and systems 480 Volts or higher (see a representative list, below), with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications, and calculations. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in conditions of certification in the **Transmission System Engineering** section of this document.

A. Final plant design plans shall include:

1. One-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems; and

2. System grounding drawings.

B. Final plant calculations must establish:

1. Short-circuit ratings of plant equipment;

2. Ampacity of feeder cables;

3. Voltage drop in feeder cables;

4. System grounding requirements;

5. Coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;

6. System grounding requirements; and

7. Lighting energy calculations.

C. The following activities shall be reported to the CPM in the monthly compliance report:

1. Receipt or delay of major electrical equipment;

2. Testing or energization of major electrical equipment; and

3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission decision.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

B. POWER PLANT EFFICIENCY

Pursuant to the California Environmental Quality Act (CEQA), the Commission must determine whether the consumption of fossil fuel (a non-renewable form of energy) will result in substantial impacts upon energy resources. (Cal. Code Regs., tit. 14 § 15126.4(a)(1), App. F.). However, AMS would use solar energy to generate all of its capacity and fossil fuel, in the form of natural gas, would be used only to maintain steam seals, assist with startups, and keep the temperature of the heat transfer fluid above its relatively high freezing point. The project would decrease reliance on fossil fuel, and would increase reliance on renewable energy resources. The undisputed evidence establishes that the project would not create significant adverse effects on fossil fuel energy supplies or resources, would not require additional sources of energy supply, and would not consume fossil fuel energy in a wasteful of inefficient manner. (Ex. 300, p. 6.3-1.)

The evidence examines the efficiency of the AMS project design, compares project efficiency to that of other solar projects, and examines whether the project will incorporate measures that prevent or reduce wasteful, inefficient, or unnecessary energy consumption. (6/28/10 RT 64-76. 81; Exs. 1, §.1.0; 2.0, 48 [§17], 300, § 6.3.) There are no LORS that establish solar power plant efficiency criteria.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The AMS project is a solar thermal power plant producing a total of 250 MW (nominal net output) and employing the concentrated parabolic trough solar thermal technology. The project would consist of arrays of parabolic mirrors, solar steam generator heat exchangers, two steam turbine generators, and a wet cooling tower (Ex. 1, §§ 1.1, 2.1, 2.4).

The project's power cycle would be based on a steam cycle (also known as the Rankine cycle) (Ex. 1, § 2.4.1). The solar steam generator heat exchangers would receive heat transfer fluid (HTF) from the solar thermal equipment comprised of arrays of parabolic mirrors that collect energy from the sun. The heated HTF would be used to generate steam in the heat exchangers. This steam would then expand through the steam turbine generator to produce electrical power.

The Applicant and Staff evaluated alternative generating technologies to the proposed project. Staff independently concluded that from an energy efficiency prospective, given the project objectives, location, air pollution control requirements, and the commercial availability of various alternative technologies, that the selected solar thermal technology is a feasible selection. This is evaluated in the **Alternatives** section of this Decision. (Ex. 300, pp. 7-19 - 7-24.)

1. Fossil Fuel Use – Impacts

Solar thermal power plants typically consume much less fossil fuel (usually in the form of natural gas) than other types of thermal power plants. Therefore, common measures of power plant efficiency used by the Commission to analyze gas-fired power plants are less meaningful when applied to a solar project. There are currently no legal or industry standards for measuring the efficiency of solar thermal power plants.

AMS would consume insignificant amounts of fossil fuel for power generation. It would consume fossil fuel only to reduce startup time and to keep the temperature of the HTF above its relatively high freezing point. The project would burn natural gas at a nominal rate of approximately 189,000 Million British thermal units (MMBtus) per year (Ex. 1, § 2.4.4.2; 300, p. 6.3-4.). The evidence establishes that compared to a typical fossil fuel-fired power plant of equal capacity, and compared to the relatively considerable resources of fossil fuel in California, this rate is not significant. (Id.) Natural Gas for the AMS project would be supplied from an existing Southern California Gas Company (SGC) pipeline connection. (Ex. 1, §§ 2.4.4.2, 2.5.)

2. Solar Land Use Impacts

Solar power plants do occupy vast tracts of land and therefore, the focus for analyzing the efficiency of these types of facilities must shift from fuel efficiency to land use efficiency. To analyze the land use efficiency of a solar facility, Staff analyzed the AMS project to determine its overall solar efficiency. The greater the project's solar efficiency, the less land the plant must occupy to produce a given power output. (Ex. 300, p. 6.3-5.)

The extent of the project's land use impacts is likely in direct proportion to the number of acres affected. For this reason, we evaluated the land use efficiency of the project and expressed the results in terms of power produced, or MW per acre. We evaluated the project as compared to the MW per acre of other solar projects currently under review by the Commission. These projects' power and

energy output, and the extent of the land occupied by them, are summarized in **Efficiency Table 1**, below. The solar land use efficiency for a typical fossil fuel-fired (natural gas-fired) combined cycle power plant is shown only for comparison. (Ex. 300, p. 6.3-5.)

According to the Staff analysis, the AMS will produce power at the rate of 250 MW net, and will generate energy at the rate of 630,000 MW-hours net per year, while occupying approximately 1,684 acres (Ex. 1. § 2.3, Figure 2-4). Staff calculations for the AMS establish:

Power-based efficiency: 250 MW ÷ 1,420 acres = **0.18 MW/acre** or **5.7 acres/MW**

Staff calculates energy-based land use efficiency thus:

Energy-based efficiency: 630,000 MWh/year ÷ 1,420 acres =**444 MWh/acre-year**

//

//

//

Efficiency Table 1 — Solar Land Use Efficiency

Project	Generating Capacity (MW net)	Annual Energy Production (MWh net)	Annual Fuel Consumption (MMBtu LHV)	Footprint (Acres)	Land Use Efficiency (Power-Based) (MW/acre)	Land Use Efficiency (Energy – Based) (MWh/acre-year)	
						Total	Solar Only[2]
AMS (09-AFC-5)	**250**	**630,000**	**94,280**	**1,420**	**0.18**	**444**	**434**
Beacon Solar (08-AFC-2)	250	600,000	36,000	1,321	0.19	454	450
Ivanpah SEGS (07-AFC-5)	400	960,000	432,432	3,744	0.11	256	238
Calico Solar (08-AFC-13)	850	1,840,000	0	8,200	0.11	224	224
SES Solar Two (08-AFC-5)	750	1,620,000	0	6,500	0.12	249	249
Solar Millennium Blythe (09-AFC-6)	1,000	2,100,000	207,839	5,950	0.17	353	348
Solar Millennium Palen (09-AFC-7)	500	1,000,000	103,919	2,970	0.17	337	332
Genesis Solar (09-AFC-8)	250	600,000	60,000	1,800	0.14	333	329
Solar Millennium Ridgecrest (09-AFC-9)	250	500,000	51,960	1,440	0.17	347	342
Avenal Energy (08-AFC-1)[3]	600	3,023,388	24,792,786	25	24.0	120,936	N/A

[2] Net energy output is reduced by natural gas-fired combined cycle proxy energy output; see **Efficiency Appendix A**.

[3] Example natural gas-fired combined cycle plant.

As seen in **Efficiency Table 1** above, the AMS project's use of linear parabolic trough technology is roughly 25 percent more efficient in use of land than the Ivanpah SEGS project, which employs BrightSource power tower technology, and 30 percent more efficient than the Stirling Energy Systems Solar Two project. (Ex. 300, p. 6.3-6.)

Based on the evidence, we make the following findings and reach the following conclusions:

FINDINGS OF FACT

1. AMS will provide approximately 250 MW of electrical power, using solar energy to generate most of its capacity and natural gas auxiliary boilers to maintain steam seals, reduce startup time, and to keep the temperature of the heat transfer fluid above its freezing point.

2. The project will burn natural gas at a nominal rate of approximately 189,000 Million British thermal units (MMBtus) per year.

3. Compared to the project's expected overall production rate and compared to a typical fossil fuel fired power plant of equal capacity, the amount of the annual power production from fossil fuel is insignificant.

4. The evidence contains a comparative analysis of alternative fuel sources and generation technologies, none of which is superior to the proposed project at meeting project objectives in an efficient manner.

5. The impact of the project's fuel consumption on energy supplies and energy efficiency is less than significant.

6. AMS will not require the development of new fuel supply resources.

7. The project will decrease reliance on fossil fuel and will increase reliance on renewable energy resources. Consequently, the project would help in reducing California's dependence on fossil fuel-fired power plants.

8. The evidentiary record contains an analysis of the project's land use impacts compared to energy output, and analyses of alternative solar technologies and heat rejection systems.

9. The project will occupy approximately 5.7 acres per MW of power output, a figure lower than many other solar power technologies.

10. No nearby power plant projects or other projects consuming large amounts of fossil fuel hold the potential for cumulative energy consumption impacts when aggregated with the project.

11. No Federal, State, or local laws, ordinances, regulations, or standards apply to the efficiency of this project.

CONCLUSIONS OF LAW

1. The Abengoa Mojave Solar Project will not create adverse effects upon energy supplies or resources, require additional sources of energy supply, or consume energy in a wasteful or inefficient manner.

2. No Conditions of Certification are required for this topic area.

C. POWER PLANT RELIABILITY

In order to ensure safe and reliable operation of the AMS project, we must determine whether the project will be appropriately designed and sited. [Pub. Res. Code, § 25520(b); Cal. Code Regs., tit. 20, § 1752(c)(2).] However, there are no LORS that establish either power plant reliability criteria or procedures for attaining reliable operation.

The responsibility for maintaining system reliability falls largely to control area operators such as the California Independent System Operator (CAISO) that purchase, dispatch, and sell electric power throughout the State. (Ex. 300, p. 5.4-1.) Protocols to ensure sufficient electrical system reliability have been established. For example, "must run" power purchase agreements and "participating generator" agreements are two mechanisms that contribute to an adequate supply of reliable power. (Ex. 300, p. 6.4-2.)

The California Public Utilities Commission consults with CAISO to establish resource adequacy requirements for all load-serving entities (basically, publicly and privately owned utility companies). These requirements include maintaining a minimum reserve margin (extra generating capacity to serve in times of equipment failure or unexpected demand) and maintaining sufficient local generating resources to satisfy the load-serving entity's peak demand and operating reserve requirements. The CAISO has begun to establish specific criteria for each load-serving entity under its jurisdiction. These criteria guide each load-serving entity in deciding how much generating capacity and ancillary services to build or purchase, after which the load-serving entity issues power purchase agreements to satisfy these needs. (*Id*.)

According to the evidence, summarized below, these criteria have been developed on the assumption that individual power plants in the current competitive market will continue to exhibit historical reliability levels. However, it is possible that, if numerous power plants operated at reliability levels sufficiently lower than historical levels, this assumption would prove invalid. Therefore, to ensure adequate system reliability, we examine whether individual power plants will be built and operated to the traditional level of reliability reflected in the power generation industry. We take this approach because, where a power plant compares favorably to industry norms, it is not likely to degrade the overall reliability of the electric system it serves. (Ex. 300, pp. 6.4-2 to 6.4-3.)

The evidence presented on this topic was undisputed. (6/28/10 RT 64-76, 81, Exs.1, Appendix J, 3, 48 [§ 18], 300, §6.4.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

Applicant intends that the AMS project provide dependable renewable power to the electricity grid, generally during the hours of peak power consumption such as hot summer afternoons. It expects an annual availability factor[5] of approximately 95 percent for the project. (Ex. 300, p. 6.4-2.) Both planned and unplanned outages subtract from a plant's availability. For practical purposes, a reliable power plant is one that is available when called upon to operate. The evidence shows that delivering acceptable reliability entails: 1) adequate levels of equipment availability; 2) plant maintainability with scheduled maintenance outages; 3) fuel and water availability; and 4) resistance to natural hazards. (Ex. 300, p. 6.4-3.)

The record, summarized below, reflects Staff's evaluation of the proposed project against typical industry norms as a benchmark for assessing plant reliability.

1. Equipment Availability

Equipment availability will be ensured by use of appropriate quality assurance/quality control (QA/QC) programs during design, procurement, construction, and operation of the plant and by providing adequate maintenance and repair of the equipment and systems. The project owner will use a QA/QC program typical in the power industry. Equipment will be purchased from qualified suppliers and the project owner will perform receipt inspections, test components, and administer independent testing contracts. To ensure these measures are taken, we have incorporated appropriate Conditions of Certification in the **Facility Design** section of this Decision. (Ex. 300, p. 6.4-3.)

2. Plant Maintainability

The AMS project will operate only when the sun is shining. Repairs or maintenance can thus occur at night. Moreover, redundant pieces of the equipment most likely to require service or repair will be provided in order to allow repairs when the plant is operating, if needed. (Ex. 300, pp.6.4-3 to 6.4-4.)

[5] This is the percentage of time that the power plant is available to generate power.

The project owner will establish a maintenance program based on recommendations from the various equipment manufacturers. This will encompass both preventive and predictive maintenance techniques. Maintenance outages will likely be planned for periods of low electricity demand. The evidence establishes that these measures will ensure acceptable reliability. (Ex. 300, p. 6.4-4.)

3. Fuel and Water Availability

For any power plant the long-term availability of fuel, and water for cooling or process use, is necessary to ensure reliability. The AMS project will use small amounts of natural gas to reduce start-up time and keep the temperature of the heat transfer fluid above its freezing point. This fuel will be supplied by an existing pipeline connecting to the Southwest Gas Corporation system that was installed to support the existing SEGS projects at Harper Lake. The evidence establishes that adequate supplies of natural gas are available to meet the project's needs. (Ex. 300, p. 6.4-4.)

The Applicant proposes to use well water for domestic and industrial water needs, including steam cycle makeup, mirror washing, service water and fire protection water. (Ex. 300, pp. 6.4-4 to 6.4-5.) As discussed in the **Soil and Water Resources** section of this Decision, the evidence establishes there is a sufficient, reliable water supply.

4. Natural Hazards

The site is located in an active geologic area of the north-central Mojave Desert geomorphic province in southwest San Bernardino County, California. The project will be designed and constructed to standards of the latest appropriate LORS. By implementing these seismic design criteria, this project will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. We have adopted Conditions of Certification in the **Facility Design** section to ensure this occurs. Although a portion of the site is within the 100-year floodplain, evidence provides no special concerns with power plant reliability due to flooding. (Ex. 300, p. 6.4-5.)

5. Comparison to Industry Norms

The North American Electric Reliability Corporation (NERC) maintains industry statistics for availability factors and other related reliability data. However, no

statistics are currently available for solar power plants. The record therefore contains a comparison of the project's predicted availability factor of fossil-fueled plants.[6] (Ex. 300, pp. 6.4-5 to 6.4-6.) NERC reports that, for the years 2002-2006, the availability factor for fossil fueled units is 86.01 percent. (Ex. 300, p. 6.4-6.)

Moreover, the evidence shows that the concentrated parabolic trough solar thermal technology is not new. It has been employed for over 20 years at the nearby SEGS facilities in the Mojave Desert. The AMS project will also use multi-pressure condensing steam turbine technology. Steam turbines incorporating this technology have been on the market for many years and typically exhibit high availability. Furthermore, because solar-generated steam is cleaner than burnt fossil fuel, the steam cycle units will likely require less frequent maintenance than units that burn fossil fuel. (Ex. 300, p. 6.4-6.) We are persuaded by the evidence that the project will likely reach its predicted annual availability factor of approximately 96 percent.

Finally, the evidence shows that the AMS project will provide renewable energy on hot summer afternoons, when it is most needed. The evidence characterizes this as a "noteworthy project benefit." (Ex. 300, p. 6.4-6.)

FINDINGS OF FACT

Based on the evidence, we make the following findings:

1. No federal, state, or local/county LORS apply to the reliability of the AMS project.

2. A project's reliability is acceptable if it does not degrade the reliability of the utility system to which it is connected.

3. No NERC statistics for solar power plants are currently available. Therefore, the evidence contains a comparison of the project's predicted availability factor to the average availability factor of fossil-fueled plants.

4. The NERC reports that, for the years 2002 through 2006, fossil-fueled units of 200-299 MW exhibited an availability factor of about 86.01 percent.

[6] Because the project's total net power output is 250 MW, Commission staff used the availability factor statistics for 200-299 MW fossil fueled units. (Ex. 300, p. 6.4-6.)

5. An availability factor approximately 95 percent is achievable by the AMS project.

6. AMS is anticipated to operate at an annual capacity factor of approximately 27 percent.

7. Implementation of Quality Assurance/Quality Control (QA/QC) programs during design, procurement, construction, and operation of the plant, as well as adequate maintenance and repair of the equipment and systems, will ensure the project is adequately reliable.

8. Appropriate Conditions of Certification included in the **Facility Design** portion of this Decision ensure implementation of the QA/QC programs and conformance with seismic design criteria.

9. The project's natural gas fuel supply is reliable.

10. The evidence shows that adequate, reliable supplies of water exist and are available.

11. The project will meet or exceed industry norms for reliability, including reliability during seismic events, and will not degrade the overall electrical system.

12. The project will incorporate an appropriate redundancy of function for its equipment.

13. The nature of solar thermal generating technology provides inherent redundancy because the series-parallel arrangement of solar collector assemblies would allow for reduced output generation if one (or possible several) rows of solar collectors were to require service or repair.

14. The project will provide renewable energy on hot summer days, when it is most needed.

CONCLUSIONS OF LAW

1. We therefore conclude that the AMS project will meet or exceed industry norms and not degrade the overall reliability of the electrical system.

2. There are no LORS that establish either power plant reliability criteria or procedures for attaining reliable operation. No Conditions of Certification are required for this topic area.

D. TRANSMISSION SYSTEM ENGINEERING

The Commission's jurisdiction includes ". . . any electric power line carrying electric power from a thermal power plant . . . to a point of junction with an interconnected transmission system." (Pub. Res. Code § 25107.) In conducting its review of a power plant AFC, the Commission assesses the engineering and planning design of new transmission facilities associated with a proposed project to ensure compliance with applicable LORS required for safe and reliable electric power transmission. We must evaluate the power plant switchyard, outlet line, termination and downstream facilities identified by the applicant. Additionally, under the CEQA, the Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission. (Cal. Code Regs., tit. 14, § 15378.) Thus, the Commission must identify the system impacts and necessary new or modified transmission facilities required downstream of the proposed interconnection. The record indicates that the Applicant in this case has adequately identified all necessary interconnection facilities based on the information currently available.

The AMS project will interconnect to the Southern California Edison (SCE) system at the proposed new Lockhart 230-kV substation. SCE is responsible for ensuring electric system reliability in the SCE system for addition of a new generating plant. SCE will provide the analysis and reports in their System Impact and Facilities Studies, and identify facilities and changes required in their system for addition of any new project-related transmission modifications.

The California Independent System Operator (CAISO) is responsible for ensuring electric system reliability for participating entities and determines both the standards necessary to achieve system reliability and whether a proposed project conforms to those standards. The Energy Commission works in conjunction with the CAISO in assessing a project. Commission staff normally relies on the CAISO, or the interconnecting utility (in this case SCE) for the analysis of impacts on the transmission grid as well as the identification and approval of required new or modified facilities downstream from the proposed interconnection. The CAISO will review the System Impact Study (SIS) performed by SCE and/or any third party and provide their recommendations. On satisfactory completion of the SCE Interconnection Facility Study (IFS)/Technical Assessment Study (TAS) and in accordance with the provisions of the CAISO Large Generator Interconnection Process (LGIP), CAISO will execute a Large Generator Interconnection Agreement (LGIA) between the CAISO and the project owner. Condition of Certification **TSE-5 G** requires that

the project owner provide the executed LGIA to the Energy Commission before starting construction on any transmission facilities.

The analysis of record evaluated the power plant switchyard, outlet line, termination, and downstream facilities identified by the Applicant. The record also includes Conditions of Certification to ensure the project complies with applicable laws during the design review, construction, operation, and potential closure of the project. No evidence of record disputes these matters. (6/28/10 RT 64-76, 81, 7/15/10 RT 12-13, Exs. 1, Appendixes J and N, 2, 3, 18, 26, 27, 28, 48 [§19.0],303, §6.5, Appendix A.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Transmission Facilities Description

The AMS project would have two independent solar fields, Alpha and Beta, each feeding a 125 MW power island with a solar steam generator to operate a steam turbine generator (STG). The project would have a total 250 MW nominal output with two 125 MW STG units. Each STG unit rated 165 Megavolt Ampere (MVA), 13.8 Kilovolt (kV). These units would be connected through an 8,000-ampere segregated bus duct to the low voltage terminal of a dedicated 148/175 MVA, 13.8/230 kV generator step-up (GSU) transformer with an impedance of 9 percent @148 MVA. (Exs. 1, 2, 303, pp. 6.5-4 6.5-5.)

The new Alpha and Beta 230 kV switchyards would have a 1,200-ampere single bus arrangement. The 230 kV high voltage terminals of each GSU transformer at the Alpha and Beta solar fields would be connected to its switchyard 230 kV bus by short 700-ampere overhead conductors through a 1,200-ampere, 230 kV circuit breaker and two disconnect switches. (*Id*.)

The Alpha and Beta switchyards would be interconnected to the SCE Kramer-Cool Water No. 1 230 kV line by building a new SCE Lockhart 230 kV substation located at the southern fence line of the Beta solar field and looping the existing Kramer-Cool Water No. 1 230 kV line into the new substation. (Ex. 303, p. 6.5-5.)

The Alpha switchyard would be interconnected to Lockhart substation by building a new 2.17-mile long single circuit 230 kV overhead line with 477 kcmil steel-reinforced aluminum conductors (ACSR) on 80 to 110-foot steel poles within the plant boundary. The Beta switchyard would be interconnected to Lockhart

substation by building a new 0.84-mile long single circuit 230 kV overhead line with 477 kcmil ACSR conductors on 80 to 110-foot steel poles within the plant property. The generator tie lines would be connected to their respective Alpha and Beta 230 kV switchyard bus through a 1,200-ampere disconnect switch. The Applicant would build, own and operate the AMS Alpha and Beta switchyards and the generator tie lines. (Exs.1, Appendixes J and N, 2, 303, p. 6.5-5.)

The undisputed evidence contained in the record establishes that the configuration of the AMS Alpha and Beta 230 kV switchyards, the generator 230 kV overhead tie lines and their terminations at the proposed new Lockhart 230 kV substation would be adequate in accordance with industry standards and good utility practices. We therefore find the proposed facilities acceptable. Proposed Conditions of Certification **TSE-1 to TSE-8** will ensure that the facilities are designed, built and operated in accordance with good utility practices and applicable LORS.

2. Transmission System Impacts Analysis

For the interconnection of a proposed generating unit or transmission facility to the grid, the interconnecting utility and the control area operator are responsible for ensuring grid reliability. For the AMS, SCE and CAISO are responsible for ensuring grid reliability. In accordance with the FERC/CAISO/Utility Tariffs, System Impact and Interconnection Facilities Studies are conducted to determine the preferred and alternate methods of interconnecting the project to the grid. The studies also examine the downstream transmission system impacts and the mitigation measures needed to ensure system conformance with performance levels required by the utility reliability criteria, NERC planning standards, WECC reliability criteria, and CAISO reliability criteria. The Commission relies on the studies and any other review conducted by the responsible agencies to determine the effect of the project on the transmission grid. These studies also identify any necessary downstream facilities or project impacts required to bring the transmission network into compliance with applicable reliability standards. (Ex. 303, p. 6.5-6.)

Both the System Impact Study and the Interconnection Facilities Studies/Technical Assessment Study analyze the grid with and without the proposed project under conditions specified in the planning standards and reliability criteria. The standards and criteria define the assumptions used in the study and establish the thresholds by which grid reliability is determined. The studies must analyze the impact of the project for the proposed first year of operation and thus are based on a forecast of loads, generation and

transmission. Load forecasts are developed by the interconnected utility, which is SCE in this case. Generation and transmission forecasts are established by an interconnection queue. The studies are focused on thermal overloads, voltage deviations, system stability (excessive oscillations in generators and transmission system, voltage collapse, loss of loads or cascading outages), and short circuit duties. SCE completed the System Impact Study in June 2008 and the Interconnection Facilities Study in October 2009. (Ex. 303, p. 6.5-6.)

If the studies show that the interconnection of the project causes the grid to be out of compliance with reliability standards, the studies will then identify mitigation alternatives or ways in which the grid could be brought into compliance with reliability standards. If the interconnecting utility determines that the only feasible mitigation includes transmission modifications or additions that require CEQA review as part of the "whole of the action," the Energy Commission must analyze those modifications or additions according to CEQA requirements.

The Interconnection Facilities Study/Technical Assessment Study demonstrates that the addition of the AMS would cause new normal (N-0) and single contingency (N-1) overloads on the Kramer-Lugo No. 1 & No. 2 230 kV lines during 2013 summer peak and light spring system conditions. The study also identified transient stability violation for loss of the Lugo-Cool Water 230 kV line. The current mitigation plan responsibility for the AMS includes two alternatives. The alternative 1 mitigation plan involves building a new 59-mile Cool Water-Lugo 230 kV line, and installation of a new Special Protection System (SPS) for curtailment of the AMS generation under certain outage and other conditions. The alternative 2 mitigation plan includes congestion management, installation of a new SPS for curtailment of the AMS generation output and participation in the existing Kramer Remedial Acton Scheme (RAS) for associated curtailments in lieu of installation of the proposed Cool Water-Lugo 230 kV line.(Ex. 303, pp. 6.5-7 – 6.5-8.)

The Applicant has chosen the alternative 2 mitigation plan which involves installation of a telecommunication system using multi-stranded fiber optic cables and other communication equipment, which would be installed in the following routes:

- Lockhart substation to Alpha & Beta switchyards-about 3 miles.
- Lockhart substation to Kramer substation-about 18 miles.
- Lockhart substation to Tortilla substation-about 31 miles.

- Tortilla substation to Cool Water substation-about 12 miles.
- Kramer substation to Victor substation-about 36 miles. (Ex. 303, pp. 6.5-10 – 6.5-12.)

The new fiber optic cables for a total length of approximately 100 miles of the combined routes would be installed partly on the existing overhead transmission (115 kV) and distribution (33 kV) wood and steel poles, partly on new wood poles, and partly through new and existing underground conduits. The installation of the proposed fiber optic cables is considered a downstream project impact.

The record includes Staff's analysis of downstream upgrades and related impacts. (Ex. 303, Appendix A.) The evidence establishes that the downstream facilities would be designed, built, and operated by SCE. The California Public Utilities Commission would be the CEQA lead agency and either the Bureau of Land Management of the U.S. Department of Energy would be NEPA lead agencies for the permitting and licensing of these facilities.

SCE has provided a planning-level description of the Lockhart Substation and associated facilities. Site-specific engineering and design document will be provided at a later date. Thus, Staff prepared a screening level analysis to inform of the potential environmental and public health effects caused by interconnection of the AMS project to the SCE transmission system. In summary, Staff's evaluation encompassed the topics that included but were not limited to quality, visual resources, biological resources, cultural resources, geology and paleontology, resources, hazardous waste, land use, noise and vibration, traffic and transportation, socioeconomics, soil and water resources, waste management, and visual resources. (Ex. 303, Appendix A.)

Based on the evidence and analysis presented, we find that the downstream upgrades will not impact facility design, power plant efficiency, power plant reliability, and transmission line safety and nuisance. Although there might be environmental impacts in other technical areas, we anticipate those impacts being less than significant with implementation of the Conditions of Certification set forth throughout this Decision. We recognize, however, that additional mitigation measures might be required by the CPUC and BLM or DOE as the project design is further refined. (Id.)

The Applicant has signed a power purchase agreement with Pacific Gas and Electric for renewable power supply. The AMS as a solar generation would provide clean renewable energy towards meeting state mandate and goals.

3. Cumulative Impacts

The AMS is being connected to the north of Lugo SCE area. Several major transmission upgrades for the reliable interconnection of both the AMS and other generators with higher queue positions will be necessary. As a result, the AMS would create some cumulative effects in the SCE local network under certain conditions until all the identified transmission facilities are in place.

There will be cumulative impacts due to the AMS, as identified in the SIS or IFS. Nevertheless, these impacts would be mitigated. In addition, we find that, based on the evidence, there would be some positive impacts since this solar project would provide clean renewable energy, meet the increasing load demand in the SCE network, provide additional reactive power and voltage support, and enhance reliability in the SCE local network.

4. Alternative Transmission Routes

The evidence also contains an examination of potential alternative transmission routes. The Applicant did not choose to interconnect to the Los Angeles Department of Water and Power (LADWP) line alternative. That alternative would involve multiple owners, increased interconnection costs, uncertainty, and complexity and would be harder to ensure delivery of the project to the CAISO grid. The interconnection to the SCE system would ensure earlier interconnection and power delivery to the CAISO grid and would follow the shortest, least expensive routes within the AMS site with least environmental impacts. (Exs. 1, § 4.5; 300, p. 6.5-10.)

5. Public and Agency Comment

Staff received comments from SCE in a letter dated April 15, 2010 indicating that the Staff Assessment did not include a complete environmental analysis of the interconnection facilities at the Lockhart substation and that Staff's description of the Lockhart substation facilities was not accurate. Staff replied that it reviewed SCE's general environmental analysis report in the Draft, "Lockhart Substation Project Description for Abengoa Solar Inc." dated March 15, 2010, which does not discuss the relocation of 50 kV lines in or around the Lockhart Substation. Staff at this stage has no further information about any other new or existing facilities near the project site which would need to meet CEQA requirements. Staff further asserted that it updated the project description in Supplemental Staff Assessment Part C and to state that the proposed Lockhart 230 kV substation

would have 3 switch bays and seven circuit breakers along with associated disconnect switches. (Ex. 303, p. 6.5-12.)

On July 14, 2010, SCE asked Staff to verify that Supplemental Staff Assessment Part C included the current project description of the Lockhart Substation and its associated telecommunications routes. In its written reply to SCE, Staff affirmed that Staff's supplemental analysis is based on the SCE Lockhart Substation Project Description for Abengoa Solar Inc., dated April 15. 2010. Staff further affirmed that this description was the basis for Staff's document entitled Appendix to Transmission System Engineering Congestion Management and Telecommunication System Impact Analysis.

Based on our review of the record, Staff did in fact use the updated project description for its supplemental analysis.

FINDINGS OF FACT

Based on the uncontroverted evidence of record, the Commission makes the following finding:

1. The proposed interconnection facilities including the generator connections through an 8,000-ampere segregated bus duct to the low voltage terminal of a dedicated 148/175 MVA, 13.8/230 kV generator step-up (GSU) transformer, the configuration of the AMS Alpha and Beta 230 kV switchyards, the generator 230 kV overhead tie lines, and their terminations at the proposed new Lockhart 230 kV substation, would all be adequate in accordance with NESC standards, GO-95 Rules, industry standards, and good utility practices, and are acceptable according to engineering LORS contained in **Appendix A**.

2. The record includes a System Impact Study (SIS) which analyzes potential reliability and congestion impacts that could occur when the AMS project interconnects to the grid.

3. The System Impact Study performed by SCE and the SCE Interconnection Facility Study (IFS)/Technical Assessment Study (TAS) demonstrates that the addition of the AMS project would cause new normal (N-0) and single contingency (N-1) overloads on the Kramer-Lugo No. 1 & No. 2 230 kV lines during 2013 summer peak and light spring system conditions.

4. The IFS/TAS study also identified a transient stability violation for loss of the Lugo-Cool Water 230 kV line.

5. The record contains analysis of two alternative mitigation plans to mitigation project-related overloads. The mitigation alternative selected by the Applicant involves installation of a telecommunication system using multi-stranded fiber optic cables and other communication equipment.

6. A planning-level project description was the basis of the general environmental analysis of the telecommunication system upgrades with the fiber optic cables set forth in Appendix A to Supplemental Staff Assessment Part C.

7. The AMS would meet the requirements and standards of all applicable LORS upon compliance with the recommended Conditions of Certification.

8. The Applicant has signed a power purchase agreement with Pacific Gas and Electric for renewable power supply.

9. The AMS is a solar generation which would provide clean renewable energy towards meeting state mandates and goals.

CONCLUSIONS OF LAW

1. With the implementation of the various mitigation measures specified in this Decision, and the Conditions of Certification which follow, the proposed transmission interconnection for the AMS project will not contribute to significant adverse direct, indirect, or cumulative impacts.

2. The Conditions of Certification below ensure that the transmission-related aspects of the AMS project will be designed, constructed, and operated in conformance with the applicable laws, ordinances, regulations, and standards identified in the appropriate portion of **Appendix A** of this Decision.

CONDITIONS OF CERTIFICATION

TSE-1 The project owner shall furnish to the CPM and to the CBO a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project

owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Table 1: Major Equipment List** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Equipment List
Breakers
Step-up Transformer
Switchyard
Busses
Surge Arrestors
Disconnects and Wave-traps
Take off facilities
Electrical Control Building
Switchyard Control Building
Transmission Pole/Tower
Insulators and Conductors
Grounding System

TSE-2 Prior to the start of construction the project owner shall assign an electrical engineer <u>and at least one of each</u> of the following to the project:

A. A civil engineer;

B. A geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering;

C. A design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or

D. A mechanical engineer.

(Business and Professions Code Sections 6704 et seq., require state registration to practice as a civil engineer or structural engineer in California.)

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical or civil and design engineer assigned in

conformance with Facility Design condition **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to predicted conditions used as a basis for design of earthwork or foundations.

The electrical engineer shall:

1. Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; and

2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action (1998 CBC, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance). The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and shall reference this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the

CPM, within five days, the reason for disapproval, and the revised corrective action required to obtain the CBO's approval.

TSE-4 For the power plant switchyard, outlet line and termination, the project owner shall not begin any increment of construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the Monthly Compliance Report:

A. Receipt or delay of major electrical equipment;

B. Testing or energization of major electrical equipment; and

C. The number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer attesting to compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

TSE-5 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to all applicable LORS, including the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations to the CBO as determined by the CBO.

A. The power plant switchyard and outlet line shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95 or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8), Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", California ISO standards, National Electric Code (NEC) and related industry standards.

B. Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to accommodate full output from the project and to comply with a short-circuit analysis.

C. Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.

D. The project conductors shall be sized to accommodate the full output from the project.

E. Termination facilities shall comply with applicable SCE interconnection standards.

F. The project owner shall provide to the CPM:

   i. The Special Protection System (SPS) sequencing and timing if applicable,

   ii. A letter stating the mitigation measures or projects selected by the transmission owners for each reliability criteria violation are acceptable,

   iii. An Operational study report based on the expected or current COD from the California ISO and/or SCE, and

   iv. A copy of the executed LGIA signed by the California ISO and the project owner.

Verification: At least 60 days prior to the start of construction of transmission facilities (or a lesser number of days mutually agreed to by the project owner and CBO), the project owner shall submit to the CBO for approval:

A. Design drawings, specifications and calculations conforming with CPUC General Order 95 or NESC, Title 8, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", NEC, applicable interconnection standards and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.

B. For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst case conditions"[7] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", NEC, applicable interconnection standards, and related industry standards.

C. Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-5** a) through f) above.

[7] Worst case conditions for the foundations would include for instance, a dead-end or angle pole.

D. The Special Protection System (SPS) sequencing and timing if applicable shall be provided concurrently to the CPM.

E. A letter stating the mitigation measures or projects selected by the transmission owners for each reliability criteria violation are acceptable,

F. An Operational study report based on the expected or current COD from the California ISO and/or SCE, and

G. A copy of the executed LGIA signed by the California ISO and the project owner.

TSE-6 The project owner shall inform the CPM and CBO of any impending changes that may not conform to requirements **TSE-5** a) through f), and have not received CPM and CBO approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or substation configurations shall not begin without prior written approval of the changes by the CBO and the CPM.

Verification: At least 60 days prior to the construction of transmission facilities, the project owner shall inform the CBO and the CPM of any impending changes that` may not conform to requirements of **TSE-5** and request approval to implement such changes.

TSE-7 The project owner shall provide the following Notice to the California Independent System Operator (California ISO) prior to synchronizing the facility with the California Transmission system:

1. At least one week prior to synchronizing the facility with the grid for testing, provide the California ISO a letter stating the proposed date of synchronization; and

2. At least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the California ISO Outage Coordination Department.

Verification: The project owner shall provide copies of the California ISO letter to the CPM when it is sent to the California ISO one week prior to initial synchronization with the grid. The project owner shall contact the California ISO Outage Coordination Department, Monday through Friday, between the hours of 0700 and 1530 at (916) 351-2300 at least one business day prior to synchronizing the facility with the grid for testing. A report of conversation with the California ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California transmission system for the first time.

TSE-8 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", applicable interconnection standards, NEC and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

A. "As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", and applicable interconnection standards, NEC, related industry standards, and these conditions shall be provided concurrently.

B. An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. "As built" drawings of the electrical, mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the "Compliance Monitoring Plan".

C. A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

E. TRANSMISSION LINE SAFETY AND NUISANCE

The project's transmission lines must be constructed and operated in a manner that protects environmental quality, assures public health and safety, and complies with applicable law. This section summarizes the analysis of record concerning the potential impacts of the transmission tie-line on aviation safety, radio-frequency interference, audible noise, fire hazards, nuisance shocks, hazardous shocks, and electromagnetic field exposure. The evidence presented was undisputed. (6/28/10 RT64-76, 81; Exs. 1, § 5.14; 48 [§ 12.0], 300, § 5.11.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

The Abengoa Mojave Solar (AMS) facility is a 250 megawatt (MW) power generating project to be constructed as two 125 MW facilities in two phases and as two separate sites: the Alpha facility and Beta facility. The Alpha facility will be built on 884 acres in the northwest portion of the property. The Beta facility will be constructed on the remaining 800 acres of the project site. (Exs. 1, pp. 2.0-1, 2.0-30, 2.0-31, and 5.7-1; 300 p. 5.11-4.)

The power generated by the project will be transmitted to Southern California Edison's (SCE's) transmission grid through SCE's existing 230-kilovolt (kV) Kramer-Cool Water # 1 transmission line. The project's key transmission components include:

- A new on-site 230-kV switchyard constructed on the Beta facility, from which the conductors would extend to the adjacent SCE power grid;
- Two new overhead 230-kV transmission lines that would separately connect each constituent unit to the new connection switchyard at the site;
- Project-related upgrade of the area's SCE transmission grid under the jurisdiction of the CPUC.

(Exs. 1, 5.4-9 – 5.4-10, 300 p. 5.11-4.)

The transmission lines will be supported on 23 new steel/concrete mono poles from the Alpha site and on about 9 poles from the Beta site. The pole heights are expected to average 80 to 100 feet. (Ex. 300, p. 5.11-4.)

Because the lines will connect to SCE's existing power grid, their conductors will be standard low-corona aluminum alloy cables typical of similar SCE lines. The

conductor configuration will follow SCE's guidelines that ensure line safety, efficiency, reliability, and maintainability. (Ex. 300, pp. 5.11-4 - 5.11-5.)

1. Potential Impacts

Laws, ordinances, regulations, and standards (LORS) have been established to ensure that transmission line impacts are below levels of potential significance. As summarized below, the record shows that the project will comply with all applicable LORS. If the project complies with applicable LORS, any transmission line-related safety and nuisance impacts would be significant. (Ex. 300, p. 5.11-5.

a. Aviation Safety

When transmission lines or their support structures intrude into the navigable air space there is potential for aircraft to collide with these structures. In this case, the record shows that the project's lines and support structures are neither near nor within restricted air space. Nor are there airports or runways in the area around the AMS site. The nearest airport is Edwards Air Force Base approximately 12 miles southwest of the project site.

Further, because the transmission line supports are not expected to exceed a maximum height of 110 feet, the project will not trigger the Federal Aviation Administration's requirement for a Notice of Proposed Construction or Alteration. This Notice is required when lines or supports reach 200 feet in height. (Exs. 1, p. 5.14-10; 300 pp. 5.11-5, 5.11-11.)

Based on the evidence, we find that the project does not pose an aviation hazard under FAA criteria and there are no impacts requiring mitigation.

b. Interference with Radio-Frequency Communication

Radio-frequency interference is an indirect effect of line operation. This interference is due to radio noise produced by the action of electric fields on the surface of the energized conductor. This process is known as corona discharge. The noise caused by this discharge causes interference with radio or television signal reception or interference with other forms of radio communication.

The level of any such interference usually depends on the magnitude or the electric fields involved and the distance from the line. As a result, the potential for such impacts is minimized by reducing the line electric fields and locating the line away from inhabited areas. (Ex. 300, p. 5.11-5.)

The evidence shows that the AMS project's transmission lines will be built and maintained in accordance with standard SCE practices that minimize surface irregularities and discontinuities. The low-corona design proposed for the AMS project is consistent with the designs used for other SCE lines of similar voltage ratings to reduce surface-field strengths and the related potential for corona effects. (Exs. 1, pp. 5.14-5.14-11, 300, p. 5.11-6.)

Furthermore, potential for corona-related interference typically occurs when lines of 345-kV and above are involved. Because the project proposes 230-kV lines, such potential is minimized with respect to the AMS project. (*Id*.)

Although the project is not likely to cause corona-related radio-frequency interference, we have adopted Condition of Certification **TLSN-2**, which requires the project owner to ensure that every reasonable effort will be made to identify and correct on a case-specific basis, any complaints of interference with radio or television signals from operation of the project-related lines and associated switchyards. (Ex. 300, p. 5.11-6.)

c. Audible Noise

The record includes an evaluation of the causes of audible radio noise and methods of reduction. Since the low-corona designs to be implemented by the AMS project minimize field strengths, the project's line operation is not expected to significantly contribute to existing background noise levels in the project area. (Exs., 1, p. 5.14-11, 300, p. 5.11-6.)[8]

d. Fire Hazards

The applicable LORS address fire hazards including those caused by sparks from conductors of overhead lines and resulting from direct contact between a line and nearby trees and other combustible objects. There is evidence that the AMS project lines are subject to standard fire prevention and suppression measures for similar SCE lines. (Exs.1, p. 5.14-15; 300, pp. 5.11-6 – 5.11-7.) And, as required by Condition of Certification **TLSN-4**, the project owner will implement CPUC General Order 95 (GO-95) and Title 14, California Code of

[8] The **Noise and Vibration** section of this Decision more fully evaluates project-induced noise.

Regulations, Section 1250, which individually and collectively govern clearance requirements to prevent hazardous shocks, grounding techniques to minimizes nuisance shocks, and installation, maintenance and inspections.

Regarding possible contact between project lines and nearby trees, and other combustible objects, the evidence shows that the project lines would traverse a mostly agricultural or commercial area with no trees of sufficient size to pose a contact-related fire hazard. (Ex. 300, p. 5.11-6.)

e. Hazardous Shocks

Hazardous shocks can result from direct or indirect contact between an individual and an energized line. These shocks can cause serious physiological harm or death and remain a motivating force in the design and operation of transmission and other high-voltage lines. However, no design-specific federal or state regulations exist to prevent hazardous shocks from overhead power lines. Instead, safety is ensured within the industry by compliance with requirements specifying the minimum national safe operating clearances applicable in areas where the line might be accessible to the public.

As required by Condition of Certification **TLSN-1**, the project owner will implement the measures of GO-95 for preventing direct contact with energized lines and comply with SCE's EMF-reduction guidelines. Compliance with this Condition will satisfactorily mitigate any risk of hazardous shock. (Exs. 1, pp. 5.14-11 – 5.14-12, 300, p. 5.11-7.)

f. Nuisance Shocks

Nuisance shocks, which are caused by current flow, primarily result from direct contact with metal objects electrically charged by fields from the energized line. These shocks are generally incapable of causing significant physiological harm.

As with hazardous shocks, there are no design-specific federal or state regulations to limit transmission line-related nuisance shocks. But, as the evidence shows, these shocks are effectively minimized for modern overhead high-voltage lines through standard grounding procedures. The procedures are set forth in the National Electrical Safety Code (NESC) and in guidelines jointly promulgated by the American National Standards Institute (ANSI) and the

Institute of Electrical and Electronics Engineers (IEEE). (Ex. 1, pp. 5.14-11 and 5.14-12, 300, p. 5.11-7.)

The project owner's compliance with these procedures as required by Condition of Certification **TLSN-5** will minimize the potential for nuisance shocks. **TLSN-5** specifically requires the project owner to ensure that all permanent metallic objects within the right-of-way of the project-related lines are grounded according to industry standards. (Ex. 300, p. 5.11-7.)

g. Electric and Magnetic Field Exposure

Possible adverse health effects from exposure to electric and magnetic fields (EMF) raise public health concerns about people living near high-voltage lines. However, there is no clear evidence establishing that EMF fields pose a significant health hazard to exposed humans. Indeed, even the short-term exposures of plant workers, regulatory inspectors, maintenance personnel, and individuals in the immediate vicinity of lines, are not significantly related to the above-stated health concern. (Ex. 300, p. 5.11-9.)

Even though there is considerable uncertainty about EMF health effects, current policies and practices are informed by the available information showing that:

- Any exposure-related health risk to the exposed individual will likely be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns are about the magnetic field.
- The measures employed for such field reduction can affect line safety, reliability, efficiency, and maintainability, depending on the type and extent of such measures. (Ex. 300, pp. 5.11-7 - 5.11-8.)

The CPUC regulates the installation and operation of high-voltage lines and has determined that only no-cost or low-cost measures are justified in any effort to reduce power line fields to address EMF-related health concerns, and that these measures should be should be made only in connection with new or modified lines. (Ex. 300, p. 5.11-8.) In this regard, the CPUC requires each utility within its jurisdiction to establish EMF-reducing measures and incorporate them into the

design of new or modified powerlines for each service area. By designing the proposed project line according to existing field strength-reducing guidelines, AMS would comply with CPUC requirements for line field management. (Ex. 300, pp. 5.11-8 – 5.11-9.)

The record shows that the Applicant calculated the maximum field strengths at representative points along the proposed routes to determine whether operating the proposed project lines would cause any significant increases in area fields above existing lines. Field intensities were calculated before and during AMS project's line operation and a manner that reflects the interactive effects of fields from all contributing conductors. (Exs. 1, pp. 5.14-12 – 5.14-15; 300, p. 5.11-10.)

Based on the calculations, the maximum intensity would increase slightly from 24.8 mG to 25.5mG with the addition of the AMS lines fields at the edge of rights-of-way for existing corridor lines. (Ex. 1, Figures 5.14-1 and 5.14.-2; 300, p. 5.11-10.) The maximum electric field strength was calculated at 0.52 kV/m at the edge of the right-of-way and would not change with the introduction of the electric fields from AMS operations. (Ex. 300, p. 5.11-10.)

Since these field strengths are as expected for similar SCE lines, no additional mitigation is required. However, we concur with Staff's recommendation that the Applicant validate its current assumptions about reduction efficiency both before and after energization. We have therefore adopted Condition of Certification **TLSN-3**.

2. Cumulative Impacts

When field intensities are measured or estimated for a particular location, they necessarily reflect the cumulative effects of fields from all contributing conductors. As discussed above, because the AMS project's proposed 230-kV line and switchyard will be designed pursuant to SCE guidelines as required by the CPUC for effective field management, the project's expected contribution to cumulative area exposures will be at levels for SCE lines of similar voltage and current-carrying capacity.

With implementation of the Conditions of Certification, any potential cumulative impacts would be less than significant.

FINDINGS OF FACT

Based on the evidence, we find that:

1. Long-term electromagnetic field exposure is insignificant in this case because of the general absence of residences along the proposed route. On-site worker or public exposure will be short-term and at levels expected for lines of similar design and current-carrying capacity. This type of exposure has not been established as posing a significant human health hazard.

2. The potential for nuisance shocks will be minimized through grounding and other field-reducing measures performed in accordance with SCE guidelines.

3. The potential for hazardous shocks will be minimized with compliance with the height and clearance requirements of CPUC General Order 95.

4. There are no potential fire hazards associated with the project's transmission lines. However, compliance with Title 14, California Code of Regulations, section 1250, will minimize possible fire hazards.

5. Neither the project location nor the proposed related lines and line supports poses a significant aviation hazard.

6. Building and maintaining the project's lines in accordance with standard SCE practices minimizes the potential for corona noise and its related interference with radio-frequency communication.

7. The Conditions of Certification reasonably ensure that the project's transmission lines will not have significant direct, indirect, or cumulative adverse environmental impacts on public health and safety, nor cause impacts in terms of aviation safety, radio/TV communication interference, audible noise, fire hazards, nuisance or hazardous shocks, or electromagnetic field exposure.

CONCLUSION OF LAW

1. We therefore conclude that, with implementation of the Conditions of Certification, the project will conform with all applicable laws, ordinances, regulations, and standards relating to Transmission Line Safety and Nuisance as identified in the pertinent portion of **APPENDIX A** of this Decision.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the proposed overhead 230-kV project lines according to the requirements of California Public Utility Commission's GO-95, GO-52, GO-131-D, Title 8, and Group 2, High Voltage Electrical Safety Orders, Sections 2700 through 2974 of the California Code of Regulations, and SCE's EMF-reduction guidelines.

Verification: At least thirty days before starting construction of the transmission lines or related structures and facilities, the project owner shall submit to the Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the lines will be constructed according to the requirements stated in the condition.

TLSN-2 The project owner shall ensure that every reasonable effort will be made to identify and correct, on a case-specific basis, any complaints of interference with radio or television signals from operation of the project-related lines and associated switchyards. The project owner shall maintain written records for a period of five years, of all complaints of radio or television interference attributable to line operation together with the corrective action taken in response to each complaint. This record shall be submitted in an Annual Report to the Compliance Project Manager on transmission line safety and nuisance-related requirements.

Verification: All reports of line-related complaints shall be summarized for the project-related lines and included during the first five years of plant operation in the Annual Compliance Report.

TLSN-3 The project owner shall use a qualified individual to measure the strengths of the electric and magnetic fields from the line at the points of maximum intensity at the edge the AMS lines' rights-of-way as identified by the applicant on page 5.14-14, and in Figures 5.14-1 and 5.14-2. The measurements shall be made before and after energization according to the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) standard procedures. These measurements shall be completed not later than six months after the start of operations.

Verification: The project owner shall file copies of the pre-and post-energization measurements with the CPM within 60 days after completion of the measurements.

TLSN-4 The project owner shall ensure that the rights-of-way of the proposed transmission lines are kept free of combustible material, as required under the provisions of Section 4292 of the Public Resources Code and Section 1250 of Title 14 of the California Code of Regulations.

Verification: During the first five years of operation, the project owner shall provide a summary of inspection results and any fire prevention activities carried out along the rights-of-way and provide such summaries in the Annual Compliance Report for transmission line safety and nuisance-related requirements.

TLSN-5 The project owner shall ensure that all permanent metallic objects within the right-of-way of the project-related lines are grounded according to industry standards regardless of ownership.

Verification: At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter confirming compliance with this Condition.

V. PUBLIC HEALTH AND SAFETY

A. GREENHOUSE GAS (GHG) EMISSIONS

1. Introduction and Summary

There is scientific consensus that climate change is occurring and that human activity contributes in some measure to that change. Man-made emissions of greenhouse gases, if not sufficiently curtailed, are likely to contribute further to continued increases in global temperatures. Indeed, the California Legislature has found that "[g]lobal warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California" (Health & Safety Code, § 38501).

AMS, as a solar energy generation project, is exempt from the mandatory GHG emission reporting requirements for electricity generating facilities as currently required by the California Air Resources Board (CARB) for compliance with the California Global Warming Solutions Act of 2006 (AB 32 Núñez, Statutes of 2006, Chapter 488, Health & Safety Code, § 38500 et seq.) (ARB 2008a). However, the project may be subject to future reporting requirements and GHG reductions or trading requirements as these regulations become more fully developed and implemented.

SB 1368, enacted in 2006, and regulations adopted by the Energy Commission and the Public Utilities Commission pursuant to the bill, prohibits California utilities from entering into long-term commitments with any base load facilities that exceed the Emission Performance Standard of 0.500 metric tonnes CO_2 per megawatt-hour (1,100 pounds CO_2/MWh). Specifically, the SB 1368 Emission Performance Standard (EPS) applies to base load power from new power plants, new investments in existing power plants, and new or renewed contracts with terms of five years or more, including contracts with power plants located outside of California. If a project, instate or out of state, plans to sell base load electricity to a California utility that utility will have to demonstrate that the project meets the EPS. *Base load* units are defined as units that operate at a capacity factor higher than 60 percent. As a renewable electricity generating facility, AMS is determined by rule to be compliant with the SB 1368 EPS.

The generation of electricity using fossil fuels, even in a back-up generator at a thermal solar plant, produces air emissions known as greenhouse gases in

addition to the criteria air pollutants that have been traditionally regulated under the federal and state Clean Air Acts. California is actively pursuing policies to reduce GHG emissions that include adding non-GHG emitting renewable generation resources to the system.

The greenhouse gases are carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFC), and perflurocarbons (PFC). CO_2 emissions are far and away the most common of these emissions; as a result, GHG emissions are often expressed in terms of "metric tons of CO_2-equivalent" ($MTCO_2e$) for simplicity.

Since the impact of the GHG emissions from a power plant's operation has global effects, those impacts should be assessed not only by analysis of the plant's emissions, but also in the context of the operation of the entire electricity system of which the plant is an integrated part. Furthermore, the impact of the GHG emissions from a power plant's operation should be analyzed in the context of applicable GHG laws and policies, such as AB 32.

In this part of the Decision we consider:

- Whether AMS GHG construction emissions will have significant impacts;
- Whether AMS operation will be consistent with the state's GHG policies and will help achieve the state's GHG goals by causing a decrease in overall electricity system GHG emissions.

2. Policy and Regulatory Framework

We begin with the observation as stated by the Legislature 35 years ago, "it is the responsibility of state government to ensure that a reliable supply of electrical energy is maintained at a level consistent with the need for such energy for protection of public health and safety, for promotion of the general welfare, and for environmental quality protection." (Pub. Res. Code, § 25001.) Today, as a result of legislation, the most recent addition to "environmental quality protection" is the reduction of GHG emissions. Several laws and statements of policy are applicable.

a. <u>AB 32</u>

The foundation of California's GHG policy is the California Global Warming Solutions Act of 2006. [Assembly Bill 32, codified in Health & Saf. Code, § 38560 et seq. (hereinafter AB 32).] AB 32 requires CARB to adopt regulations that will

reduce statewide GHG emissions, by the year 2020, to the level of statewide GHG emissions that existed in 1990. Gubernatorial Executive Order S-3-05 (June 1, 2005) requires a further reduction, to a level 80 percent below the 1990 GHG emissions, by the year 2050.

Along with all other regulatory agencies in California, the Energy Commission recognizes that meeting the AB 32 goals is vital to the state's economic and environmental health. While AB 32 goals have yet to be translated into regulations that limit GHG emissions from generating facilities, the scoping plan adopted by ARB relies heavily on cost-effective energy efficiency and demand response, renewable energy, and prioritization of generation resources to achieve significant reductions of emissions in the electricity sector by 2020. Even more dramatic reductions in electricity sector emissions would likely be required to meet California's 2050 greenhouse gas reduction goal. Facilities under our jurisdiction, such as AMS, must be consistent with these policies.[9]

b. Renewable Portfolio Standard

California statutory law requires the state's utilities to be obtaining at least 20 percent of their electricity supplies from renewable sources by the year 2010. (Pub. Util. Code, § 399.11 et seq.) Gubernatorial Executive Orders increase the requirement to 33 percent and require CARB to adopt regulations to achieve the goal. [Governor's Exec. Orders Nos. S-21-09 (Sept. 15, 2009), S-14-08 (Nov. 17, 2008).]

c. Emissions Performance Standard

Senate Bill (SB) 1368 of 2006, and regulations adopted by the Energy Commission and the Public Utilities Commission pursuant to the bill, prohibit utilities from entering into long-term commitments with any base load facilities that exceed an Emission Performance Standard (EPS) of 0.500 metric tonnes of CO_2 per megawatt-hour (this is the equivalent of 1100 pounds CO_2/MWh). (Pub. Util. Code, § 8340 et seq.; Cal. Code Regs., tit. 20, § 2900 et seq.; CPUC D0701039.) Currently, the EPS is the only LORS that has the effect of limiting power plant GHG emissions. AMS is exempt from SB 1368 because it would operate at or below a 60 percent capacity factor.

[9] Of course, AMS and all other stationary sources will need to comply with any applicable GHG LORS that take effect in the future.

d. Loading Order

In 2003 the Energy Commission and the CPUC agreed on a "loading order" for meeting electricity needs. The first energy resources that should be utilized are energy efficiency and demand response (at the maximum level that is feasible and cost-effective), followed by renewables and distributed generation, combined heat and power (also known as cogeneration), and finally the most efficient available fossil fuel resources and infrastructure development.[10] CARB's AB 32 Scoping Plan reflects these policy preferences. (California Air Resources Board, Climate Change Scoping Plan, December 2008.)

We now consider whether, and how well, AMS would advance these goals and policies. We begin by reviewing the project's emissions both during construction and during operation.

3. GHG Emissions During Construction of the AMS Facility

Construction of industrial facilities such as power plants requires coordination of numerous equipment and personnel. The concentrated on-site activities result in short-term, unavoidable increases in vehicle and equipment emissions that include greenhouse gases. AMS construction is expected to last approximately 26 months. **Greenhouse Gas Table 1** below show the Applicant's greenhouse gas emissions estimate for the entire construction period.

Greenhouse Gas Table 1
Estimated AMS Potential Construction Greenhouse Gas Emissions

	CO_2-Equivalent (MTCO2E) [a,b]
Onsite Equipment (all four phases)	29,661
Delivery Vehicles	2,984
Construction Worker Vehicles	10,369
Entire Construction Period Total	**43,015** [c]

Source: Ex. 302, p. 5.1-72.
[a] One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.
[b] The vast majority of the CO2E emissions, over 99%, is CO_2 from construction combustion sources.

[10] California Energy Commission 2008, *2008 Integrated Energy Policy Report Update*, (IEPR) (CEC-100-2008-008-CMF.)

[c] Staff performed a separate construction emission estimate and determined considerably lower total construction period CO_2 emissions than estimated by the applicant, but has retained the more conservative applicant estimate. Staff's estimate shows higher on-road equipment emissions (delivery and worker vehicles emissions), but substantially lower off-road equipment emissions due to two main factors: 1) the applicant estimated emissions for a large number of onsite on-road equipment as if they were off-road equipment. The applicant did not appear to apply load factors to adjust the off-road equipment horsepower hour estimate down from 100 percent load.

There is no adopted, enforceable federal or state LORS applicable to AMS construction emissions of GHG. Nor is there a quantitative threshold over which GHG emissions are considered "significant" under CEQA. Nevertheless, there is guidance from regulatory agencies on how the significance of such emissions should be assessed. For example, the most recent guidance from CARB staff recommends a "best practices" threshold for construction emissions. [CARB, Preliminary Draft Staff Proposal, Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act (Oct. 24, 2008)]. Such an approach is also recommended on an interim basis, or proposed, by major local air districts.

We understand that "best practices" includes the implementation of all feasible methods to control construction-related GHG emissions. As the "best practices" approach is currently recommended by the state agency primarily responsible not only for air quality standards but also for GHG regulation, we will use it here to assess the GHG emissions from AMS construction.

To limit vehicle emissions of both criteria pollutants and GHG during construction, AMS will use (1) operational measures, such as limiting vehicle idling time and shutting down equipment when not in use; (2) regular preventive maintenance to prevent emission increases due to vehicular engine problems; and (3) use of low-emitting diesel engines meeting federal emissions standards for construction equipment, whenever available. (Ex. 302, Appendix Air Quality AIR-1, p. 5.1-74.)

Control measures that we have adopted elsewhere in this Decision to address criteria pollutant emissions would further minimize greenhouse gas emissions to the extent feasible. Also, the requirement that the owner use newer construction equipment will increase fuel efficiency and minimize tailpipe emissions. (See, e.g. Condition of Certification **AQ-SC5**.)

We find that the measures described above to directly and indirectly limit the emission of GHGs during the construction of AMS are in accordance with current best practices. We therefore find that the evidence shows that the GHG

emissions from construction activities would not exceed the level of significance. (Ex. 302, Appendix Air Quality AIR-1, pp. 5.1-74.)

4. Direct/Indirect Operation Impacts and Mitigation

a. Anticipated Emissions

Solar energy is the primary fuel for the AMS project, which is greenhouse gas free. The project will , however, use natural gas in the two auxiliary HTF heaters used for morning startup and for freeze protection, and gasoline and diesel fuel use in the maintenance vehicles, offsite delivery vehicles, staff and employee vehicles, the two fire water pump engines, and the two emergency generator engines. Another GHG emission source for this proposed project is SF_6 from electrical equipment leakage. (Ex. 302, Appendix Air Quality AIR-1, p.5.1-73.)

Operations GHG emissions are shown as follows in **Greenhouse Gas Table 2**.

Greenhouse Gas Table 2
Estimated AMS Potential Operating Greenhouse Gas Emissions

	Annual CO_2-Equivalent (MTCO2E) [a]
Auxiliary HTF Heaters [b]	10,018
Emergency Generator Engine [b]	183.2
Fire Pump Engine [b]	8.1
Maintenance Vehicles [b]	119.6
Delivery Vehicles [b]	31.3
Employee Vehicles [b]	512.7
Equipment Leakage (SF_6)	10.5
Total Project GHG Emissions – MTCO2E [b]	**10,884**
Facility MWh per year	600,000
Facility GHG Emission Rate (MTCO2E/MWh)	0.018

Sources: Ex. 302, p. 5.1-73.
[a] One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.
[b] The vast majority of the CO2E emissions, over 99%, is CO_2 from these emission sources.

AMS is estimated to emit nearly 11,000 metric tonnes of CO_2-equivalent GHG emissions per year directly from primary and secondary emission sources. AMS, as a renewable energy generation facility, is determined by rule to comply with the Greenhouse Gas Emission Performance Standard requirements of SB 1368 (Cal. Code Regs., tit. 20, Chapter 11, § 2903 [b][1]). Moreover, AMS has an estimated GHG emission rate of 0.018 MTCO2E/MWh, which is well below the Greenhouse Gas Emission Performance Standard of 0.500 MTCO2/MWh. (Ex. 302, Appendix Air Quality AIR-1, p. 5.1-73.)

b. Assessment of Operational Impacts

As we have previously noted, a project's GHG emissions have global impacts. While it may be true that in general, when an agency conducts a CEQA analysis of a proposed project, it does not need to analyze how the operation of the proposed project is going to affect the entire system of projects in a large multistate region, analysis of the impacts of GHG emissions from power plants requires consideration of the project's impacts on the entire electricity system.

California's electricity system – which is actually part of a system serving the entire western region of the U.S., Canada, and Mexico – is large and complex. Hundreds of power plants, thousands of miles of transmission and distribution lines, and millions of points of electricity demand operate in an interconnected, integrated, and simultaneous fashion. Because the system is integrated, and because electricity is produced and consumed instantaneously, and will continue to be until large-scale electricity storage technologies are available, any change in demand and, most important for this analysis, any change in output from any generation source, is likely to affect the output from all generators. (*Committee Guidance on Fulfilling California Environmental Quality Act Responsibilities for Greenhouse Gas Impacts in Power Plant Siting Applications,* CEC-700-2009-004, pp. 20 to 22.) [11] (Hereinafter referred to as "Committee CEQA Guidance")

The California Independent System Operator (CAISO) is responsible for operating the system so that it provides power reliably and at the lowest cost. Thus the CAISO dispatches generating facilities generally in order of cheapest to operate (i.e., typically the most efficient) to most expensive (i.e., typically the least efficient). Because operating cost is correlated with heat rate (the amount of fuel that it takes to generate a unit of electricity), and, in turn, heat rate is directly correlated with emissions (including GHG emissions), when a power plant runs, it usually will take the place of another facility with higher emissions that otherwise would have operated. Due to the integrated nature of the electrical grid, the operational plant and the displaced plant may be hundreds of miles apart. (Committee CEQA Guidance.) Because one plant's operation could affect GHG emissions hundreds of miles away, the necessity of assessing their operational GHG emissions on a system-wide basis becomes clear.

As California moves towards an increased reliance on renewable energy by implementing the Renewables Portfolio Standard (RPS), non-renewable energy

[11] The report was issued in March 2009 and is found on the Commission website at: **http://www.energy.ca.gov/2009publications/CEC-700-2009-004/CEC-700-2009-004.PDF**

resources will be displaced. These reductions in non-renewable energy, shown in **Greenhouse Gas Table 3**, are targeted to be as much as 36,500 GWh. These assumptions are conservative in that the forecasted growth in electricity retail sales assumes that the impacts of planned increases in expenditures on (uncommitted) energy efficiency are already embodied in the current retail sales forecast[12]. Staff estimates that as much as 18,000 GWh of additional savings due to uncommitted energy efficiency programs may be forthcoming.[13] This would reduce non-renewable energy needs by a further 12,000 GWh given a 33% RPS. (Ex. 302, Appendix Air Quality AIR-1, p. 5.1-75-5.1-76.)

Greenhouse Gas Table 3
Estimated Changes in Non-Renewable Energy
Potentially Needed to Meet California Loads, 2008-2020

California Electricity Supply	***Annual GWh***	
Statewide Retail Sales, 2008, actual [a]	264,794	
Statewide Retail Sales, 2020, forecast [a]	289,697	
Growth in Retail Sales, 2008-20	24,903	
Growth in Net Energy for Load [b]	29,840	
California Renewable Electricity	**GWh @ 20% RPS**	**GWh @ 33% RPS**
Renewable Energy Requirements, 2020 [c]	57,939	95,600
Current Renewable Energy, 2008	29,174	
Change in Renewable Energy-2008 to 2020	28,765	66,426
Resulting Change in Non-Renewable Energy	176	(36,586)

Source: Ex. 302, p. 5.1-76.
Notes:
a. 2009 IPER Demand Forecast, Form 1.1c. Excludes pumping loads for entities that do not have an RPS.
b. 2009 IEPR Demand Forecast, Form 1.5a.
c. RPS requirements are a percentage of retail sales.

AMS will be capable of annually providing 500 GWh of renewable generation energy to replace resources that are or will likely be precluded from serving California loads. State policies, including GHG goals, are discouraging or prohibiting new contracts and new investments in high GHG-emitting facilities

[12] Energy efficiency savings are already represented in the current Energy Commission demand forecast adopted December 2009. (Ex. 302, p. 5.1-76.).

[13] See *Incremental Impacts of Energy Efficiency Policy Initiatives Relative to the 2009 Integrated Energy Policy Report Adopted Demand Forecast* (CEC-200-2010-001-D, January, 2010), page 2. Table 1 indicates that additional conservation for the three investor-owned utilities may be as high as 14,374 GWh. Increasing this value by 25 percent to account for the state's publicly-owned utilities yields a total reduction of 17,967 GWh.

such as coal-fired generation, generation that relies on water for once-through cooling, and aging power plants. Some of the existing plants that are likely to require substantial capital investments to continue operation in light of these policies may be unlikely to undertake the investments and will retire or be replaced. (Ex. 302, Appendix Air Quality AIR-1, p. 5.1-76.)

High GHG-emitting resources, such as coal, are effectively prohibited from entering into new long-term contracts for California electricity deliveries as a result of the EPS. Between now and 2020, more than 18,000 GWh of energy procured by California utilities under these contracts will have to reduce GHG emissions or be replaced; these contracts are presented in **Greenhouse Gas Table 4**. (Ex. 302, Appendix Air Quality AIR-1, p. 5.1-77.)

Greenhouse Gas Table 4
Expiring Long-term Contracts with Coal-fired Generation 2009 – 2020

Utility	***Facility*** [a]	***Contract Expiration***	***Annual GWh Delivered to CA***
PG&E, SCE	Misc In-state Qual. Facilities [a]	2009-2019	4,086
LADWP	Intermountain	2009-2013	3,163 [b]
City of Riverside	Bonanza, Hunter	2010	385
Department of Water Resources	Reid Gardner	2013 [c]	1,211
SDG&E	Boardman	2013	555
SCE	Four Corners	2016	4,920
Turlock Irrigation District	Boardman	2018	370
LADWP	Navajo	2019	3,832
TOTAL			**18,522**

Source: Energy Commission staff based on Quarterly Fuel and Energy Report (QFER) filings.
Notes:
a. All facilities are located out-of-state except for the Miscellaneous In-state Qualifying Facilities.
b. Estimated annual reduction in energy provided to LADWP by Utah utilities from their entitlement by 2013.
c. Contract not subject to Emission Performance Standard, but the Department of Water Resources has stated its intention not to renew or extend.

This represents almost half of the energy associated with California utility contracts with coal-fired resources that will expire by 2030. If the State enacts a carbon adder[14], all the coal contracts (including those in **Greenhouse Gas Table 4**, which expire by 2020, and other contracts that expire beyond 2020 and are not shown in the table) may be retired at an accelerated rate as coal-fired energy

[14] A carbon adder or carbon tax is a specific value added to the cost of a project for per ton of associated carbon or carbon dioxide emissions. Because it is based on, but not limited to, actual operations and emission and can be trued up at year end, it is considered a simple mechanism to assign environmental costs to a project.

becomes economically uncompetitive due to the carbon adder or the capital needed to capture and sequester the carbon emissions.

Also shown are the approximate 500 MW of in-state coal and petroleum coke-fired capacity that may be unlikely to contract with California utilities for baseload energy due to the SB1368 EPS. As these contracts expire, new and existing generation resources will replace the lost energy and capacity. Some will come from renewable generation such as this proposed project; some will come from new and existing natural gas fired generation. All of these new facilities will have substantially lower GHG emissions rates than coal and petroleum coke-fired facilities which typically average about 1.0 $MTCO_2$/MWh without carbon capture and sequestration. Thus, new renewable facilities will result in a net reduction in GHG emissions from the California electricity sector. (Ex. 302, Appendix Air Quality AIR-1, pp. 5.1-77 -5.1-78.)

The State Water Resource Control Board (SWRCB) has proposed major changes to once-through cooling (OTC) units, shown in **Greenhouse Gas Table 5** below, which would likely extensive capital to retrofit, or retirement, or substantial curtailment of dozens of generating units. In 2008, these units collectively produced almost 58,000 GWh. While the more recently built OTC facilities may well install dry or wet cooling towers and continue to operate, the aging OTC plants are not likely to be retrofit to use dry or wet cooling towers without the power generation also being retrofit or replaced to use a more efficient and lower GHG emitting combined cycle gas turbine technology. Most of these existing OTC units operate at low capacity factors, suggesting a limited ability to compete in the current electricity market. Although the timing would be uncertain, new resources would out-compete aging plants and would displace the energy provided by OTC facilities and likely accelerate their retirements.

Any additional costs associated with complying with the SWRCB regulation would be amortized over a limited revenue stream today and into the foreseeable future. Their energy and much of their dispatchable, load-following capability will have to be replaced. These units constitute over 15,000 MW of merchant capacity and 17,800 GWh of merchant energy. Of this, much but not all of the capacity and energy are in local reliability areas, requiring a large share of replacement capacity – absent transmission upgrades – to locations in the same local reliability area. **Greenhouse Gas Table 5** provides a summary of the utility and merchant energy supplies affected by the OTC regulations.

New renewable generation resources will emit substantially less GHG emissions on average than other energy generation sources. Existing aging and OTC natural gas facility generation typically averages 0.6 to 0.7 $MTCO_2$/MWh, which is much less efficient, higher GHG emitting, than a renewable energy project like AMS. A project like AMS, located far from the coastal load pockets like the Los Angeles Local Reliability Area (LRA), would more likely provide energy support to facilitate the retirement of some aging and/or OTC power plants, but would not likely provide any local capacity support at or near the coastal OTC units. Regardless, due to its low greenhouse gas emissions, AMS would serve to reduce GHG emissions from the electricity sector. (Ex. 302, Appendix Air Quality AIR-1, p. 5.1-78.)

Greenhouse Gas Table 5
Aging and Once-Through Cooling Units: 2008 Capacity and Energy Output [a]

Plant, Unit Name	*Owner*	*Local Reliability Area*	*Aging Plant?*	*Capacity (MW)*	*2008 Energy Output (GWh)*	*GHG Emission Rate ($MTCO_2/MWh$)*
Diablo Canyon 1, 2	Utility	None	No	2,232	17,091	Nuclear
San Onofre 2, 3	Utility	L.A. Basin	No	2,246	15,392	Nuclear
Broadway 3 [b]	Utility	L.A. Basin	Yes	75	90	0.648
El Centro 3, 4 [b]	Utility	None	Yes	132	238	0.814
Grayson 3-5 [b]	Utility	LADWP	Yes	108	150	0.799
Grayson CC [b]	Utility	LADWP	Yes	130	27	0.896
Harbor CC	Utility	LADWP	No	227	203	0.509
Haynes 1, 2, 5, 6	Utility	LADWP	Yes	1,046	1,529	0.578
Haynes CC	Utility	LADWP	No	560	3,423	0.376
Humboldt Bay 1, 2 [a]	Utility	Humboldt	Yes	107	507	0.683
Olive 1, 2 [b]	Utility	LADWP	Yes	110	11	1.008
Scattergood 1-3	Utility	LADWP	Yes	803	1,327	0.618
Utility-Owned				**7,776**	**39,988**	**0.693**
Alamitos 1-6	Merchant	L.A. Basin	Yes	1,970	2,533	0.661
Contra Costa 6, 7	Merchant	S.F. Bay	Yes	680	160	0.615
Coolwater 1-4 [b]	Merchant	None	Yes	727	576	0.633
El Segundo 3, 4	Merchant	L.A. Basin	Yes	670	508	0.576
Encina 1-5	Merchant	San Diego	Yes	951	997	0.674
Etiwanda 3, 4 [b]	Merchant	L.A. Basin	Yes	666	848	0.631
Huntington Beach 1, 2	Merchant	L.A. Basin	Yes	430	916	0.591
Huntington Beach 3, 4	Merchant	L.A. Basin	No	450	620	0.563
Mandalay 1, 2	Merchant	Ventura	Yes	436	597	0.528
Morro Bay 3, 4	Merchant	None	Yes	600	83	0.524
Moss Landing 6, 7	Merchant	None	Yes	1,404	1,375	0.661
Moss Landing 1, 2	Merchant	None	No	1,080	5,791	0.378
Ormond Beach 1, 2	Merchant	Ventura	Yes	1,612	783	0.573
Pittsburg 5-7	Merchant	S.F. Bay	Yes	1,332	180	0.673
Potrero 3	Merchant	S.F. Bay	Yes	207	530	0.587
Redondo Beach 5-8	Merchant	L.A. Basin	Yes	1,343	317	0.810
South Bay 1-4	Merchant	San Diego	Yes	696	1,015	0.611
Merchant-Owned				**15,254**	**17,828**	**0.605**
Total In-State OTC				**23,030**	**57,817**	

Source: Energy Commission staff based on Quarterly Fuel and Energy Report (QFER) filings.

a. OTC Humboldt Bay Units 1 and 2 are included in this list. They must retire in 2010 when the new Humboldt Bay Generating Station (not ocean-cooled), currently under construction, enters commercial operation.

b. Units are aging but are not OTC.

The proposed AMS promotes the state's efforts to move towards a high-renewable, low-GHG electricity system, and, therefore, reduce the amount of natural gas used by electricity generation and greenhouse gas emissions. Its use of solar power, resultant limited GHG emissions, and likely replacement of older existing plant capacity, furthers the State's strategy to promote generation system efficiency and reduce fossil fuel use and GHG emissions.

Net GHG emissions for the integrated electric system will decline when new renewable power plants are added to: 1) move renewable generation towards the 33 percent target; 2) improve the overall efficiency, or GHG emission rate, of the electric system; or 3) serve load growth or capacity needs more efficiently, or with fewer GHG emissions. We find that AMS furthers the state's progress toward achieving these important goals and is consistent with State policies. (Ex., 302, Appendix Air Quality AIR-1, p. 5.1-75.)

5. Cumulative Impacts on Greenhouse Gases

Cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or . . . compound or increase other environmental impacts." (CEQA Guidelines § 15355.) "A cumulative impact consists of an impact that is created as a result of a combination of the project evaluated in the EIR together with other projects causing related impacts." (CEQA Guidelines § 15130[a][1].) Such impacts may be relatively minor and incremental, yet still be significant because of the existing environmental background, particularly when one considers other closely related past, present, and reasonably foreseeable future projects.

GHG assessment is by its very nature a cumulative impact assessment. AMS would emit a limited amount of greenhouse gases and, therefore, we have analyzed its potential cumulative impact in the context of its effect on the electricity system, resulting GHG emissions from the system, and existing GHG regulatory requirements and GHG energy policies. The evidence supports our finding that AMS would not cause or contribute to a significant adverse cumulative impact on GHG, and would in fact result in a decrease in GHG from the generation of electricity in California. (Ex. 302, Appendix Air Quality AIR-1, pp. 5.1-81.)

6. Closure and Decommissioning

Eventually the facility would close, either at the end of its useful life or due to some unexpected situation such as a natural disaster or catastrophic facility

breakdown. When the facility closes, all sources of air emissions would cease to operate and thus impacts associated with those greenhouse gas emissions would no longer occur. The only other expected, albeit temporary, GHG emissions would be equipment exhaust (off-road and on-road) from dismantling activities. These activities would be of much a shorter duration than construction of the proposed project, equipment used to dismantle the facility are assumed to have lower comparative GHG emissions due to technology advancement, and would be required to be controlled in a manner at least equivalent to that required during construction. It is assumed that the beneficial GHG impacts of this facility, displacement of fossil fuel fired generation, would be replaced by the construction of newer more efficiency renewable energy or other low GHG generating technology facilities. Also, the recycling of the facility components (steel, concrete, etc.) could indirectly reduce GHG emissions from decommissioning activities. Therefore, while there would be temporary adverse greenhouse gas CEQA impacts during decommissioning they are determined to be less than significant. (Ex. 302, Appendix Air Quality AIR-1, pp. 5.1-78 – 5.1-79.)

7. Mitigation Measures/Proposed Conditions of Certification

No Conditions of Certification related to Greenhouse Gas emissions are proposed. The project owner would comply with any future applicable GHG regulations formulated by the ARB, such as GHG reporting or emissions cap and trade markets.

FINDINGS OF FACT

1. The GHG emissions from the AMS project construction are likely to be 43,015 $MTCO_2$ equivalent ("$MTCO_2E$") during the 26-month construction period.

2. The AMS will use best practices to control its construction-related GHG emissions.

3. Construction-related GHG emissions are less than significant if they are controlled with best practices.

4. State government has a responsibility to ensure a reliable electricity supply, consistent with environmental, economic, and health and safety goals.

5. California utilities are obligated to meet whatever demand exists from any and all customers.

6. Under SB 1368 and implementing regulations, California's electric utilities may not enter into long-term commitments with base load power plants with CO_2 emissions that exceed the Emissions Performance Standard ("EPS") of 0.500 $MTCO_2$ / MWh.

7. The maximum annual CO_2 emissions from AMS operation will be nearly 11,000 $MTCO_2$, which constitutes an emissions performance factor of 0.018 $MTCO_2$ / MWh.

8. AB 32 requires CARB to adopt regulations that will reduce statewide GHG emissions, by the year 2020, to the 1990 level. Executive Order S-3-05 requires a further reduction, by the year 2050, to 80 percent below the 1990 level.

9. The California Renewable Portfolio Standard (RPS) requires the state's electric utilities obtain at least 33 percent of the power supplies from renewable sources, by the year 2020.

10. California's power supply loading order requires California utilities to obtain their power first from the implementation of all feasible and cost-effective energy efficiency and demand response, then from renewables and distributed generation, and finally from the most efficient available fossil-fired generation and infrastructure improvement.

11. There is no evidence in the record that construction or operation of AMS will be inconsistent with the loading order.

12. When it operates, AMS will displace generation from less-efficient (i.e., higher-heat-rate and therefore higher-GHG-emitting) power plants.

13. AMS will replace power from coal-fired power plants that will be unable to contract with California utilities under the SB 1368 EPS, and from once-through cooling power plants that must be retired.

14. AMS operation will reduce overall GHG emissions from the electricity system.

15. The role of fossil fuel-fired generation will diminish as technology advances, coupled with efficiency and conservation measures, make round-the-clock availability of renewables generation feasible.

CONCLUSIONS OF LAW

1. AMS construction-related GHG emissions will not cause a significant adverse environmental impact.

2. The GHG emissions from a power plant's operation should be assessed in the context of the operation of the entire electricity system of which the plant is an integrated part.

3. AMS operational GHG emissions will not cause a significant environmental impact.

4. As a renewable electricity generating facility, AMS is determined by rule to be compliant with SB 1368.

5. AMS operation will help California utilities meet their RPS obligations.

6. AMS operation will be consistent with California's loading order for power supplies.

7. AMS operation will foster the achievement of the GHG goals of AB 32 and Executive Order S-3-05.

8. The GHG emissions of any power plant must be assessed within the system on a case-by-case basis to ensure that the project will be consistent with the goals and policies enunciated above.

9. Any new power plant that we certify must:

    a) not increase the overall system heat rate;

    b) not interfere with generation from existing renewables or with the integration of new renewable generation; and

    c) have the ability to reduce system-wide GHG emissions.

B. AIR QUALITY

Construction and operation of Abengoa Mojave Solar (AMS) project will emit combustion products and use certain hazardous materials that could expose the general public and onsite workers to potential health effects. This section on air quality examines whether AMS will likely comply with applicable state and federal air quality LORS, whether it will likely result in significant air quality impacts, and whether the proposed mitigation measures will likely reduce potential impacts to insignificant levels.

The evidence describes the regulatory programs, standards, protocols, and analyses relevant to the project's air quality impacts. (6/28/10 RT 64-76, 7/15/10 RT 8-13[15]; Exs. 1, §5.2, Appendix C, 2, 3, 11, 13, 19, 26, 32, 39, 48, 49, 50, 302, § 5.1, 305.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

The federal Clean Air Act[16] and the California Clean Air Act[17] both require the establishment of ambient air quality standards (AAQS) for the maximum allowable concentrations of "criteria air pollutants." The California AAQS (CAAQS) established by the California Air Resources Board (CARB) are typically lower (more protective) than the National AAQS (NAAQS), which are established by the United States Environmental Protection Agency (U.S. EPA). (Ex. 302, p. 5.1-4.)

"Criteria air pollutants" include nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), lead, ozone (O_3), and inhalable/fine particulate matter (PM10/PM2.5). In addition, precursor pollutants for ozone include nitrogen oxides (NO_x, consisting of nitric oxide [NO] and NO_2) and volatile organic compounds (VOC). Precursors for particulate matter are primarily NO_x, sulfur oxides (SOx) and ammonia (NH_3). Greenhouse gas (GHG) emissions are discussed in the context of cumulative impacts. (Ex. 302, p. 5.1-1.)

---

[15] MDAQMD certified that the project complies with applicable air quality standards and does not require emission offsets. (Pub. Res. Code, § 25523 (d)(2).)

[16] Title 42, United States Code, section 7401 et seq.

[17] California Health and Safety Code, section 40910 et seq.

The federal and state AAQS consist of two parts: an allowable pollutant concentration and an averaging time over which the concentration is measured. The averaging times are based on whether the damage caused by the pollutant is more likely to occur during exposures to a high concentration for a short time (1 hour, for instance), or to a relatively lower average concentration over a longer period (8 hours, 24 hours, or 1 month). Staff's **AIR QUALITY Table 1** below**,** which replicates a table prepared by Staff, shows the federal and state standards. (Ex. 302, p. 5.1-5.)

Air Quality Table 1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	8 Hour	0.075 ppm [a] (147 µg/m^3)	0.070 ppm (137 µg/m^3)
	1 Hour	—	0.09 ppm (180 µg/m^3)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9.0 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual	0.053 ppm (100 µg/m^3)	0.03 ppm (57 µg/m^3)
	1 Hour	0.100 ppm[b]	0.18 ppm (339 µg/m^3)
Sulfur Dioxide (SO_2)	Annual	0.030 ppm (80 µg/m^3)	—
	24 Hour	0.14 ppm (365 µg/m^3)	0.04 ppm (105 µg/m^3)
	3 Hour	0.5 ppm (1300 µg/m^3)	—
	1 Hour	—	0.25 ppm (655 µg/m^3)
Particulate Matter (PM10)	Annual	—	20 µg/m^3
	24 Hour	150 µg/m^3	50 µg/m^3
Fine Particulate Matter (PM2.5)	Annual	15 µg/m^3	12 µg/m^3
	24 Hour	35 µg/m^3	—
Sulfates (SO_4)	24 Hour	—	25 µg/m^3
Lead	30 Day Average	—	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	—
Hydrogen Sulfide (H_2S)	1 Hour	—	0.03 ppm (42 µg/m^3)
Vinyl Chloride (chloroethene)	24 Hour	—	0.01 ppm (26 µg/m^3)
Visibility Reducing Particulates	8 Hour	—	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%.

Source: Ex. 302, p. 5.5-1.
Notes: [a] The 2008 standard is shown above, but as of September 16, 2009 this standard is being reconsidered. The 1997 8-hour standard is 0.08 ppm.
[b] The U.S. EPA is in the process of implementing this new standard, which became effective April 12, 2010. This standard is based on the 3-year average of the 98th percentile of the yearly distribution of 1-hour daily maximum concentrations.

The U.S. EPA has designated all areas of the U.S. as attainment (below NAAQS), nonattainment (exceeds NAAQS), or unclassifiable (insufficient data). An area may be attainment under the federal standard and nonattainment under the state standard for the same air contaminant. The Clean Air requires a periodic review of the standards to provide for necessary updates.[18] (Ex. 302, pp. 5.1-4 through 5.1-5.)

1. Existing Air Quality

AMS is located in the Mojave Desert Air Basin (MDAB) under the jurisdiction of the Mojave Desert Air Quality Management District (MDAQMD). As shown in **Air Quality Table 2**, which replicated a table prepared by Staff, the MDAB is designated nonattainment for the federal and state ozone and PM10 standards, and the state PM2.5 standard. The MDAB is designated attainment or unclassified for the state and federal CO, NO_x, and SO_x standards, and the federal PM2.5 standard. (Ex. 302, pp. 5.1-6, 5.1-34 et seq.)

Air Quality Table 2
MDAQMD Federal and State Attainment Status

Pollutant	**Attainment Status** [a]	
	Federal	*State*
Ozone	Moderate Nonattainment [b]	Moderate Nonattainment
CO	Attainment	Attainment
NO_2	Attainment [c]	Attainment
SO_2	Attainment	Attainment
PM10	Moderate Nonattainment	Nonattainment
PM2.5	Attainment	Nonattainment

Source: Ex. 302, p. 5.1-6.
Notes:[a] Attainment = Attainment or Unclassified, where Unclassified is treated the same as Attainment for regulatory purposes.
[b] MDAQMD has asked to be reclassified from moderate to severe-17 nonattainment of the federal 8-hour ozone standard (severe-17 allows 17 years to reach attainment).
[c] Nitrogen dioxide attainment status for the new federal 1-hour NO_2 standard is scheduled to be determined by January 2012.

2. MDAQMD's Final Determination of Compliance

MDAQMD released its Final Determination of Compliance about May 13, 2010, stating that the project is expected to comply with applicable Air District rules, which incorporate state and federal requirements. (Exs. 1, § 5.2.1.4, 302, p. 5.1-

[18] Ambient air quality standards are designed to protect the most sensitive members of the public, such as the elderly, young children, and asthmatics or others who are susceptible to respiratory disease. The standards also protect the public welfare, including the prevention of decreased visibility, and damage to animals, crops, and vegetation. (Ex. 302, pp. 5.1-4.)

38 et seq.) MDQAMD issued a revised FDOC (FDOC) dated July 1,2010, with revised permit conditions. (Ex. 305.) The MDAQMD's permit conditions for the project are specified in the FDOC and included in this Decision as a matter of law.[19] (Cal. Code Regs., tit. 20, §§ 1744.5, 1752.3.) See Conditions **AQ-1** through **AQ-59**, below. Condition **AQ-SC8** requires the project owner to notify the Energy Commission and the U.S EPA whenever the owner requests the Air District to modify the project's permit conditions.

3. CEQA Requirements

In addition to MDAQMD requirements, this Decision also evaluates air quality impacts under CEQA Guidelines, which identify significance criteria to determine whether a project will: (1) conflict with or obstruct implementation of the applicable air quality plan; (2) violate any air quality standard or contribute substantially to an existing violation; (3) result in a cumulatively considerable net increase of any criteria pollutant that is already in nonattainment; (4) expose sensitive receptors to substantial pollutant concentrations; and (5) create objectionable odors affecting a substantial number of people. (Cal Code Regs., tit. 14, § 15000 et seq., Appendix G.) The Guidelines note that the significance criteria established by the applicable Air District may be applied in a significance determination under CEQA review. (Ex. 302, p. 5.1-20.)

4. Methodology

The Applicant performed an air dispersion modeling analysis using MDAQMD and U.S. EPA approved computer models (AERMOD/AERMET, BPIP-PRIME and SCREEN3) to evaluate potential impacts on ambient air quality during project construction and operation. The analysis incorporates four years (2001-2004) of meteorological data collected in the site vicinity. (Exs. 1, § 5.2.4 et seq., Appendix C, 302, pp. 5.1-10, 5.1-20 et seq.)

5. Construction Impacts and Mitigation

The construction phase is temporary and will occur over a period of 26 months. Air pollutants will be generated from diesel exhaust emitted by heavy duty construction vehicles and equipment. In addition, fugitive dust will be caused by site grading/excavation activities, installation of new on-site transmission lines,

[19] The conditions include emissions limitations, operating limitations, offset requirements, and testing, monitoring, record keeping, and reporting requirements.

water and gas pipelines, construction of power plant facilities, roads, and substations, and vehicle travel on paved/unpaved roads. (Ex. 302, p. 5.1-12.)

Air Quality Table 3 below, replicated from a Staff-prepared table, represents Staff's recalculation of Applicant's estimated pollutant emissions over the 26-month construction period. In recalculating Applicant's estimates, Staff incorporated the most conservative assumptions for diesel exhaust and fugitive dust to ensure that the estimated construction emission levels were reliable. Using Staff's conservative modeling assumptions, the results shown in Table 8 do not trigger a federal Clean Air Act General Conformity review, which would apply to thresholds of 100 tons per year for NO_x, VOC, and PM10. (Ex. 302, pp. 5.1-13 to 5.1-14, 5.1-24, 5.1-38.)

Air Quality Table 3
AMS Construction – Staff's Emissions Estimate

	NO_x	SO_x	CO	VOC	PM10	PM2.5
Maximum Daily Emissions (lb/day) [a]						
Onsite Construction Equipment	598.4	0.6	841.0	240.4	31.2	29.6
Onsite Fugitive dust	---	---	---	---	1,102.0	211.4
Subtotal of Onsite Emissions	598.4	0.6	841.0	240.4	1,133.2	240.0
Offsite Vehicle Emissions	135.9	0.7	475.5	53.3	7.8	6.8
Offsite Fugitive Dust Emissions	---	---	---	---	29.9	0.0
Subtotal of Offsite Emissions	135.9	0.7	475.5	53.3	37.7	6.8
Maximum Daily Total	734.4	1.3	1,316.6	293.7	1,170.9	247.8
Maximum Annual Emissions (tons/year) [b]						
Onsite Construction Equipment	47.5	0.0	61.8	19.2	2.8	2.6
Onsite Fugitive dust	---	---	---	---	78.7	14.9
Subtotal of Onsite Emissions	47.5	0.0	61.8	19.2	81.4	17.5
Offsite Vehicle Emissions	17.2	0.1	75.1	7.7	1.1	0.8
Offsite Fugitive Dust Emissions	---	---	---	---	3.9	0.0
Subtotal of Offsite Emissions	17.2	0.1	75.1	7.7	4.9	0.8
Maximum Annual Total	64.7	0.2	136.9	26.9	86.3	18.3

Source: Ex. 302, p. 5.1-13.
[a] - Maximum daily and monthly emissions for all criteria would occur during Month 6, except PM10 which would have its peak emissions during Month 5.
[b] – Maximum annual emissions (worst-case consecutive twelve month period for onsite and offsite emissions) do not occur during the same periods for all pollutants: for PM10 and PM2.5 the peak occurs during months 1 to 12; for NOx the peak occurs during months 2 through 13; for VOC the peak occurs during months 4 through 15; for CO the peak occurs during months 6 through 17; and for SOx the peak occurs during months 10 through 21 of the 26 month construction schedule.

Air Quality Table 4 below, replicated from a Staff-prepared table,shows the estimated construction emission impacts based on the results in **Air Quality Table 3**. This impacts analysis indicates, with the exception of 24-hour and annual PM10 impacts, that project construction will not create new exceedances or contribute to existing exceedances for any of the modeled air pollutants. However, the conditions that create worst-case project modeled impacts (low wind speeds) are not the same conditions where the ambient background is nonattainment for PM10. Although the worst-case predicted PM10 impacts occur at the fence line and drop off quickly with distance from the fence line, there is potential for near-field nuisance impacts to residents located at or near the project fence. (Ex. 302, p. 5.1-24.)

Air Quality Table 4
Maximum Project Construction Impacts

Pollutants	Avg. Period	Impacts (ug/m^3)	Background [a] (ug/m^3)	Total Impact (ug/m^3)	Standard (ug/m^3)	Percent of Standard
NO_2	1-hr	177	152.6	329.6	339	97%
	Annual	1.8	38.0	39.8	57	70%
PM10	24-hr	72	76	148	50	296%
	Annual	1.8	29.8	31.6	20	158%
PM2.5	24-hr	15	19	34	35	97%
	Annual	0.45	9.7	10.2	12	85%
CO	1-hr	94	1,610	1,704	23,000	7%
	8-hr	31	1,367	1,398	10,000	14%
SO_2	1-hr	0.18	23.6	23,8	665	4%
	3-hr	0.08	15.6	15.7	1300	1%
	24-hr	0.03	13.1	13.1	105	13%
	Annual	0.003	2.7	2.7	80	3%

Source: Ex. 302, p. 5.1-24
Note:[a] Background values have been adjusted per staff recommended background concentrations shown in Staff's Air Quality Table 5 in Ex. 302, p. 5.1-10

Construction PM10 Impacts. Although the Air District does not require mitigation for construction emissions, the project's unmitigated construction activities will likely contribute to nonattainment PM10 and ozone conditions in the MDAB. (Exs. 1, § 5.2.1.4, 302, p. 5.1-24.) The project's on-site impacts are expected to exceed the 24-hour and annual threshold for PM10. Therefore, the project's contribution to existing adverse air quality would be considered a significant impact under CEQA, if left unmitigated. In this context, Staff and the Applicant proposed several mitigation measures to reduce construction emissions to insignificant levels. (Exs. 1, § 5.2.2.6, 302, p. 5.1-25 et seq.) We have incorporated these measures in the following Conditions of Certification.

Construction Mitigation. Conditions **AQ-SC1** and **AQ-SC2** require the project owner to prepare and implement an Air Quality Construction Mitigation Plan (AQCMP) and to employ a construction mitigation manager to monitor compliance with the AQCMP. (Ex. 302, pp. 5.1-26-5.1-27.)

Condition **AQ-SC3** includes fugitive dust control requirements, which include paving the main access road to the main power block prior to construction, using durable non-toxic soil stabilizers on unpaved plant roads as soon as they are constructed, and using water trucks to wet the soils during earthmoving activities. Condition **AQ-SC4** limits potential off-site impacts from visible dust emissions. (Ex. 302, p. 5.1-27.)

Condition **AQ-SC5** requires the project owner to reduce PM and NO_x emissions from large diesel-fueled construction equipment by using EPA/ARB Tier 3 engine compliant equipment for engines between 50 and under 750 horsepower (hp) and Tier 2 emission standards for engines over 750 hp. This Condition also includes equipment idle time restrictions and engine maintenance provisions. (Ex. 302, p. 5.1-27.)

Condition **AQ-SC9** requires the project owner to pay for offsite lodging, if requested, during initial site grading for residents located within 0.25 mile of the project fence line. This measure is necessary because the worst-case predicted PM10 impacts occur where residences are located adjacent to and near the project fence line. Staff maintains that the emission estimate shown in Table 3, above, is likely underestimated for the early earthmoving/grading phase of construction, thus creating the potential for nuisance dust emissions within 0.25 mile of earthmoving activities. Staff recommended that Applicant pay residents for equivalent lodging during the initial grading phase when the maximum particulate impacts could occur. We have adopted this proposal because it provides the most immediate and protective mitigation for construction-related emissions. (Ex. 302, pp. 5.1-27—5.1-28.)

6. Operation Impacts and Mitigation

As previously discussed in this Decision, the AMS project is a 250 MW solar facility spread across 1,765 acres. The direct air pollutant emissions from power generation are minimal; however, emissions from necessary auxiliary equipment and maintenance activities require mitigation. The facility includes two 125 MW power blocks, which consist of the following stationary operating equipment:

- Two 21.5 MMBtu natural gas-fueled auxiliary HTF heaters, one per power block, used to maintain the temperature of the HTF above freezing during cold months and pre-warming for daily startup year-round;
- Two 6-cell wet-cooling towers, one per power block, each to provide cooling and heat rejection from a single power block process;
- Two 346-hp diesel-fired emergency fire water pump engines, one per power block;
- Two 4,160-hp diesel engine-driven emergency generators, one per power block;
- One 2,000 gallon gasoline tank and one 2,000 gallon diesel tank that would refuel onsite dedicated vehicles for both power blocks;
- Eight HTF expansion vessels and two HTF overflow tanks on each power block, that would be serviced by HTF venting control systems;
- Two separate HTF piping systems for each power block with a total facility component count of 3,247 valves, 8,120 flanges/connectors[20], 24 pump seals, and 16 pressure relief valves.
- Spent HTF waste loadout[21];
- Two bio-remediation/ land farm units, one per power block, to treat HTF contaminated soils; and
- On-site diesel and gasoline fueled maintenance vehicles used for mirror washing and other maintenance/operation support activities. (Ex. 302, p. 5.1-14.)

The Applicant modeled the air pollutant emissions from the project's stationary equipment based on manufacturers' specifications using peak estimated on-site hourly, daily and annual operating emissions to determine potential impacts. (Ex. 1, § 5.2.2.4, Tables 5.2-3, 5.2-4, 5.2-5, 5.2-6, 5.2-7.) The predicted concentration levels were then added to existing ambient pollutant concentration levels to determine the cumulative effect. All modeling results with the exception of 24-hour and annual PM10 were below the pollutants' significant impact levels. Maximum combined impacts (modeled pus ambient background) exceed the

[20] Staff increased the number of flanges/connectors to a value of 4,060 per unit to be consistent with the component count ratios of other currently analyzed projects using HTF piping systems. This revision has a very minor effect on the emission estimate for the HTF piping system. (Ex. 302, p. 5.1-14.)

[21] Negligible emissions from spent HTF waste load out, bioremediation/land farm units, and diesel tanks do not require MDAQMD permitting and are not included in the VOC emission estimates for the facility. (Ex. 302, p. 5.1-14.)

AAQS only when background concentrations already exceed the applicable standards, specifically, the PM10 24-hour CAAQS and NAAQS and the PM10 annual CAAQS. (*Id*., § 5.2.4.9, Table 5.2-7.)

Air Quality Table 5 below, which replicates a Staff-prepared table, summarizes the results of the modeling analysis. Staff notes that the maximum 1-hour NO_2 concentration was not based on the ozone limiting method (OLM) calculation or any other method to determine the NO_2/NO_x ratio, resulting in the assumption that all NO_x emissions are NO_2 and overstating maximum NO_2 impacts. (Ex. 302, p. 5.1-29.)

Air Quality Table 5
Maximum Project Operation Emission Impacts

Pollutants	Avg. Period	Impacts (ug/m^3)	Background [a] (ug/m^3)	Total Impact (ug/m^3)	Standard (ug/m^3)	Percent of Standard
NO_2	1-hr	130	152.6	282.6	339	83%
	1-hr Fed	--	--	184.3[b]	188	98%
	Annual	0.18	38.0	38.2	57	67%
PM10	24-hr	8.8	76	84.8	50	170%
	Annual	2.3	29.8	32.1	20	161%
PM2.5	24-hr	4.4	19	23.4	35	67%
	Annual	0.7	9.7	10.4	12	87%
CO	1-hr	76	1,610	1,686	23,000	7%
	8-hr	7.8	1,367	1,375	10,000	14%
SO_2	1-hr	0.25	23.6	23.9	665	4%
	3-hr	0.18	15.6	15.8	1300	1%
	24-hr	0.07	13.1	13.2	105	13%
	Annual	0.003	2.7	2.7	80	3%

Source: Ex. 302, p. 5.1-29.
Note:[a] Background values have been adjusted per Staff's recommended background concentrations shown in Staff's **Air Quality Table 5** at Ex. 302, p. 5.1-8.
[b] The applicant's modeling results for this new federal standard includes actual hourly background so only the total maximum impact determined as the maximum three-year average of the 98th percentile of daily maximums is presented.

Operation PM10 Impacts. The modeling analysis indicates that the maximum PM10 impacts occur at the site fence line but are considered significant when combined with diesel emissions and fugitive dust from maintenance vehicles, which will continue to impact local and upwind receptors during the 30-year life of the project. (Exs. 1, § 5.2.4.9, 302, p. 5.1-32.)

Operation PM2.5 Impacts. Secondary particulate formation, which is assumed to be 100 percent PM2.5, is the process of conversion from gaseous reactants (NO_x and SO_x) to particulate products. In "ammonia poor" environments such as the MDAB, where insufficient ammonia exists in the atmosphere to establish a balance, reactants create additional ammonia that increases PM2.5

concentrations. Staff reviewed available chemical characterization data from the Mojave area, which shows that ammonium nitrate and ammonium sulfate fine particulate concentrations in China Lake, Edwards Air Force Base, and Mojave in 2000 constituted 40 percent of the ambient PM2.5 on an annual average. Based on this data, Staff asserted that project emissions of NO_x and SO_x have the potential (if left unmitigated) to contribute to higher PM2.5 levels in the region. (Ex. 302, p. 5.1-33.)

Operation Ozone Impacts. Staff also found that the project's NO_x and VOC emissions have the potential (if left unmitigated) to contribute to higher ozone levels in the region. These potential impacts are considered cumulatively significant under CEQA because they will contribute to ongoing violations of the ozone AAQS. (Ex. 302, p. 5.1-32.)

Operation Mitigation. The MDAQMD requires the project to mitigate the project's stationary source NO_x, VOC, SO_2, and PM10/PM2.5 emissions by using Best Available Control Technology (BACT) as described in Conditions **AQ-1** through **AQ-59**.[22] (Exs. 1, § 5.2.3 et seq, 302, pp. 5.1-30 - 5.1-31, 305.) In addition, due to Staff's concerns regarding PM10/PM2.5 and ozone impacts under CEQA, Conditions **AQ-SC6 and AQ-SC7** require the project owner to purchase new, low emission maintenance vehicles and to employ fugitive dust controls during operation to further reduce emissions of NO_x, VOC, and particulate matter. (Ex. 302, pp. 5.1-32—5.1-33.)

7. Cumulative Impacts

Cumulative impacts may result from the project's incremental effect, together with other closely related past, present and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project. (Pub. Res. Code § 21083; Cal. Code Regs., tit. 14, §§ 15064(h), 15130, 15355.)

The air quality analysis is concerned with criteria air pollutants, which have impacts that are typically cumulative by nature. Although a project by itself would rarely cause a violation of a federal or state criteria pollutant standard, a new source of pollution may contribute to violations of criteria pollutant standards in

[22] Notably, the MDAQMD does not require emission reduction credits (ERCs) to offset the project's emissions due to the relatively low stationary source emission levels. (Ex. 302, p. 5.1-39.)

the context of existing background pollutant sources or foreseeable future projects. (Ex. 302, p. 5.1-34.)

The record provides an extensive analysis of the project's potential cumulative air quality impacts, including a description of the air quality background in the northwestern San Bernardino County portion of the MDAB and discusses historical ambient levels for each of the assessed criteria pollutants. (Ex. 302, pp. 5.1-34 - 5.1-35.)

The record also contains a summary of the MDAQMD's projections for criteria pollutants and its programmatic efforts to abate such pollution, as well as an analysis of the project's localized cumulative impacts and the project's direct operating emissions combined with other local major emission sources. (Ex. 302, p. 5.1-35.)

The Applicant, in consultation with Staff and the MDAQMD, surveyed new development and stationary sources that are either under construction or are permitted to begin construction and have the potential to emit criteria air contaminants within 6 miles of the project site. The survey results indicate that no such sources exist within the 6-mile radius of the site. (Ex. 302, pp. 5.1-36 - 5.1-37.)

However, there are several dozen pending solar, wind, and other projects in the MDAB west of Barstow. These projects include two large thermal solar projects (Beacon Solar Energy and Ridgecrest Solar Power) and two large gas-fired turbine/solar hybrid projects (Palmdale Hybrid Power Plant and Victorville 2 Hybrid Power) that are currently either in the licensing process or already approved by the Energy Commission. In conjunction with development of these new energy projects in the air basin and the corresponding increase in air basin emissions, it is likely that the AMS will contribute cumulatively to regional ozone and particulate matter in the MDAB. Conditions **AQ-SC6** and **AQ-SC7** are designed to control onsite vehicle emissions and fugitive dust during operation of the AMS to reduce its cumulative air quality impacts to insignificant levels. (Ex. 302, pp. 5.1-33, 5.1-37.)

Odor, Soils, Sensitive Species. There is no evidence of significant nuisance odors due to project activities. Nor is there evidence of any significant adverse air quality impacts on soils, vegetation or sensitive species. (Ex. 1, § 5.2.2.6, p. 5.2-15, § 5.2.4.10.)

Environmental Justice. Since the project's potential air quality impacts will be mitigated to insignificant levels for all members of the public in the project vicinity, there are no disproportionate impacts on low-income/minority populations and therefore, no environmental justice issues in this case. (Ex. 302, p. 5.1-37.) See the **Socioeconomics** section of this Decision for further discussion of environmental justice.

8. Public and Agency Comments

No public or agency comments were received.

FINDINGS AND CONCLUSIONS

Based on the record, we find as follows:

1. The AMS project is located in the Mojave Desert Air Basin and is under the jurisdiction of the Mojave Desert Air Quality Management District (MDAQMD).

2. MDAQMD released its Final Determination of Compliance (FDOC) about May 13, 2010, stating that the project will comply with applicable Air District rules, which incorporate state and federal requirements. MDAQMD released a revised FDOC about July 1, 2010, with revised permitting conditions.

3. The AMS project area is designated nonattainment for the federal and state ozone and PM10 ambient air quality standards and the state PM2.5 standard, and attainment or unclassified for the federal and state CO, NO_x, and SO_x standards and the federal PM2.5 standard.

4. Although the MDAQMD does not require mitigation for construction-related emissions, the project's unmitigated vehicle/equipment diesel exhaust and fugitive dust generated during construction will exceed daily significance thresholds for NO_x and PM10, as well as the annual threshold for PM10, and constitute significant impacts under CEQA

5. The mitigation measures contained in Conditions **AQ-SC1** through **AQ-SC-5** and **AQ-SC-9** are designed to reduce the project's construction-related air quality impacts to insignificant levels under CEQA.

6. The project's direct air pollutant emissions from solar power generation are minimal; however, project-related emissions of NO_x, VOC, SO_2 and PM10/2.5 from stationary source auxiliary equipment and maintenance vehicle exhaust during operation will contribute to violations of federal and state PM10/2.5 and ozone standards.

7. The MDAQMD requires the project to mitigate stationary source NO_x, VOC, SO_2, and PM10/PM2.5 emissions by employing Best Available Control Technology (BACT).

8. Conditions **AQ-SC6** and **AQ-SC7** require the project to use low emission maintenance vehicles and fugitive dust controls during operation to further reduce NO_x, VOC, and PM10/2.5 emissions to insignificant levels under CEQA.

9. The record contains an adequate analysis of the project's potential contributions to cumulative air quality impacts.

10. The mitigation measures contained in the Conditions of Certification, below, in conjunction with similar measures employed by other renewable power plants in the desert region will mitigate the project's contributions to regional ozone and particulate matter to insignificant levels.

11. There is no evidence that project-related air emissions will result in significant nuisance odors or any significant air quality impacts on soils, vegetation or sensitive species

CONCLUSIONS OF LAW

1. Implementation of the mitigation measures described in the record and contained in the following Conditions of Certification are sufficient to ensure that AMS will conform with all applicable laws, ordinances, regulations, and standards relating to air quality as set forth in the pertinent portions of **Appendix A** of this Decision.

2. Implementation of the mitigation measures described in the record and contained in the Conditions of Certification ensures that the project will not result in significant direct, indirect, or cumulative air quality impacts in conformance with NEPA and CEQA requirements.

CONDITIONS OF CERTIFICATION

COMMISSION CONDITIONS OF CERTIFICATION

AQ-SC1 Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with Conditions of Certification **AQ-SC3**, **AQ-SC4** and **AQ-SC5** for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM Delegates. The AQCMM and AQCMM Delegates shall have full access to all areas of construction

on the project site and linear facilities, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM Delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall not be terminated without written consent of the Compliance Project Manager (CPM).

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

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

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

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

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

b. All unpaved construction roads and unpaved operation and maintenance site roads, as they are being constructed, shall be stabilized with a non-toxic soil stabilizer or soil weighting agent that

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

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

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

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

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

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

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

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

j. All paved roads within the construction site shall be swept daily or as needed (less during periods of precipitation) on days when

construction activity occurs to prevent the accumulation of dirt and debris.

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

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

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

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

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

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

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

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

AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM Delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported (A) off the project site and within 400 feet upwind of any regularly occupied structures not owned by the project owner or (B) 200 feet beyond the centerline of the construction of linear facilities indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMP shall include a section detailing how the additional mitigation measures will be accomplished within the time

limits specified. The AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

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

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

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

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

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

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

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

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

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

b. All construction diesel engines with a rating of 50 hp or higher and lower than 750 hp shall meet, at a minimum, the Tier 3 California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless a good faith effort to the satisfaction of the CPM that is certified by the on-site AQCMM demonstrates that such engine is not available for a particular item of equipment. Engines larger than 750 hp shall meet Tier 2 engine standards. In the event that a Tier 3 engine is not available for any off-road equipment larger than 50 hp and smaller than 750 hp, that equipment shall be equipped with a Tier 2 engine, or an engine that is equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides (NOx) and diesel particulate matter (DPM) to no more than Tier 2 levels unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices is “not practical” for the following, as well as other, reasons.

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

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

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

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

   1. The use of the retrofit control device is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power

output due to an excessive increase in back pressure.

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

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

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

d. All heavy earth-moving equipment and heavy duty construction-related trucks with engines meeting the requirements of (b) above shall be properly maintained and the engines tuned to the engine manufacturer's specifications.

e. All diesel heavy construction equipment shall not idle for more than five minutes. Vehicles that need to idle as part of their normal operation (such as concrete trucks) are exempted from this requirement.

f. Construction equipment will employ electric motors when feasible.

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

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

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

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

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

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

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

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

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

The site operations fugitive dust control plan shall include the use of durable non-toxic soil stabilizers on all regularly used unpaved roads and disturbed off-road areas, or alternative methods for stabilizing disturbed off-road areas, within the project boundaries, and shall include the inspection and maintenance procedures that will be undertaken to ensure that the unpaved roads remain stabilized. The soil stabilizer used shall be a non-toxic soil stabilizer or soil weighting agent that can be determined to be as efficient as or more efficient for fugitive dust control than ARB approved soil stabilizers, and that shall not increase any other environmental impacts, including loss of vegetation to areas beyond where the soil stabilizers are being applied for dust control.

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

Verification: At least 30 days prior to start of commercial operation, the project owner shall submit to the CPM for review and approval a copy of the site Operations Dust Control Plan that identifies the dust and erosion control procedures, including effectiveness and environmental data for the proposed soil stabilizer, that will be used during operation of the project and that identifies all locations of the speed limit signs. Within 60 days after commercial operation, the project owner shall provide to the CPM a report identifying the locations of all speed limit signs, and a copy of the project employee and contractor training

manual that clearly identifies that project employees and contractors are required to comply with the dust and erosion control procedures and on-site speed limits.

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

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

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

AQ-SC9 The project owner shall 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 to the CPM, prior to the start of initial grading, a statement signed by the project owner's project manager stating that the owner or residents of the properties affected by this condition have been notified and that the residents have been offered by the project owner paid relocation during the affected period of the initial grading/site preparation phase of construction. The statement shall list affected property 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 evaluate those requests.

DISTRICT CONDITIONS

District Final Determination of Compliance Conditions. (See Ex. 305.)

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.

AQ-2 This equipment shall be exclusively fueled with pipeline quality natural gas and shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

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

AQ-3 Emissions from this equipment shall not exceed the following hourly emission limits, verified by fuel use and an initial or annual compliance tests as applicable for each pollutant:

a. NOx as NO_2:

0.237 lb/hr operating at 100% load (based on 9.0 ppmvd corrected to 3% O2 and averaged over one hour)

b. CO:

0.817 lb/hr operating at 100% load (based on 50 ppmvd corrected to 3% O2 and averaged over one hour)

c. VOC as CH_4:

0.231 lb/hr operating at 100% load

d. SOx as SO_2:

0.0126 lb/hr operating at 100% load

e. PM10/2.5:

0.159 lb/hr operating at 100% load

Verification: As part of the Annual Compliance Report, the project owner shall include information demonstrating compliance with boiler operating emission rates.

AQ-4 Prior to the expiration date each year, after the completion of construction the project owner shall have this equipment tuned, as specified by Rule 1157(I), Tuning Procedure.

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

AQ-5 The project owner shall maintain an operations log for this equipment on-site and current for a minimum of five (5) years, and said log shall be provided to District personnel on request. The operations log shall include the following information at a minimum:

a. Cumulative annual fuel use in cubic feet or operation in hours;

b. Annual tune-up verification;

c. Results of annual compliance testing;

d. Any permanent changes made to the equipment that would affect air pollutant emissions, and indicate when changes were made.

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

AQ-6 The project owner shall perform initial compliance tests on this equipment in accordance with the MDAQMD Compliance Test Procedural Manual. The test report shall be submitted to the District within 180 days of initial start up:

a. NOx as NO_2 in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Methods 19 and 20).

b. VOC as CH_4 in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Methods 25A and 18).

c. CO in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Method 10).

d. PM10/2.5 in mg/m^3 at 3% oxygen and lb/hr (measured per USEPA Reference Methods 5 and 202 or CARB Method 5).

e. Flue gas flow rate in dscf per minute.

f. Opacity (measured per USEPA reference Method 9).

Verification: The project owner shall notify the District and the CPM within fifteen (15) working days before the execution of the compliance test required in this condition. The test results shall be submitted to the District and to the CPM within 180 days of initial start up.

AQ-7 The project owner shall perform annual compliance tests on this equipment in accordance with the MDAQMD Compliance Test Procedural Manual. The test report shall be submitted to the District no later than six weeks prior to the expiration date of this permit. The following compliance tests are required:

a. NOx as NO_2 in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Methods 19 and 20).

b. CO in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Method 10).

Verification: The project owner shall notify the District and the CPM within fifteen (15) working days before the execution of the compliance test required in this condition. The test results shall be submitted to the District and to the CPM within the timeframe required by this condition.

AQ-8 Annual fuel usage shall not exceed 45.9 MMscf verified by annual fuel usage records.

Verification: As part of the Annual Compliance Report, the project owner shall include information demonstrating compliance with boiler annual fuel use limit.

APPLICATION NO. 00010906 AND 00010907 (TWO - HTF ULLAGE/EXPANSION SYSTEM)

EQUIPMENT DESCRIPTION

Two HTF ullage/expansion systems.

AQ-9 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.

AQ-10 This system shall store only HTF, specifically the condensable fraction of the vapors vented from the ullage system.

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

AQ-11 The expansion tanks (5), nitrogen-condensing tank and two vertical HTF storage tanks shall be operated at all times under a nitrogen blanket.

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

AQ-12 The ullage/expansion system nitrogen venting shall be carried out only through vents which have vapor condensing coolers which shall be maintained at or below 120 degrees Fahrenheit.

Verification: The project owner shall provide the District and CPM manufacturer design specifications showing compliance with this condition at least 30 days prior to the installation of the ullage/expansion vent system. The project owner shall have active temperature gauges that can be inspected to show compliance with this condition.

AQ-13 The HTF storage tank shall have in place a properly operating liquid HTF air cooler which shall maintain the tank at or below 165 degrees Fahrenheit.

Verification: The project owner shall provide the District and CPM manufacturer design specifications showing compliance with this condition at least 30 days prior to the installation of the HTF storage tanks. The project owner shall have active temperature gauges that can be inspected to show ongoing compliance with this condition.

AQ-14 The nitrogen condensing tanks shall be maintained at or below 176 degrees Fahrenheit.

Verification: The project owner shall provide the District and CPM manufacturer design specifications showing compliance with this condition at least 30 days prior to the installation of the nitrogen condensing tanks. The project owner shall have active temperature gauges that can be inspected to show ongoing compliance with this condition.

AQ-15 Vent release and HTF storage tank temperatures shall be monitored in accordance with a District approved Inspection, Monitoring and Maintenance plan.

Verification: The project owner shall provide the District for review and approval and the CPM for review the required Inspection, Monitoring and Maintenance plan at least 30 days prior to the installation of the HTF storage tanks and vent systems.

AQ-16 The project owner shall establish an inspection and maintenance program to determine, repair, and log leaks in HTF piping network and expansion tanks. Inspection and maintenance program and documentation shall be available to District staff upon request.

a. All pumps, compressors and pressure relief devices (pressure relief valves or rupture disks) shall be electronically, audio, or visually inspected once every operating day.

b. All accessible valves, fittings, pressure relief devices (PRDs), hatches, pumps, compressors, etc. shall be inspected quarterly using a leak detection device such as a Foxboro OVA 108 calibrated for methane.

c. Inspection frequency for accessible components, except pumps, compressors and pressure relief valves, may be changed from quarterly to annual when two percent or less of the components within a component type are found to leak during an inspection for five consecutive quarters.

d. Inspection frequency for accessible components, except pumps, compressors and pressure relief valves, shall be increased to quarterly when more than two percent of the components within a component type are found to leak during any inspection or report.

e. If any evidence of a potential leak is found the indication of the potential leak shall be eliminated within 7 calendar days of detection.

f. VOC leaks greater than 10,000-ppmv shall be repaired within 24-hours of detection.

g. After a repair, the component shall be re-inspected for leaks as soon as practicable, but no later than 30 days after the date on which the component is repaired and placed in service.

h. The project owner shall maintain a log of all VOC leaks exceeding 10,000-ppmv, including location, component type, date of leak detection, emission level (ppmv), method of leak detection, date of repair, date and emission level of reinspection after leak is repaired.

i. The project owner shall maintain records of the total number of components inspected, and the total number and percentage of leaking components found, by component types made.

j. The project owner shall maintain record of the amount of HTF replaced on a monthly basis for a period of five (5) years.

Verification: The inspection and maintenance plan shall be submitted to the CPM for review and approval at least 30 days before taking delivery of the HTF. As part of the Annual Compliance Report, the project owner shall provide the quantity of used HTF fluid removed from the system and the amount of new HTF fluid added to the system each year. The project owner shall make the site available for inspection of HTF piping Inspection and Maintenance Program records and HTF system equipment by representatives of the District, ARB, and the Energy Commission.

AQ-17 The project owner shall submit to the District a compliance test protocol within sixty (60) days of start-up and shall conduct all required compliance/certification tests in accordance with a District-approved test plan. Thirty (30) days prior to the compliance/certification tests the

project owner shall provide a written test plan for District review and approval. Written notice of the compliance/certification test shall be provided to the District ten (10) days prior to the tests so that an observer may be present. A written report with the results of such compliance/certification tests shall be submitted to the District within forty-five (45) days after testing.

Verification: The project owner shall provide a compliance test protocol to the District for approval and CPM for review at least no later than sixty (60) days after start-up and submit a test plan to the District for approval and CPM for review at least thirty (30) days prior to the compliance tests. The project owner shall notify the District and the CPM within ten (10) working days before the execution of the compliance tests required in **AQ-18** and **AQ-19**, and the test results shall be submitted to the District and to the CPM within forty-five (45) days after the tests are conducted.

AQ-18 The project owner shall perform the following initial compliance tests on this equipment in accordance with the MDAQMD Compliance Test Procedural Manual. The test report shall be submitted to the District within 180 days of initial start up. The following compliance tests are required:

a. VOC as CH_4 in ppmvd and lb/hr (measured per USEPA Reference Methods 25A and 18 or equivalent).

b. Benzene in ppmvd and lb/hr (measured per CARB method 410 or equivalent).

Verification: The project owner shall submit the test results to the District and to the CPM within 180 days after initial start up.

AQ-19 The project owner shall perform the following annual compliance tests on this equipment in accordance with the MDAQMD Compliance Test Procedural Manual. The test report shall be submitted to the District no later than six weeks prior to the expiration date of this permit. The following compliance tests are required:

a. VOC as CH_4 in ppmvd and lb/hr (measured per USEPA Reference Methods 25A and 18 or equivalent).

b. Benzene in ppmvd and lb/hr (measured per CARB method 410 or equivalent).

Additionally, records of all compliance tests shall be maintained on site for a period of five (5) years and presented to District personnel upon request.

Verification: As part of the Annual Compliance Report, the project owner shall include the test results demonstrating compliance with this condition and the project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-20 Emissions from this equipment may not exceed the following emission limits, based on a calendar day summary:

a. VOC as CH_4 – 4.55 lb/day, verified by compliance test.

b. Benzene – 1.9 lb/day, verified by compliance test.

Verification: As part of the Annual Compliance Report, the project owner shall include the test results demonstrating compliance with this condition and the project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-21 If current non-criteria substances become regulated as toxic or hazardous substances and are used in this equipment, the project owner shall submit to the District a plan demonstrating how compliance will be achieved and maintained with such regulations.

Verification: The project owner shall submit a compliance plan of the toxic or hazardous substances for District approval and CPM review if current non-criteria substances in the HTF become regulated as toxic or hazardous substances.

APPLICATION NO. 00010947 AND 00010948 (TWO COOLING TOWERS)

EQUIPMENT DESCRIPTION

Two 6-cell cooling towers with drift eliminator rate of 0.0005% and water circulation rate of 90,000 gpm.

AQ-22 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 and equipment by representatives of the District, ARB, and the Energy Commission.

AQ-23 This equipment shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

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

AQ-24 The drift rate shall not exceed 0.0005 percent with a maximum circulation rate of 90,000 gallons per minute. The maximum hourly PM10 emission rate shall not exceed 2.24 pounds per hour, as calculated per the written District-approved protocol.

Verification: The manufacturer guarantee data for the drift eliminator, showing compliance with this condition, shall be provided to the CPM and the District 30

days prior to cooling tower operation. As part of the Annual Compliance Report the project owner shall include information on operating emission rates to demonstrate compliance with this condition.

AQ-25 The project owner shall perform weekly specific conductivity tests of the blow-down water to indirectly measure total dissolved solids (TDS). Quarterly tests of the blow-down water will be done to confirm the relationship between conductance and TDS. The TDS shall not exceed 10,000 ppm on a calendar monthly basis.

Verification: The cooling tower recirculation water TDS content test results shall be provided to representatives of the District, ARB, and the Energy Commission upon request.

AQ-26 The project owner shall conduct all required cooling tower water tests in accordance with a District-approved test and emissions calculation protocol. Thirty (30) days prior to the first such test the project owner shall provide a written test and emissions calculation protocol for District review and approval.

Verification: The project owner shall provide an emissions calculation and water sample testing protocol to the District for approval and CPM for review at least 30 days prior to the first cooling tower water test.

AQ-27 This equipment shall not be operated for more than 5,840 hours per rolling twelve month period.

Verification: The project owner shall submit to the CPM the cooling tower operating data demonstrating compliance with this condition as part of the Annual Operation Report.

AQ-28 The project owner shall maintain an operations log for this equipment on-site and current for a minimum of five (5) years, and said log shall be provided to District personnel on request. The operations log shall include the following information at a minimum:

a. Total operation time (hours per day, hours per month, and hours per rolling twelve month period); and

b. The date and result of each blow-down water test in TDS ppm, and the resulting mass emission rate.

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

AQ-29 A maintenance procedure shall be established that states how often and what procedures will be used to ensure the integrity of the drift eliminators. This procedure is to be kept onsite and available to District personnel on request.

Verification: The project owner shall make available at request the written drift eliminator maintenance procedures for inspection by representatives of the District, ARB, and the Energy Commission.

APPLICATION NO. 00010712 AND 00010713 (TWO - 4,190 HP EMERGENCY IC ENGINE)

EQUIPMENT DESCRIPTION

Two - 190 HP diesel fueled emergency generator engines, each driving a generator.

AQ-30 This equipment shall be installed, operated and maintained in strict accord with those recommendations of the manufacturer/supplier and/or sound engineering principles which produce the minimum emissions of contaminants. Unless otherwise noted, this equipment shall also be operated in accordance with all data and specifications submitted with the application for this permit.

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

AQ-31 This unit shall only be fired on ultra-low sulfur diesel fuel, whose sulfur concentration is less than or equal to 0.0015% (15 ppm) on a weight per weight basis per CARB Diesel or equivalent requirements.

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

AQ-32 A non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed and maintained on this unit to indicate elapsed engine operating time. (Title 17 CCR §93115.10(e)(1)).

Verification: At least thirty (30) days prior to the installation of the engine, the project owner shall provide the District and the CPM the specification of the hour meter.

AQ-33 This unit shall be limited to use for emergency power, defined as in response to a fire or when utility back-feed power is not available. In addition, this unit shall be operated no more than 0.5 hours per day and 50 hours per year for testing and maintenance, excluding compliance source testing. Time required for source testing will not be counted toward the 50 hour per year limit.

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

AQ-34 The project owner shall maintain a operations log for this unit current and on-site, either at the engine location or at a on-site location, for a minimum of two (2) years, and for another year where it can be made available to the District staff within five (5) working days from the District's request, and this log shall be provided to District, State and Federal personnel upon request. The log shall include, at a minimum, the information specified below:

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

b. Reason for use (testing & maintenance, emergency, required emission testing);

c. Calendar year operation in terms of fuel consumption (in gallons) and total hours; and,

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

Verification: The project owner shall submit records required by this condition that demonstrating compliance with the sulfur content and engine use limitations of conditions **AQ-28** and **AQ-30** in the Annual Compliance Report, including a photograph showing the annual reading of engine hours. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-35 This unit shall not be used to provide power to the interconnecting utility and shall be isolated from the interconnecting utility when operating.

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

AQ-36 This engine may operate in response to notification of impending loss of utility back-feed power if the interconnected utility has ordered an outage to the plant or expects to order such outages at a particular time, the engine is operated no more than 30 minutes prior to the forecasted outage, and the engine is shut down immediately after the utility advises that the outage is no longer imminent or in effect.

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

AQ-37 No two permitted stationary emergency engines (emergency generators or emergency fire pump engines) shall be readiness tested on the same calendar day.

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

AQ-38 This engine shall exhaust through a stack at a minimum height of 60 feet.

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

AQ-39 This unit is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (Title 17 CCR 93115). In the event of conflict between these conditions and the ATCM, the more stringent shall govern.

Verification: Not necessary.

AQ-40 This unit is subject to the requirements of the Federal National Source Performance Standards (NSPS) for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60 Subpart IIII).

Verification: The project owner shall submit the engine specifications at least 30 days prior to purchasing the engines for review and approval demonstrating that the engines meet NSPS and ARB ATCM emission limit requirements at the time of engine purchase.

APPLICATION NO. 00010714 AND 00010715 (TWO - 346 HP EMERGENCY IC ENGINE)

EQUIPMENT DESCRIPTION

Two - 346 HP diesel fueled emergency generator engines, each driving a fire suppression water pump.

AQ-41 This equipment shall be installed, operated and maintained in strict accord with those recommendations of the manufacturer/supplier and/or sound engineering principles which produce the minimum emissions of contaminants. Unless otherwise noted, this equipment shall also be operated in accordance with all data and specifications submitted with the application for this permit.

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

AQ-42 This unit shall only be fired on ultra-low sulfur diesel fuel, whose sulfur concentration is less than or equal to 0.0015% (15 ppm) on a weight per weight basis per CARB Diesel or equivalent requirements.

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

AQ-43 A non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed and maintained on this unit to indicate elapsed engine operating time. (Title 17 CCR §93115.10(e)(1)).

Verification: At least thirty (30) days prior to the installation of the engine, the project owner shall provide the District and the CPM the specification of the hour timer.

AQ-44 This unit shall be limited to use for emergency fire suppression, defined as in response to a fire or due to low fire water pressure. In addition, this unit shall be operated no more than 50 hours per year for testing and maintenance, excluding compliance source testing. Time required for source testing will not be counted toward the 50 hour per year limit. The 50 hour limit can be exceeded when the emergency fire pump assembly is driven directly by a stationary diesel fueled CI engine operated per and in accord with the National Fire Protection Association (NFPA) 25 - "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems," 1998 edition. This requirement includes usage during emergencies. {Title 17 CCR 93115.3(n)}

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

AQ-45 The project owner shall maintain a operations log for this unit current and on-site, either at the engine location or at a on-site location, for a minimum of two (2) years, and for another year where it can be made available to the District staff within five (5) working days from the District's request, and this log shall be provided to District, State and Federal personnel upon request. The log shall include, at a minimum, the information specified below:

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

b. Reason for use (testing & maintenance, emergency, required emission testing);

c. Calendar year operation in terms of fuel consumption (in gallons) and total hours; and,

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

Verification: The project owner shall submit records required by this condition that demonstrating compliance with the sulfur content and engine use limitations of conditions **AQ-42, AQ-44, and AQ-46** in the Annual Compliance Report, including a photograph showing the annual reading of engine hours. The project

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

AQ-46 No two permitted stationary emergency engines (emergency generators or emergency fire pump engines) shall be readiness tested on the same calendar day.

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

AQ-47 This engine shall exhaust through a stack at a minimum height of 60 feet.

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

AQ-48 This unit is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (Title 17 CCR 93115). In the event of conflict between these conditions and the ATCM, the requirements of the ATCM shall govern.

Verification: Not necessary.

AQ-49 This unit is subject to the requirements of the Federal National Source Performance Standards (NSPS) for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60 Subpart IIII).

Verification: The project owner shall submit the engine specifications at least 30 days prior to purchasing the engines for review and approval demonstrating that the engines meet NSPS and ARB ATCM emission limit requirements at the time of engine purchase.

APPLICATION NO. 00010995 (ONE – GASOLINE STORAGE TANK)

EQUIPMENT DESCRIPTION

One – Above ground gasoline storage tank and fuel receiving and dispensing equipment.

AQ-50 The toll-free telephone number that must be posted is 1-800-635-4617 or 1-877-723-8070.

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

AQ-51 The project owner shall maintain a log of all inspections, repairs, and maintenance on equipment subject to Rule 461. Such logs or records shall be maintained at the facility for at least two (2) years and available to the District upon request. Records of Maintenance, Tests, Inspections, and Test Failures shall be maintained and available to

District personal upon request; record form shall be similar to the Maintenance Record form indicated in EO VR-401-A, Figure 2N.

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

AQ-52 Any modifications or changes to the piping or control fitting of the vapor recovery system requires prior approval from the District.

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

AQ-53 Pursuant to EO VR-401-A, vapor vent pipes are to be equipped with Husky 5885 pressure relief valves or as otherwise allowed by EO.

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

AQ-54 The project owner shall perform the following tests within 60 days of construction completion and annually thereafter in accord with the following test procedures:

a. Determination of Static Pressure Performance of Vapor Recovery Systems at Gasoline Dispensing Facilities with Aboveground Storage Tanks shall be conducted per EO VR-401-A Exhibit 4. and,

b. Phase I Adapters, Emergency Vents, Spill Container Drain Valve, Dedicated gauging port with drop tube and tank components, all connections, and fittings shall NOT have any detectable leaks; test methods shall be per EO VR-401-A Table 2-1, and

c. Liquid Removal Test (if applicable) per TP-201.6, and

Summary of Test Data shall be documented on a Form similar to EO VR-401-A Form 1.

The District shall be notified a minimum of 10 days prior to performing the required tests with the final results submitted to the District within 30 days of completion of the tests.

The District shall receive passing test reports no later than six (6) weeks prior to the expiration date of this permit.

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

AQ-55 Pursuant to California Health and Safety Code sections 39600, 39601 and 41954, this aboveground tank shall be installed and maintained in accordance with Executive Order (EO) VR-401-A for EVR Phase I, and Standing Loss requirements: http://www.arb.ca.gov/vapor/eos/eo-vr401/eo-vr401a/eo-401a.pdf.

Additionally, Phase II Vapor Recovery System shall be installed and maintained per G-70-116-F with the exception that hanging hardware shall be EVR Balance Phase II type hanging hardware (VST or other CARB Approved EVR Phase II Hardware).

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

AQ-56 Pursuant to EO VR-401-A: Maintenance and repair of system components, including removal and installation of such components in the course of any required tests, shall be performed by OPW Certified Technicians.

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

AQ-57 Pursuant to EO VR-401-A, Maintenance Intervals for OPW; Tank Gauge Components; Dust Caps Emergency Vents; Phase I Product and Vapor Adapters, and Spill Container Drain Valve, shall be conducted by an OPW trained technician annually.

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

AQ-58 The annual throughput of gasoline shall not exceed 600,000 gallons per year. Throughput Records shall be kept on site and available to District personnel upon request. Before this annual throughput can be increased the facility may be required to submit to the District a site specific Health Risk Assessment in accord with a District approved plan. In addition public notice and/or comment period may be required.

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

AQ-59 The project owner shall install, maintain, and operate EVR Phase I in compliance with CARB Executive Order VR-401-A, and Phase II vapor recovery in accordance with G-70-116-F. In the event of conflict between these permit conditions and/or the referenced EO's the more stringent requirements shall govern.

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

C. PUBLIC HEALTH

The public health analysis supplements the previous discussion on air quality and considers the potential public health effects from project emissions of toxic air contaminants. In this analysis, we review the evidence concerning whether such emissions will result in significant adverse public health impacts that violate standards for public health protection.[23] The evidence was undisputed. (6/28/10 RT 64-76, 81, Exs. 1, §5.10, Appendix C; 2 [Appendix B (g)(9)(D)]; 3 [Items 83-88], 11 [Items 83- 88], 13 [Items 83, 85, 86], 19 [Item 83], 39, 48 [§§ 8.0, 9.0], 301 § 5.7.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

Project construction and operation will result in routine emissions of toxic air contaminants (TACs). These substances are categorized as noncriteria pollutants because there are no ambient air quality standards established to regulate their emissions.[24] In the absence of standards, state and federal regulatory programs have developed a health risk assessment procedure to evaluate potential health effects from these emissions.

1. Health Risk Assessment

The risk assessment consists of the following steps:

- Identify the types and amounts of hazardous substances that AMS could emit to the environment;
- Estimate worst-case concentrations of project emissions in the environment using dispersion modeling;

---

[23] This Decision discusses other potential public health concerns in the following sections. The accidental release of hazardous materials is discussed in **Hazardous Materials Management** and **Worker Safety and Fire Protection**. Electromagnetic fields are discussed in the section on **Transmission Line Safety and Nuisance**. Potential impacts to soils and surface water sources are discussed in the **Soil and Water Resources** section of this Decision. Hazardous and non-hazardous wastes are described in **Waste Management**.

[24] Criteria pollutants are discussed in the **Air Quality** section.

- Estimate amounts of pollutants to which people could be exposed through inhalation, ingestion, and dermal contact;[25] and
- Characterize potential health risks by comparing worst-case exposure to safe standards based on known health effects. (Ex. 301, p. 5.7-6.)

Typically, the initial risk analysis for a project is performed at a "screening level," which is designed to conservatively estimate actual health risks. The risks for screening purposes are based on examining conditions that would lead to the highest, or worst-case, risks and then using those conditions in the study. Such conditions include:

- Using the highest levels of pollutants that could be emitted from the plant;
- Assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
- Using the type of air quality computer model which predicts the greatest plausible impacts;
- Calculating health risks at the location where the pollutant concentrations are estimated to be the highest;
- Assuming that an individual's exposure to cancer-causing agents occurs continuously for 70 years; and
- Using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses). (Ex. 301, pp. 5.7-6 - 5.7-7.)

The risk assessment process addresses three categories of health impacts: acute (short-term) health effects; chronic (long-term) non-cancer effects; and cancer risk (also long-term). Acute health effects result from short-term (one-hour) exposure to relatively high concentrations of pollutants. Chronic health effects are those which arise as a result of long-term exposure to lower concentrations of pollutants. The exposure period is considered to be approximately from 12 to 100 percent of a lifetime, or from eight to 70 years. (Ex. 301, p. 5.7-7.)

---

[25] Exposure pathways, or ways in which people might come into contact with toxic substances, include inhalation, dermal (through the skin) absorption, soil ingestion, consumption of locally grown plant foods, and mother's milk.

The analysis for non-cancer health effects compares the maximum project contaminant levels to safe levels called “reference exposure levels” or RELs. These are amounts of toxic substances to which even sensitive people can be exposed and suffer no adverse health effects. These exposure levels are designed to protect the most sensitive individuals in the population such as infants, the aged, and people suffering from illness or disease which make them more sensitive to the effects of toxic substance exposure. The RELs are based on the most sensitive adverse health effects reported, and include margins of safety. (*Id.*)

For carcinogenic substances, the health assessment considers the risk of developing cancer and assumes that continuous exposure to the cancer-causing substance occurs over a 70-year lifetime. The risk that is calculated is not meant to project the actual expected incidence of cancer, but rather a theoretical upper-bound number based on worst-case assumptions.

Cancer risk is expressed in chances per million, and is a function of the maximum expected pollutant concentration, the probability that a particular pollutant will cause cancer, and the length of the exposure period. Cancer risks for each carcinogen are added to yield total cancer risk. The conservative nature of the screening assumptions used means that actual cancer risks due to project emissions are likely to be considerably lower than those estimated.

If the screening analysis predicts no significant risks, then no further analysis is required. However, if risks are above the significance level, then further analysis, using more realistic, site-specific assumptions is performed to obtain a more accurate assessment of potential public health risks. (Ex. 301, pp. 5.7-7 - 5.7-8.)

2. Significance Criteria

For non-cancer health effects, total hazard index[26] of less than one indicates that cumulative worst-case exposures are less than, or below, the safe levels. (Ex. 301, p. 5.7-8.)

---

[26] The hazard index for every toxic substance which has the same type of health effect is added to yield a total hazard index. The total hazard index is calculated separately for acute and chronic effects.

Cancer risks are calculated based on the total risk from exposure to all cancer causing chemicals. A significant increased lifetime cancer risk occurs if one excess case of cancer in an exposed population of 100,000 (equivalent to a risk of 10 in one million or 10×10^{-6}) is calculated to occur. (Ex. 301, p. 5.7-9.)

Toxic emissions will be attributable to the project during both its construction and its operation phases. The Applicant and Staff each performed an analysis of the impacts of the AMS, which evaluated potential cancer and non-cancer health risks to the public. (Ex. 1, pp. 5.10-1 -5.10-19; 301, pp. 5.7-1 to 5.7-24.) Staff also used a modeling tool developed by the California Air Resources Board (CARB) - the Hot Spots Analysis and Reporting Program (HARP) – which uses dispersion modeling to examine local cumulative toxic impacts and the extent of the AMS's contribution to these impacts. (Ex. 301, p. 5.7-15.)

3. Construction Impacts

Construction impacts are short-term in nature (approximately 26 months). As noted earlier, assessment of chronic (long-term) health effects assumes continuous exposure to toxic substances over a significantly longer time period, typically from eight to 70 years. (Ex. 301, p. 5.7-10.)

The Applicant conducted a health risk assessment for diesel particulate matter (DPM) from construction equipment emissions. The Applicant's modeling of worst-case construction emissions adjusted to a 26-month period (lifetime exposure adjustment factor of 0.031) found that the cancer risk was estimated to be 1.33 in one million at the maximum impact receptor (MIR), below the level of significance (10 in one million). The chronic hazard index was found to be 0.029 at the MIR, below the level of significance of 1.0. (Exs. 13, 301, p. 5.7-14)

The recommended control measures contained in the **Air Quality** section of this Decision will reduce the maximum calculated PM10 as well as PM2.5 concentrations. These include extensive fugitive dust control measures that are assumed to result in 90 percent reduction of fugitive dust emissions. In order to mitigate potential impacts from particulate emissions during the operation of diesel-powered construction equipment, the evidence indicates that the use of ultra low-sulfur diesel fuel and Tier 2 or Tier 1 California Emission Standards for Off-Road Compression-Ignition Engines or the installation of an oxidation catalyst and soot filters on diesel equipment is recommended. The catalyzed diesel particulate filters are passive, self-regenerating filters that reduce particulate matter, carbon monoxide, and hydrocarbon emissions through catalytic oxidation and filtration. The degree of particulate matter reduction is comparable for both

mitigation measures in the range of approximately 85 to 92 percent. Such filters will reduce diesel emissions during construction and further reduce the impacts associated with diesel exhaust. (Ex. 301, pp., 5.7-10 to 5.7-11.) (See the **Air Quality** section of this Decision for conditions to control particulate matter.)

4. Operational Impacts

During operation, the emission sources at AMS include two auxiliary boilers, two diesel-fueled emergency generators, two diesel-fueled emergency fire pumps, two cooling towers, HTF fugitives, and DPM from maintenance vehicles. The evidence explains, in depth, the methodology used in identifying and quantifying the emission rates of the toxic non-criteria pollutants that could adversely affect public health. Basically, once potential emissions are identified, they are then quantified by conducting a "worst case" analysis. Maximum hourly emissions are used to calculate acute (one-hour) non-cancer health effects, while estimates of maximum emissions on an annual basis are used to calculate cancer and chronic (long-term) non-cancer health effects. (Ex. 301, pp. 5.7-11 - 5.7-13.)

Ambient concentrations of toxic substances are then estimated by using a screening air dispersion model and assuming conditions that result in maximum impacts. Finally, ambient concentrations were used in conjunction with RELs and cancer unit risk factors to estimate health effects which might occur from exposure to facility emissions. (*Id.*)

As **Public Health Table 1** shows, both acute and chronic hazard indices are under the REL of 1.0, and cancer risk is below the level of significance of 10 in 1,000,000, indicating that no short- or long-term adverse health effects are expected.

Public Health Table 1
Operation Hazard/Risk at Point of Maximum Impact

Type of Hazard/Risk	Hazard Index/Risk	Significance Level	Significant?
Acute Noncancer	0.0087	1.0	No
Chronic Noncancer	0.00992	1.0	No
Individual Cancer	6.85 in one million	10 in one million	No

(Ex. 301, Public Health Table 3, p. 5.7-14)

Staff reviewed the Applicant's modeling and also conducted an independent risk assessment for the AMS project using the CARB's HARP modeling tool. Cancer

risk and chronic and acute hazard index values obtained by Staff are compared to results reported by the Applicant in **Public Health Table 2**. Risk and hazard were determined at the point of maximum impact, PMI, under the 70-year residential scenario, located east of the project. Six to eight residences were reported to be located to the southwest of the project site and 10 sensitive receptors within a two-mile radius; however, these specific locations were not modeled by the Applicant. (Ex. 301, pp. 5.7-15 – 5.7-18.)

Public Health Table 2
Results of Staff's Analysis and the Applicant's Analysis for Cancer Risk and Chronic and Acute Hazard

	Staff's Analysis			**Applicant's Analysis**		
	Cancer Risk (per million)	**Chronic HI**	**Acute HI**	**Cancer Risk (per million)**	**Chronic HI**	**Acute HI**
PMI (for cancer risk and chronic HI, Rec. #302)	6.9	0.017	0.0087	6.9	0.0099	0.0087
PMI (acute HI, Rec. #130)	6.3	0.0068	0.026	6.3	0.0045	0.026

Note: PMI = point of maximum impact
(Ex. 301, Table 6, p. 5.7-17.)

This independent modeling shows that all cancer risks due to emissions from AMS are less than 10 in 1,000,000 and that all chronic and acute non-cancer hazard indices are less than 1.0. These results indicate a lack of non-cancer hazard from facility emissions at all receptors evaluated. (Ex. 301, p. 5.7-17.)

In conclusion, Staff's analysis, while differing slightly from the Applicant's, nevertheless confirms that AMS emissions will not present significant cancer risk or non-cancer hazards to any member of the public.

Finally, the evidence shows that in addition to being a source of potential toxic air contaminants, the possibility exists for bacterial growth, including Legionella, to occur in the two wet cooling towers (one on each power block). It is the principal cause of legionellosis, otherwise known as Legionnaires' Disease, which is similar to pneumonia. Transmission to people results mainly from inhalation or aspiration of aerosolized contaminated water. Untreated or inadequately treated cooling systems, such as industrial cooling towers and building heating,

ventilating, and air conditioning systems, have been correlated with outbreaks of legionellosis. (Exs. 1, pp. 5.10-11- 5.10-12, 301, p. 5.7-18.)

According to the evidence, good preventive maintenance is very important in the efficient operation of cooling towers and other evaporative equipment. Preventive maintenance includes having effective drift eliminators periodically cleaning the system if appropriate, maintaining mechanical components in working order, and maintaining an effective water treatment program with appropriate biocide concentrations. (Ex. 301, pp. 5.7-19 - 5.7-20.)

In order to ensure that Legionella growth is kept to a minimum, Condition of Certification **PUBLIC HEALTH-1** is necessary. This condition requires the project owner to prepare and implement a biocide and anti-biofilm agent monitoring program to ensure that proper levels of biocide and other agents are maintained within the cooling tower water at all times, that periodic measurements of Legionella levels are conducted, and that periodic cleaning is conducted to remove bio-film buildup.

5. Cumulative Impacts

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of current projects, and the effects of probable future projects. [Cal. Code Regs., tit. 14, § 15130.]

For the purpose of the public health cumulative analysis, emissions from construction or operation of the AMS could potentially combine with emissions from past, present and reasonably foreseeable projects to result in adverse health effects to the public. Cumulative impacts in the area of public health could occur if emission sources are close enough so that their plumes combine. Due to differences in emission source elevations, terrain features, wind direction, and other meteorological factors, it is unlikely that emission plumes from two or more facilities would combine unless they are located in very close proximity. Furthermore, dispersion of plumes tends to occur in parallel, preventing the mixing of plumes from separate locations. On the basis of numerous previous air dispersion modeling conducted by staff to assess public health cumulative impacts, the evidence shows that the geographic area considered for cumulative impacts on public health is only within the project boundaries or within ½ mile of the project. (Ex. 301, p. 5.7-20.)

The only nearby existing projects are the SEGS VIII and IX, solar power plants with a combined generation capacity of 160 MW, located immediately northwest of the proposed AMS site. These sources are located close enough to the proposed AMS site for public health cumulative impacts to be feasible. However, due to the low emissions of toxic air contaminants (TACs) modeled for this project and the resulting minimal health risks, the potential for significant cumulative impacts is extremely low. Furthermore, solar projects such as the proposed AMS and the SEGS VIII and IX units have minimal public health impacts that even when combined represent an insignificant risk to the public. (Ex. 301, p. 5.7-20.)

Nearby future projects that may contribute to a public health cumulative impact include only one solar photovoltaic project that is planned to be located about one mile northeast of the proposed AMS. The evidence shows that at this distance there is no potential for significant cumulative impacts to occur during construction or operation of the AMS and the solar photovoltaic project. (Ex. 301, pp. 5.7-20 - 5.7-21.)

The evidence shows that there will be no significant change in lifetime risk to any person, and the increase does not represent any real contribution to the average lifetime cancer incidence rate due to all causes (environmental as well as lifestyle and genetic). Therefore, the evidence shows that the incremental impact of the additional risk posed by the AMS project will not be individually or cumulatively significant. (Ex. 301, p. 5.7-21.)

FINDINGS OF FACT

Based on the evidence, the Commission makes the following findings and conclusions:

1. Construction and normal operation of the project will result in the routine release of criteria and noncriteria pollutants that have the potential to adversely impact public health.

2. Potential construction-related adverse health effects from diesel emissions and fugitive dust will be mitigated to insignificant levels.

3. Emissions of criteria pollutants, which are discussed in the **Air Quality** section of this Decision, will be mitigated to levels consistent with applicable standards.

4. The Applicant performed a health risk assessment, using well-established scientific protocol, to analyze potential adverse health effects of toxic air contaminants.

5. The accepted method used by state regulatory agencies in assessing the significance for both acute and chronic noncarcinogenic public health effects is known as the hazard index method. A similar method is used for assessing the significance of potential carcinogenic effects.

6. Application of the hazard index method establishes that emission of non-criteria pollutants from the AMS will not cause acute or chronic adverse public health effects.

7. The maximum non-cancer and the maximum cancer risks associated with the project are substantially below the significance thresholds commonly accepted for risk analysis purposes, even when considering the impacts of SEGS VIII and IX.

8. The project owner will implement a Cooling Water Management Plan in accordance with applicable LORS and guidelines to minimize the potential for growth of Legionella bacteria and other micro-organisms in cooling tower emissions.

9. Cumulative impacts from noncriteria pollutants were analyzed in accordance with the provisions of CEQA. Impacts from the AMS's emissions of these pollutants are not expected to be significant.

CONCLUSIONS OF LAW

1. We therefore conclude that project emissions of noncriteria pollutants do not pose a significant direct, indirect, or cumulative adverse public health risk and that the AMS project will comply with the applicable laws, ordinances, regulations, and standards specified in the appropriate portion of **Appendix A** of this Decision.

CONDITION OF CERTIFICATION

Public Health-1 The project owner shall develop and implement a Cooling Water Management Plan to ensure that the potential for bacterial growth in cooling water is kept to a minimum. The Plan shall be consistent with either Staff's "Cooling Water Management Program Guidelines" or with the Cooling Technology Institute's "Best Practices for Control of Legionella" guidelines but, in either case, the Plan must

include sampling and testing for the presence of Legionella bacteria at least every six months. After two years of power plant operations, the project owner may ask the Compliance Project Manager (CPM) to re-evaluate and revise the Legionella bacteria testing requirement.

Verification: At least 60 days prior to the commencement of cooling tower operations, the Cooling Water Management Plan shall be provided to the CPM for review and approval.

D. WORKER SAFETY AND FIRE PROTECTION

Workers at industrial facilities are commonly exposed to potential health and safety hazards on a daily basis. Implementation of various existing laws and standards suffices to reduce these hazards to minimal levels. (Ex. 301, p. 5.14-4.) Therefore, this section of the Decision focuses on whether Applicant's proposed health and safety plans are in accordance with all applicable LORS and thus adequate to protect industrial workers. The record also addresses the availability and adequacy of fire protection and emergency response services. With one exception, the evidence on this topic was uncontested. (6/28/2010 64-76, 81, 7/15/10 RT 33-130, 147-246, Exs. 1 ,§ 5-14, 3, 26, 48, 52, 53, 301, 306, 313, 315-334.)

As more fully discussed below, the parties disagreed regarding whether the (1) the project will cause direct, indirect, or cumulative impacts on fire protection and emergency services; (2) and if so, the appropriate level of mitigation to reduce the impacts to a less than significant level.

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Worker Safety

Industrial environments are potentially dangerous during construction, operation, and demolition activities. Workers at the Abengoa Mojave Solar (AMS) Project will be exposed to loud noises, moving equipment, trenches, and confined space entry and egress problems. They may experience falls, trips, burns, lacerations, and various other injuries. They may be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, electrical sparks, and electrocution. (Ex. 301, p. 5.14-5.)

This power plant comprises a work environment which includes natural gas-fired boilers and solar thermal generation equipment. At the power block, workers will be exposed to hazards typical for construction and operation of a simple cycle gas-fired facility; the solar component will present similar construction risks, but minimal operational risks.

The area under the solar arrays must be kept free from weeds by applying herbicides as necessary. Inhalation and ingestion of dusts containing herbicides can pose a health risk. Cleaning, servicing, and inspecting the mirrors will be conducted on a routine schedule. These activities will take place year-round,

especially during the summer months of peak solar power generation when outside ambient temperatures routinely reach 115º Fahrenheit and above. (Ex. 301, p. 5.14-9.) Thus, it is important that the project have well-defined policies and procedures, training, hazard recognition, and controls to minimize injuries and protect workers.

The evidence extensively details the type and content of various plans which must be developed to ensure the protection of worker health and safety, as well as compliance with applicable LORS. (Ex. 301, pp. 5.14-4 to 5.14-10.) For example, the project owner will develop and implement a "Construction Safety and Health Program" and an "Operations and Maintenance Safety and Health Program," both of which must be reviewed by the Compliance Project Manager prior to project construction and operation. A separate "Injury and Illness Prevention Program," a "Personal Protective Equipment Program," an "Emergency Action Plan," a "Fire Prevention Plan," and other general safety procedures will be prepared for both the construction and operation phases of the project. (*Id*.) Conditions of Certification **WORKER SAFETY-1** and **-2** ensure that these measures will be developed and implemented. Condition **WORKER SAFETY-2** also requires the development and implementation of Best Management Practices (BMPs) for the storage and application of herbicides used to control weeds beneath and around the solar array. (Ex. 301, pp. 5.14-5 - 5.14-9.)

Both safety and health programs noted above would be comprised of six more specific programs and would require major items including:

- Injury and Illness Prevention Program
- Fire Prevention Plan
- Personal Protective Equipment Program
- Emergency Action Plan
- Written Safety Program
- Safety Training Programs (Ex. 301, pp. 5.14-7 - 5.14-9.)

OSHA and Cal-OSHA standards encourage employers to monitor worker safety by employing a "competent person" who has knowledge and experience enforcing workplace safety standards, can identify hazards relating to specific project operations, and has authority to take appropriate action. To implement the intent to provide a safe workplace during power plant construction, Condition **WORKER SAFETY-3** requires the project owner to designate a power plant Construction Safety Supervisor. This individual will coordinate and implement

the Construction and Operation Safety and Health Programs, as well as investigate any safety-related incidents and emergency responses. (Ex. 301, pp. 5.14-10 – 5.14-11.)

The evidence includes a summary review by Staff of accidents, fires, and a worker death that occurred at Energy Commission-certified power plants in the recent past. Staff asserts these events were due to the failure to recognize and control safety hazards and the inability to adequately supervise compliance with occupational safety and health regulations. (Ex. 301, p. 5.14-11.) The Staff summary supplements Applicant's Hazard Analysis of construction-related risks to workers and the steps to control such risks. (Ex. 1, p. 5.18-13 - 5.18-16.)

To reduce and/or eliminate safety hazards during project construction and operation, it is necessary to employ a professional Safety Monitor. The Safety Monitor, who is hired by the project owner but reports to the Chief Building Official and the Compliance Project Manager (CPM), will track compliance with OSHA/Cal-OSHA regulations and serve as an on-site OSHA expert. This professional will periodically audit safety compliance during construction, commissioning, and the transition to operational status as well as ensure that safety procedures and practices are fully implemented. (Id.) Condition **WORKER SAFETY-4** describes the role of the Safety Monitor.

The project owner will maintain an automatic portable defibrillator on-site to provide immediate response in the event of medical emergency.[27] Condition **WORKER SAFETY-5** requires the project owner to ensure this device is available during construction and operation, and that appropriate personnel are trained to use it. (Ex. 301, p. 5.14-19.)

The evidence of record also contains a Staff analysis of risks to workers associate with Valley Fever. Coccidioidomycosis or "Valley Fever" (VF) is caused by inhaling the spores of the fungus Coccidioides immitis, which are released from the soil during soil disturbance (e.g., during construction activities) or wind erosion. The disease usually affects the lungs and can have potentially severe consequences, especially in at-risk individuals. Trenching, excavation, and construction workers are often the most exposed population. Treatment

[27] Staff's testimony indicates that the potential for both work-related and non work-related heart attacks exists at power plants. The quickest medical intervention can be achieved with the use of an on-site defibrillator. Many modern industrial and commercial enterprises maintain defibrillators for emergency use. We find this to be an appropriate safety and health precaution. (Ex. 301, p. 5.14-19.)

usually includes rest and antifungal medications. No effective vaccine currently exists for Valley Fever. (Ex. 301, pp. 5.14-12 to 5.14-18.) To minimize potential exposure of workers and also the public to coccidioidomycosis during soil excavation and grading, extensive wetting of the soil prior to and during construction activities should be employed and dust masks should be worn at certain times during these activities. Condition of Certification **WORKER SAFETY-7** requires that the dust control measures found in proposed Conditions **AQ-SC3** and **AQ-SC4** be supplemented with additional requirements. (*Id*.)

2. Fire Protection and Emergency Response

Project construction and operation pose the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, hydraulic fluid, mineral oil, insulating fluid or flammable liquids, explosions, and over-heated equipment may cause small fires.

The project will rely upon both on-site and local fire protection services. The on-site fire protection system provides the first line of defense for such occurrences. The Construction Fire Prevention Plan (Condition **WORKER SAFETY-1**) must address and detail measures to minimize the likelihood of fires during construction. These measures include the placement of portable fire extinguishers, safety procedures, and training. (Ex. 301, pp. 5.14-18 to 5.14-19.)

Local fire support services are under the San Bernardino County Fire Department's (SBCFD) jurisdiction. There are a total of twenty fire stations within the SBCFD North Desert Division, the closest of which would be Hinkley Station #125, located approximately 14 miles from the AMS site. This station is staffed with paid on-call firefighters, so their response time can range from 15 minutes to no response if they are unavailable. The availability of alternative fire and emergency response teams is shown in the table below.

Worker Safety and Fire Protection Table 1
Fire and Emergency Response for the AMS Project*

SBCFD Station	Total Response Time**	Distance to AMS	EMS/HazMat Capability***
Hinkley Station #125	15 min or no response	~14 miles	Y/Y
Silver Lakes/Helendale Station #4	20-30 min	~33 miles	Y/Y
Harvard Station #46	30-50 min	~50 miles	Y/Y

(Source: Ex. 301, p. 5.14-3.)

**Total response times are estimated from the moment a 911 call is made to arrival at the site and are dependent upon traffic conditions and other variables.

***All personnel are trained to EMT-1 level and first responder for hazardous materials incidents, and about 95% of personnel are trained paramedics.

During operation, the project will meet the fire protection and suppression requirements of the California Fire Code, all applicable recommended National Fire Protection Association (NFPA) standards (including Standard 850 addressing fire protection at electric generating plants), and all Cal/OSHA requirements. Fire suppression elements will include both fixed and portable fire extinguishing systems. (Exs. 1, § 5.18.3.3;. 301, pp. 5.14-18 – 5.14-19.) The fire protection system will be designed to protect personnel and limit property loss and plant downtime in the event of a fire. In addition to the fixed fire protection system, smoke detectors, flame detectors, high temperature detectors, appropriate class of service portable extinguishers, and fire hydrants must be located throughout the facility at code-approved intervals. These systems are standard requirements of the NFPA and the Uniform Fire Code (UFC). (*Id.*)

Emergency access to the project would be provided via eight gated access roads equipped with either manual locks or key cards. These access roads would provide two entrance points into each of the four gated sections of the AMS site. (Ex. 301, 5.14-18.)

Conditions of Certification **WORKER SAFETY-1** and **-2** require the project owner, prior to construction and operation of the project, to provide the final Fire Prevention Program to the Compliance Project Manager and the local fire authorities. These entities will then confirm its adequacy.

3. Cumulative Impacts

A significant cumulative Worker Safety/Fire Protection impact is defined as the simultaneous need for a fire department to respond to multiple locations such that its resources and those of the mutual aid fire departments are over-whelmed and cannot effectively respond. (Ex. 301, pp. 5.14-20 – 5.14-21.)

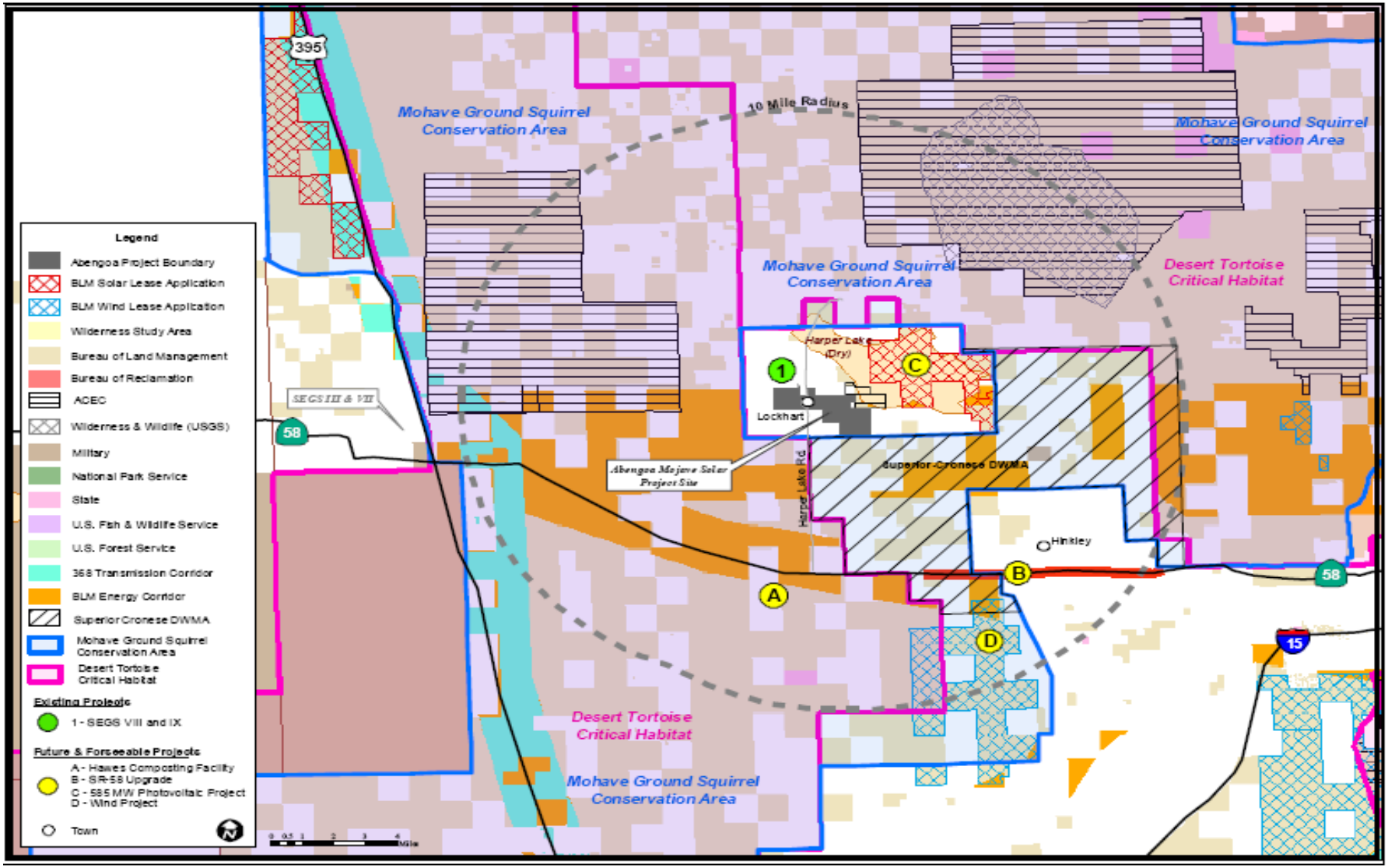
Currently, the SEGS VIII and IX facilities are the only existing developments in the nearby area. Reasonably foreseeable future projects, including proposed nearby solar and wind projects are shown below in **Worker Safety and Fire Table 2** and **Figure 1**. (Exs. 301, pp. 5.14-20 – 5.14-21.)

Table 2 - Harper Lake Region Future/Foreseeable Projects

ID	Project Name	Location	Agency/Owner	Status	Project Description	Source
A	Hawes Composting Facility	80 acres of a 160-acre parcel located south of State Route 58, approximately 12.3 miles east of Kramer Junction and eight miles west of Hinkley	Nursery Products, LLC	Under review by San Bernardino County Land Use Services Department. Hearing and publication of Final Supplemental Environmental Impact Report in November 2009.	Construct a biosolids and green material composting facility to produce agricultural grade compost. The facility would store on site a maximum of 7,000 cubic yards of green material feedstock and 2,000 cubic yards of biosolids The facility will process approximately 400,000 tons per year of compostable material. The total amount of active compost is not expected to exceed 250,000 tons.	San Bernardino County 2009
B	SR-58 via Hinkley	State Route 58 from 2.8 miles west of Hidden River Road (post mile 21.8) to 0.7 miles east of Lenwood Road (post mile 31.1)	Caltrans	Notice of intent in May 2007.	Upgrade and realign 10 miles of two-lane highway to 4-lane divided freeway/expressway.	Caltrans 2009
C	Solar Photovoltaic Project (BLM: CACA 48941)	(Desert Onyx) T11N, R3, & 4W	Optisolar, Inc.	BLM received application (April 2007), cost recovery funds, and POD. POD review pending.	585 MW solar photovoltaic project proposed for 5,033 acres of BLM land. Adjacent to Harper ACEC.	BLM 2009
D	Wind Project (BLM: CACA 46805)	(Iron Mountain) T8N, R3&4W South of Hwy 58.	Horizon Wind Energy	BLM received application (December 2004) and issued ROW grant (February 2006). ROW testing expires December 2009; request to amend within DWMA. BLM received cost recovery funds.	Wind project proposed on 10,105 acres of BLM land.	BLM 2009

CUMULATIVE IMPACTS - FIGURE 2

Abengoa Mojave Solar Project - Harper Lake Region Existing and Future / Foreseeable Projects



We find that the AMS project differs from the existing industrial, commercial and residential development in the San Bernardino County desert region and existing SEGS VIII and IX and Kramer Junction solar plants, given its design and proposed technology. (Exs. 306, 312.) The evidence further establishes that the AMS project may exacerbate existing fire station drawdown and, in the event of a major leak or fire, may cause adverse physical and nonphysical impacts to SBCFD's ability to provide timely and adequate fire protection and emergency services. (7/15/10 RT 115-116, Ex. 301, p. 5.14-21,306.)

Assistant SBCFD Fire Chief Brierty testified that there are drawdown issues in the county overall, but particularly in remote areas. Drawdown refers to the use of resources when one station provides back up to another station that is responding to a call. According to Asst. Chief Brierty, in traditional urban environments, it is common that when a fire station goes out on a call, another station will back it up. But, in remote areas, such as Hinkley, Kramer Junction, and Amboy, SBCFD does not have stations to back up other stations. This situation, taken together with the array of different types of facilities planned for development within the county -including the AMS project - may adversely affect SBCFD's ability to provide adequate response, adequate resources, and adequate firefighters, medics, EMTs, and paramedics. (7/15/10 RT 115 – 116, Ex. 301, p. 5.14-21.)

Thus, the incremental impact of the AMS project, together with the environmental changes anticipated from past, present, and probable future projects, is cumulatively considerable with respect to fire and emergency services. We are persuaded by Staff's evidence (developed in consultation with SBCFD) showing that these impacts can be fully mitigated to less than significant levels if the AMS project funds its proportionate share of SBCFD mitigation activities. At some future time, as indicated by the evidence, there may be need for SBCFD to construct additional fire infrastructure or improve existing fire stations, related fire equipment and staff, or related alternative mitigation measures. (Exs. 301, pp. 5.14-20 – 5.14-21, 306, 313.)

Staff specifically concludes that impacts attributable to the AMS project will be mitigated with the project's payment of $24.6 million dollars to SBCFD by way of an initial capital cost of $860,000 and annual payments of $793,000 for the life of the project. (Exs. 301, 306, 329.) In contrast, the Applicant maintains that any payment for impacts should not exceed $655,000 for the life of the project. (Ex. 52, Nickell Decl. and 7/12/2010 Memorandum.) While both parties provided documentary evidence and testimony to support their positions, neither party

provided clear evidence that the assumptions and methodologies underlying the respective funding recommendations adequately focused on the AMS project's reasonable and proportionate contribution to the identified cumulatively considerable impacts. (Exs. 52, Nickell Decl. and 7/12/2010 Memorandum, 306, 313, 329.)

Staff's methodologies and conclusions could require mitigation from the project in excess of its impacts, while the Applicant's methodology and conclusions could result in the project not providing its share of mitigation. For instance, as Asst. Chief Brierty testified with respect to the amount that the fire department needed to serve the collective projected solar projects, that AMS's share might go down as other projects contributed. Chief Brierty asserted the current proposal is modeled on "fair share" agreements applied to residential development in the county and based on overall projected population growth, not an evaluation of the risk associated with the AMS project or any particular project. (7/15/10 RT 147 -152.)

The Applicant's view of proportionality and cost allocation focuses on (1) the anticipated project-induces population and employment growth in the county and (2) the evidence submitted by Staff establishing that the combined incident rate for the SEGS VIII, IX, and Kramer Junction solar facilities was 30 over a period of 12 years, which was merely 2.5 emergency calls per year or 0.83 emergencies per solar plant per year. (7/15/10 RT 173-182, Exs. 52, 53 - Nickell Decl. and 7/12/2010 Memorandum, 306.) This evidence suggests that the analysis proposed by Staff and SBCFD for the AMS project's cost allocation did not properly consider the historical risks posed by solar facilities in San Bernardino County.

We find that further study is required to more precisely quantify the project's impacts and align the corresponding funding with the identified mitigation activities to be undertaken by SBCFD. As a result, we have adopted Condition of Certification **WORKER SAFETY-6**, which requires the project owner and SBCFD to agree upon a funding amount and payment terms to ensure adequate fire protection and emergency response as discussed above. Further, based on our determination that payment is adequate and necessary for implementation of the identified mitigation measures, we have also adopted **WORKER SAFETY-7**, which requires the project owner to deposit $200,000 with SBCFD toward the mitigation funding to enable SBCFD to begin implementation of the mitigation measures. By imposing this initial funding requirement we are not adopting Staff's recommended cost allocation for AMS; rather, we are ensuring that AMS begins fulfilling its mitigation obligations before construction begins. This

payment will ultimately be credited against the funding amount ultimately established under **WORKER SAFETY-6.**

4. Public Comment

A member of the public voiced concerns regarding an explosion at the existing nearby solar plant and that the local residences were not notified or provided with any information about it. He asked how the new solar plant will notify the local residences in the event of an emergency (a siren, a house visit, a phone call, etc.) and whether there is an evacuation plan for the local residence is case of a fire or emergency releasing toxins into the air. He raised doubts as to the assurances given the Commission that the Hinkley Fire Department will respond and is capable of handling an emergency involving toxic hazardous materials at the AMS plant.

Staff responded to the comment in its Supplemental Staff Assessment – Part A issued May 10, 2010. The Staff response noted that, based on Conditions of Certification found under the **Hazardous Material Management** section of this Decision, the AMS project must prepare and implement an emergency response plan. The response noted that the SBCFD Hazmat unit is located in Adelanto, about 50 miles from the AMS project, with a response time estimated at 45 minutes. (Ex. 301, pp. 5.14-21 - 5.14-22.)

FINDINGS OF FACT

Based on the evidence, and assuming implementation of the Conditions of Certification below, the Commission makes the following findings:

1. Industrial workers are exposed to potential health and safety hazards on a daily basis.

2. To protect workers from job-related injuries and illnesses, the project owner will implement comprehensive Safety and Health Programs for both the construction and the operation phases of the project.

3. The project will employ an on-site professional Safety Monitor during construction and operation.

4. The AMS project will include on-site fire protection and suppression systems as the first line of defense in the event of a fire.

5. The San Bernardino County Fire Department (SBCFD) will provide fire protection and emergency response services to the project.

6. The project will not have a significant direct or indirect impact on fire protection and emergency service; however, it may result in significant cumulative impacts. Implementation of the Conditions of Certification below will reduce any potential project impacts to fire protection and emergency service to less than significant levels.

7. With implementation of the Conditions of Certification, below, the AMS project will comply with all applicable LORS.

CONCLUSION OF LAW

1. We therefore conclude that the AMS project will not create significant health and safety impacts to workers, and will comply with all applicable laws, ordinances, regulations, and standards listed in the appropriate portion of **Appendix A** of this Decision.

CONDITIONS OF CERTIFICATION

WORKER SAFETY-1 The project owner shall submit to the Compliance Project Manager (CPM) a copy of the Project Construction Safety and Health Program containing the following:

- A Construction Personal Protective Equipment Program;
- A Construction Exposure Monitoring Program;
- A Construction Injury and Illness Prevention Program;
- A Construction heat stress protection plan that implements and expands on existing Cal OSHA regulations as found in 8 CCR 3395;
- A Construction Emergency Action Plan; and
- A Construction Fire Prevention Plan.

The Personal Protective Equipment Program, the Exposure Monitoring Program, the Heat Stress Protection Plan, and the Injury and Illness Prevention Program shall be submitted to the CPM for review and approval concerning compliance of the program with all applicable safety orders. The Construction Emergency Action Plan and the Fire Prevention Plan shall be submitted to the San Bernardino County Fire Department (SBCFD) for review and comment prior to submittal to the CPM for approval.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the SBCFD a copy of the Construction Fire Prevention Plan and Emergency Action Plan for review and comment and a copy of the Project Construction Safety and Health Program to the CPM for review and approval. .

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 SBCFD for review and comment.

Verification: At least 30 days prior to the start of commissioning, the project owner shall submit to the SBCFD the final Operations Fire Prevention Plan and Emergency Action for review and the final Project Operations and Maintenance Safety and Health Program to the CPM for approval.

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, although the plans themselves may be administered by someone different (i.e. Plant Safety Representative or Designee).

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.

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. 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.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM proof that a portable automatic external defibrillator (AED) exists on site and a copy of the training and maintenance program for review and approval.

WORKER SAFETY-6 The project owner shall either:

(1) Reach an agreement with the San Bernardino County Fire Department (SBCFD) regarding funding of its project-related share of capital and operating costs to improve fire protection/emergency response infrastructure and provide appropriate equipment as mitigation of project-related impacts on fire protection/emergency response services within the jurisdiction; ***or***

(2) If no agreement can be reached, the project owner shall fund a study (the "independent fire needs assessment and risk assessment") conducted by an independent contractor who shall be selected by the project owner and approved by the CEC Compliance Project Manager (CPM), in consultation with San Bernardino County Fire Department, and fulfill all mitigation identified in the independent fire needs assessment and a risk assessment. The study will evaluate the project's proportionate funding responsibility for the above-identified mitigation measures, with particular attention to emergency response and equipment/staffing/location needs.

Should the project owner pursue option (2), above, the study shall evaluate the following:

(a) The project's proportionate (incremental) contribution to potential cumulative impacts on the SBCFD and the project allocated costs of enhanced fire protection/emergency response services including the fire response, hazardous materials spill/leak response, rescue, and emergency medical services necessary to mitigate such impacts;

(b) The extent that the project's contribution to local tax revenue will reduce impacts on local fire protection and emergency response services; and

(c) Recommend an amount of funding (and corresponding payment plan) that represents the project's proportional payment obligation for the above-identified mitigation measures.

Compliance Protocols shall be as follows:

(a) The study shall be conducted by an independent consultant selected by the project owner and approved by the CPM. The project owner shall provide the CPM with the names of at least three consultants, whether entities or individuals, from which to make a selection, together with statements of qualifications;

(b) The study shall be fully funded by the project owner.

(c) The project owner shall provide the protocols for conducting the independent study for review and comment by the SBCFD and review and approval by the CPM prior to the independent consultant's commencement of the study;

(d) The consultant shall not communicate directly with the project owner or SBCFD without express prior authorization from the CPM. When such approval is given, the CPM shall be copied on any correspondence between or among the project owner, SBCFD, and the consultant (including emails) and included in any conversations between or among the project owner, SBCFD and consultant; and

(e) The CPM shall verify that the study is prepared consistent with the approved protocols, ***or***

(3) If the project owner and SBCFD do not agree to the recommendations of the independent consultant's study, the Energy Commission or its designee shall, based on the results of the study and comments from the project owner and SBCFD, make the final determination regarding the funding to be provided to the SBCFD to accomplish the above-identified mitigation.

No construction of permanent above-ground structures shall occur until funding of mitigation occurs pursuant to wither of the resolution options set forth above..

Verification: At least five (5) days before construction of permanent above-ground structures, the project owner shall provide to the CPM:

(1) A copy of the individual agreement with the SBCFD or, if the owner joins a power generation industry association, a copy of the group's bylaws and a copy of the group's agreement with the SBCFD; and evidence in each January Monthly Compliance Report that the project owner is in full compliance with the terms of such bylaws and/or agreement; ***or***
(2) A protocol, scope and schedule of work for the independent study and the qualifications of proposed contractor(s) for review and approval by the CPM; a copy of the completed study showing the precise amount the project owner shall pay for mitigation; and documentation that the amount has been paid.

Annually thereafter, the owner shall provide the CPM with verification of funding to the SBCFD if annual payments were approved or recommended under either of the above-described funding resolution options.

WORKER SAFETY -7 The project owner shall:

> Provide a $200,000 payment to San Bernardino County Fire Department prior to the start of construction. This funding shall off-set any initial funding required by **WORKER SAFETY-6** above until the funds are exhausted. This offset will be based on a full accounting by the San Bernardino County Fire Department regarding the use of these funds.

Verification: At least five (5) days prior to the start of construction the project owner shall provide documentation of the payment described above to the CPM. The CPM shall adjust the payments initially required by **WORKER SAFETY-6** based upon the accounting provided by the San Bernardino County Fire Department.

WORKER SAFETY-8 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; and

ii) 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.

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.

WORKER SAFETY-9 The project owner shall participate in joint training exercises with the SBCFD. The project owner shall coordinate this training with other Energy Commission-licensed solar power plants within San Bernardino County such that this project shall host the annual training on a rotating yearly basis with the other solar power plants.

Verification: At least 10 days prior to the start of commissioning, the project owner shall submit to the CPM proof that the joint training with the SBCFD is established and shall include the date, list of participants, training protocol, and location in the yearly compliance report to the CPM.

E. HAZARDOUS MATERIALS MANAGEMENT

This analysis considers whether the construction and operation of the AMS project will create significant impacts to public health and safety resulting from the use, handling, storage, or transport of hazardous materials. Several locational factors affect the potential for project-related hazardous materials to cause adverse impacts. These include local meteorological conditions, terrain characteristics, and the proximity of population centers and sensitive receptors. Solar power facilities are also subject to a number of laws, ordinances, regulations, and standards (LORS) related to hazardous materials. The evidence incorporates all of these factors in the analysis of potential impacts, as summarized below.[28] The evidence was undisputed. (6/28/10 RT 64-76, 81, Exs, 1, § 5.6,13, 20, 25, 26 [IV], 48 [§5.0], 301, § 5.4, 306.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

Engineering and administrative controls affect the significance of potential impacts related to the use, handling, storage and transport of hazardous materials. Engineering controls are those physical or mechanical systems (such as storage tanks or automatic shut-off valves), which can prevent a hazardous material spill from occurring, or which can limit the spill to a small amount and/or confine it to a small area. Administrative controls are those rules and procedures that workers at the facility must follow. Both types of controls are designed to help prevent accidents or keep them small if they do occur, and are specified at length in the evidence. (Ex. 301, pp. 5.4-8 to 5.4-10.) In both cases, the goal is to prevent a spill from moving off-site and causing harm. Timely and adequate emergency spill response is also a crucial factor. (Ex. 301, pp. 5.4-10, 5.4-17 to 5.4-20.)

Hazardous materials, such as mineral and lubricating oils, cleaning detergents, water conditioners, heat transfer fluid (HTF), and welding gases will be present at the facility during operation. Even though the AMS project will not use natural gas for energy production, natural gas will be supplied to the site (via a connection to an existing natural gas pipeline at the project site boundary) for the auxiliary boiler and domestic uses such as space heating. Operation of the AMS project will also require the transportation of hazardous materials to the facility. Hazardous materials used during the construction phase of the AMS project will include gasoline, diesel fuel, motor oil,

[28] The **Worker Safety** and **Fire Protection** portion of this Decision analyzes the protection of workers from such risks.

hydraulic fluid, welding gases, lubricants, solvents, paint, and paint thinner. No acutely toxic hazardous materials will be used on-site during construction. The hazardous materials expected for use during construction include gasoline, diesel fuel, oil, lubricants, welding gases, and small quantities of solvents and paints. (Exs. 1, pp. 5.6-11 – 5.6-24.)

A list of all hazardous materials proposed for use at the AMS facility is provided in **Hazardous Materials Management Appendix A**.

The evidence includes an assessment of the risks posed by the use of hazardous materials. This assessment included the following elements:

- Review of the types and amounts of chemicals proposed for on-site use, and a determination of the need and appropriateness of their use.
- Removal from further consideration of chemicals that will be used in small amounts, or whose physical state is such that there is virtually no chance that a spill will migrate off the site and impact the public.
- Review and evaluation of measures proposed to prevent spills. These included engineering controls such isolation valves (to allow isolation of individual pipe loops in the event of a leak) and different size transfer-hose couplings, as well as administrative controls such as worker training and safety management programs.
- Review and evaluation of measures proposed to respond to accidents. These measures also included engineering controls such as catchment basins and methods to keep vapors from spreading, as well as administrative controls such as training emergency response crews.
- Analysis of the theoretical impacts on the public of a worst-case spill of hazardous materials, even with the mitigation measures proposed. (Ex. 301, pp. 5.4-1, 5.4-5 - 5.4-8.)

1. Use and Storage of Small and Large Quantity Hazardous Materials

The evidence shows that except for natural gas, HTF, and petroleum, none of the hazardous materials used during construction and operation pose a significant potential for off-site impacts due to the small quantities involved and the substances' relative toxicity, physical state, and/or environmental mobility. (Ex., 301, pp. 5.4-6 - 5.4-7.) Requirements related to the types and amounts of hazardous materials approved for use in association with the AMS project (as identified in **Hazardous Materials Management Appendix A** are specified in Condition of Certification **HAZ-1**.

The project will involve the handling of large amounts of natural gas, with an accompanying risk of fire and explosion. The evidence shows that the project's compliance with applicable codes, which incorporate safety measures such as the use of double block and bleed valves for secure shut off, automated combustion controls, burner management, inspection of welds, and use of corrosion resistant coatings, will adequately minimize the potential for off-site impacts. (Ex. 301, p. 5.4-7.)

The HTF used at the AMS facility will be Therminol VP-1 or an equivalent such as Dowtherm A. Therminol is a synthetic oil comprised of diphenyl ether and biphenyl. (Dowtherm A consists of a similar mixture) and is solid at temperatures below approximately 54° F. It is therefore expected to remain liquid in the event of a spill. 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 2.3 million gallons of HTF will be contained in the AMS pipes and heat exchanger during project operation.

The properties of Therminol and the record of its previous use at other solar generating facilities have are disclosed in the record, along with data regarding leaks, spills, and fires involving this HTF. The evidence establishes that the placement of an adequate number of isolation valves in the HTF pipe loops throughout the solar array will add significantly to the safety and operational integrity of the entire system, by allowing an individual loop to be closed if a leak develops, rather than closing off the entire HTF system and shutting down the plant. (Ex. 301, pp. 5.4-7 to 5.4-8.) Condition of Certification **HAZ-4**, which requires the project owner to install a sufficient number of isolation valves that are automatically, manually, remotely and/or locally activated, will ensure that HTF leaks do not pose a significant risk.

The evidence further reveals that the Alpha solar field 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, several HTF pipes, all command and control systems, and the fire water loop will be required to cross Harper Lake Road or Lockhart Road. Implementation of Condition of Certification **HAZ-7** will ensure that all HTF pipes and associated facilities cross existing roads underground and include appropriate protective devices, and will ensure that roadway crossings by the noted facilities do not pose a significant risk. (Ex. 301, p. 5.4-8.)

Operation of the AMS facility will involve the on-site storage of 10,000 gallons or more of petroleum. Accordingly, the AMS will be required to prepare a Spill Prevention,

Control, and Countermeasure (SPCC) Plan, pursuant to California Health and Safety Code Sections 25270 through 25270.13. These regulations also require that spills or releases of 42 gallons or more be reported to the applicable regulatory bodies. (Ex. 301, pp. 5.4-3, 5.4-10.) These requirements are included in Condition of Certification **HAZ-2** and will ensure implementation of appropriate controls such as spill containment and prevention systems, personnel training, emergency response procedures, and spill notification. This measure will ensure that the proposed on-site use and storage of petroleum does not pose a significant risk.

Various containerized and bulk hazardous materials will be transported to the AMS site via truck. The evidence indicates that, based on considerations including environmental mobility, toxicity, quantity and frequency of deliveries, HTF poses the predominant risk associated with hazardous materials transport. Approximately 2.3 million gallons of HTF would be transported to the project site during the last nine months of construction. This would involve an estimated 374 deliveries during that period (about 10 trucks per week), with each delivery including approximately 6,130 gallons. The risk of an accidental release during HTF transport in the project area was assessed based on criteria such as previous accident data, established accident modeling, and existing regulatory requirements regarding transport of hazardous materials (e.g., standards for vehicle safety and driver qualifications/competence). The evidence shows that, with applicable regulatory conformance, the risk of exposure to significant concentrations of HTF during transportation to the AMS facility is extremely low. (Ex. 301, pp. 5.4-10 - 5.4-12.) Regulatory standards and related requirements associated with the transport, delivery, and security of hazardous materials to/within the AMS site are included in Conditions of Certification **HAZ-2**, **HAZ-3**, **HAZ-5**, **and HAZ-6**. Implementation of these measures will ensure that potential hazardous material exposure risks to the public related to transport and delivery operations will be less than significant.

Thus, we conclude that the AMS project's use and storage of hazardous materials will pose not significant impacts or risks as long as the project implements the mitigation measures proposed by the Applicant and Staff and the adopted Conditions of Certification. These Conditions reflect a Safety Management Program comprised of engineering and administrative controls. (Ex. 301, pp. 5.4-8 – 5.4-10.)

2. Transportation of hazardous Materials

Containerized and bulk hazardous materials will be transported to the facility by truck. The transport of HTF poses the greatest risk but, prior modeling by Staff of spills involving greater quantities of more toxic materials such as aqueous and anhydrous ammonia (neither or which will be used by, stored at, or transported to the AMS site)

demonstrates that minimal airborne concentrations would occur at short distances from the spill. (Ex. 301, p. 5.4-10.)

Nonetheless, liquid hazardous materials can be released during a transportation accident and the extent of the impact in the event of a release depends on the location of the accident and rate of vapor dispersion from the surface of the spill. Staff evaluated the risk of accidental release during transportation using specified data and methodologies. (*Id*.) Staff's modeling results support the conclusion that the risk of exposure to significant concentrations of HTF during transport is insignificant. This primarily because there is a remote possibility that an accidental release of sufficient quantity could be dangerous to the public.

3. Seismic Risk

The AMS site is in a seismically active region, and could potentially be subject to earthquakes that could cause the failure of hazardous material storage facilities and/or solar field piping. An analysis of potential seismic risks at the AMS site was conducted based on data from historic earthquake events, related damage to storage and pipeline facilities, the proposed use of flexible pipeline connectors (e.g., ball joints) and isolation valves (as previously described), and project-related conformance with applicable regulatory requirements (e.g., seismic parameters of the California Building Code). The evidence indicates that storage facility and/or pipeline failures at the AMS site from seismic events are not probable, and do not represent a significant risk to the public. Additional discussion of potential seismic concerns and related design features is provided in the **Geological Resources** and **Facility Design** sections of this Decision. (Exs. 1, p. 5.6-25.; 301, p. 5.4-12.)

4. Site Security

Because the AMS project use and store large quantities of hazardous materials, site security is essential even though the site is deemed "low vulnerability" based on a regulatory-based vulnerability assessment. The evidence identifies site security measures for this project commensurate with its level of vulnerability and consistent with measures at all power plants under Energy Commission jurisdiction, to provide a minimum level of security consistent with the noted regulatory guidelines. (Ex. 301, pp. 5.4-13 -5.4-14.) These measures include perimeter fencing, security guards, and access controls, as well as establishing protocols for monitoring/reporting suspicious activities and site evacuation. Site access must be strictly controlled. Conditions of Certification **HAZ-5** and **HAZ-6** set forth the required security measures.

5. Cumulative Impacts

A cumulative effect refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effects of the proposed project. (Pub. Res. Code § 21083, Cal. Code Regs., tit. 14, §§ 15064(h), 15065(c), 15130, and 15355.)

The evidence includes a cumulative impacts analysis. The evidence shows that while cumulative impacts related to hazardous material management at applicable existing and foreseeable facilities (including the AMS project) are possible, the probability for cumulative impacts is low due to the numerous safeguards required to both prevent and control the release of hazardous materials at such facilities.

Specifically, the AMS project (along with other similar facilities) will be subject to hazardous materials use, handling, storage, and transport requirements that are independent of any other projects considered for potential cumulative impacts. Based on these requirements, the evidence states that individual solar power facilities (including the AMS project) pose a minimal risk of off-site impacts from accidental release (about one in one million per year), and that the probability of such impacts occurring simultaneously at more than one facility is very low. (Exs. 1, p. 5.6-26, 301, pp. 5.4-14 - 5.4-15.) Accordingly, the evidence establishes that the AMS facility would not contribute to significant hazardous materials-related cumulative impacts.

FINDINGS OF FACT

Based on the persuasive weight of the evidence as outlined in the Decision, the Commission makes the following findings and reaches the following conclusions:

1. The AMS project will use hazardous materials during construction and operation, including natural gas, HTF (Therminol VP-1 or equivalent), and petroleum.
2. The major public health and safety hazards are associated with the risk of fire and/or explosion related to natural gas and HTF, as well as environmental concerns from the release of petroleum.
3. The risk of fire and/or explosion from natural gas will be reduced to insignificant levels through adherence to applicable codes and the implementation of effective safety management practices. Specifically, this will include the use of double block and bleed valves for secure shut off, automated combustion controls, burner management, inspection of welds, and use of corrosion resistant coatings.
4. The risk of off-site HTF migration is minimal, and the risk of on-site HTF leaks and related fire hazards will be reduced to insignificant levels through the

placement of an adequate number of isolation valves in the HTF pipe loops throughout the solar array. Specifically, these valves will be automatically, manually, remotely, and/or locally activated, and will allow individual loops to be closed if a leak develops without closing off the entire HTF system and shutting down the plant.

5. Potential leak/fire risks associated with road crossings by HTF pipes and other project facilities will be reduced to insignificant levels by placing applicable facilities beneath roadway crossings and within protective structures.

6. The risk of spills/leaks and related environmental hazards associated with the on-site use and storage of petroleum will be reduced to insignificant levels through conformance with applicable regulatory requirements. Specifically, this will entail implementation of an approved SPCC Plan, including measures such as spill containment and prevention systems, personnel training, emergency response procedures, and spill notification protocols.

7. HTF poses the predominant risk associated with hazardous materials transport. The risk of an accidental release during HTF transport in the project area will be reduced to insignificant levels by conformance with applicable regulatory requirements, including standards for vehicle safety and driver qualifications/competence.

8. While the AMS site could potentially be subject to earthquakes that result in the failure of hazardous material storage facilities and/or solar field piping, such occurrences are not probable and do not represent a significant risk to the public.

9. The AMS project will involve on-site hazardous material use/storage in sufficient quantities to merit the development of special site security measures to prevent unauthorized access. These measures would ensure that potential security risks related to construction and operation of the AMS facility would be less than significant.

10. Hazardous materials proposed for use in the construction and operation of the AMS project, when considered in conjunction with those used at other existing and potential future facilities in the project vicinity, will not cumulatively result in a significant risk to the public.

11. The AMS project will be designed with an operating life of approximately 30 to 40 years. While it is not possible to identify specific circumstances and requirements related to facility closure, this process process would conform with applicable LORS in such a way that public health and safety and the environment are protected from adverse impacts.

12. Implementation of the mitigation measures contained in the following Conditions of Certification will ensure that the AMS project will not cause significant impacts to public health and safety as the result of the use, handling, storage, or transport of hazardous materials.

13. With implementation of the Conditions of Certification listed below, the AMS project will comply with all applicable LORS related to hazardous materials management.

CONCLUSION OF LAW

1. We therefore conclude that the use of hazardous materials in association with the AMS project will not result in any significant direct, indirect, or cumulative adverse public health and safety impacts.

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.

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 collector loop in the event of a leak of fluid. These valves shall be actuated automatically, manually, 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.

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; **<u>or</u>**

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

and

the CCTV able to view 100% of the power block perimeters

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

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.

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.

SAMPLE CERTIFICATION (Attachment A)

Affidavit of Compliance for Project Owners

I, _____

(Name of person signing affidavit)(Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of

_____

(Company name)

for employment at

_____

(Project name and location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

SAMPLE CERTIFICATION (Attachment B)

Affidavit of Compliance for Contractors

I, _____

(Name of person signing affidavit)(Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of

_____

(Company name)

for contract work at

_____

(Project name and location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

SAMPLE CERTIFICATION (Attachment C)

Affidavit of Compliance for Hazardous Materials Transport Vendors

I, _____

(Name of person signing affidavit)(Title)

do hereby certify that the below-named company has prepared and implemented security plans in conformity with 49 CFR 172.802 and has conducted employee background investigations in conformity with 49 CFR 172, subparts A and B,

_____

(Company name)

for hazardous materials delivery to

_____

(Project name and location)

as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

HAZARDOUS MATERIALS
APPENDIX A

Hazardous Materials Proposed for Use at AMS

During Operations

Hazardous Materials Management Appendix A
Hazardous Materials Proposed for Use at AMS During Operations

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site	CERCLA SARA RQ[a]
Acetylene	74-86-2	Welding gas	Health: hazardous if inhaled Physical: combustible, flammable	1,600 cubic feet	N/A
Air Conditioning Fluids	None			40 pounds	N/A
Argon	7440-37-1	Welding gas	Health: low toxicity Physical: non reactive	1,600 cubic feet	N/A
Bathroom Supplies – Liquid Soap	None			25 gallons	N/A
Chem Treat, Inc. BL-1260 or similar Carbohydrazide	497-18-7		Health: moderate toxicity	Totes, 4 x 300 gallons	N/A
ChemTreat, Inc. BL-1558 or similar 3-Methoxyproplyamine Cyclohexlyamine Diethydroxylamine	 5332-73-0 108-91-8 3710-84-7		Health: high toxicity Physical: corrosive, combustible	Totes, 4 x 300 gallons	 N/A 10,000 pounds N/A
ChemTreat, Inc. BL-180 or similar Nitrous Acid, Sodium Salt Sodium Tetraborate Pentahydrate	 7632-00-0 12179-04-3		Health: moderate toxicity	Totes, 2 x 300 gallons	 100 pounds N/A

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site	CERCLA SARA RQ[a]
ChemTreat, Inc. CL-1432 or similar Potassium Phosphate, Tribasic 1-Hydroxyethylidene-1, 1-Diphosphonic Acid, Tetrapotassium Salt Tetrapotassium Pyrophosphate Potassium Hydroxide Tolytriazole, Sodium Salt	 7778-53-2 14860-53-8 7320-34-5 1310-58-3 64665-57-2		Health: high toxicity Physical: corrosive	Totes, 2 x 1,000 gallons	 N/A N/A N/A 1,000 pounds N/A
ChemTreat, Inc. BL-124 or similar Sodium Bisulfite	7631-90-5		Health: low toxicity, irritant	Totes, 2 x 300 gallons	5,000 pounds
ChemTreat, Inc. BL-1794 or similar Trisodium Phosphate	7601-54-9		Health: high toxicity Physical: corrosive	Plastic Totes, 2 x 300 gallons	N/A
Cleaning Chemicals (Janitorial Supplies)	None	Periodic cleaning of combustion turbine	Health: various Physical: various	20 gallons	NA
Diesel Fuel			Health: low toxicity Physical: combustible	14,200 gallons	N/A
Fertilizer (Bioremediation) Urea	57-13-6 1317-25-5		Health: low toxicity	300 pounds	N/A
Fertilizer (Bioremediation)	7778-77-0		Health: low toxicity	2,000 pounds	N/A

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site	CERCLA SARA RQ[a]
Monopotassium Phosphate			Physical: combustible		
Gasoline	86290-81-5			1,000 – 2,000 gallons	N/A
Heat Transfer Fluid: Diphenyl Ether (73.5%) Biphenyl (26.5%)	101-84-8 92-52-4	Heat transfer from solar array to steam generator	Health: moderately toxic, skin irritant Physical: combustible	2,292,000 gallons	100 pounds
Herbicide Roundup® or equivalent (Glyphosate, Isopropylamine Salt)	38641-94-0		Health: low toxicity, irritant	No onsite storage, brought on site by licensed contractor, used immediately	N/A
Herbicides and Pesticides	None			5 gallons	N/A
Lab Gases	None			150 cubic feet	N/A
Lab Reagents	None			10 gallons	N/A
Lube Oil	64742-55-8	Lubricate rotating equipment	Health: hazardous if ingested Physical: may be flammable/combustible	5,00 gallons in equipment and piping, additional maintenance inventory of up to 550 gallons in 55-gallon steel drums	N/A
Mineral Insulating Oil	64742-53-6 68037-01-4	Transformers/switchyard	Health: hazardous if ingested Physical: may be flammable/combustible	64,000 gallons	N/A
Natural Gas (Methane)	74-82-8	Auxiliary boiler and domestic use (space heating)	Health: low toxicity Physical: flammable	No on-site storage, natural gas in equipment and piping; pressurized carbon steel pipeline for delivery to site	N/A
Nitrogen	7727-37-9			37,200 gallons	N/A
Office Supplies (Batteries, etc)	None			1 cubic foot	N/A
Oxygen	7782-44-7	Welding gas	Health: low toxicity, skin irritant Physical: flammable	3,200 cubic feet	NA

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site	CERCLA SARA RQ[a]
Paint and Paint Thinners	Various	Touchup of painted surfaces	Health: various Physical: various	50 gallons	NA
Propane	74-98-6	Torch gas	Health: low toxicity, causes frostbites Physical: flammable, oxidizing	5,000 gallons	NA
Sodium Hydroxide	1310-73-2	Water treatment	Health: high toxicity Physical: corrosive	2,000 gallons	1,000 pounds
Sodium Hypochlorite	7681-52-9 10022-70-5	Water treatment	Health: low toxicity Physical: corrosive, flammable	12,000 gallons	100 pounds
Soil Stabilizer Coherex or similar	64742-11-6		None	No onsite storage, supplied in 400-gallon totes, used immediately	N/A
Sulfuric Acid (29.5%)	7664-93-9 8014-95-7	Water treatment	Health: high toxicity Physical: corrosive and water reactive	2,000 gallons	1,000 pounds
Sulfuric Acid (93%)	7664-93-9 8014-95-7	Water treatment	Health: high toxicity Physical: corrosive and water reactive	1,600 gallons	1,000 pounds
Water Treatment Chemical ChemTreat, Inc. CT-9004 or similar 1-Hydroxyethylidene-1, 1-Diphosphonic Acid	2809-21-4			Totes, 2 x 300 gallons	N/A
Water Treatment Chemical ChemTreat, Inc. P-813 E or similar Petroleum Distillate Hydrotreated	64742-47-8		None	Totes, 2 x 275 gallons	N/A

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site	CERCLA SARA RQ[a]
Light					
Water Treatment Chemical ChemTreat, Inc. CL-2156 or similar 5-Chloro-2-Methyl-4-Isothiazolin-3-One 2-Methyl-4-Isothiazolin-3-One Magnesium Nitrate Magnesium Chloride	 26172-55-4 2682-20-4 10377-60-3 7786-30-3		Physical: corrosive	Totes, 2 x 300 gallons	 N/A N/A N/A N/A
Welding Rods	7439-89-6			100 pounds	N/A

Source: ESH 2009c Tables 9 and 10 and AS 2009a Table 5.6-3

a. Reportable quantities for a pure chemical, per the Comprehensive Environmental Response, Compensation, and Liability Act.

F. WASTE MANAGEMENT

The AMS project will generate hazardous and non-hazardous wastes during construction and operation. This analysis identifies existing site conditions related to the potential occurrence of hazardous and non-hazardous wastes, and reviews the proposed waste management plans for reducing the risks and environmental impacts associated with the project-related handling, storage, and disposal of hazardous and non-hazardous wastes. Solar power facilities are also subject to a number of laws, ordinances, regulations, and standards (LORS) related to the proper handling, storage, and disposal of hazardous and non-hazardous wastes. The evidence incorporates all of these considerations in the analysis of potential impacts, as summarized below. Additional information related to project wastewater issues is provided in the **Soil and Water Resources** section of this Decision, while additional discussion of waste management and related concerns is provided in the **Worker Safety** and **Hazardous Materials Management** sections of this Decision.

The evidence was undisputed. (6/28/10 RT 65-76, 81, Exs.1, §5.16, Appendix I, 4 [Items 78-86], 20, 22, 25, 26, 34, 48 [§ 14.0], 301, § 5.13, 306.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

The evidence includes an assessment of the potential risks and environmental impacts associated with hazardous and non-hazardous wastes. This assessment included the following elements:

- An assessment of existing site conditions and the potential for contamination associated with prior activities on or near the project site; and

- Analysis of potential impacts from the generation and management of wastes during project construction and operation.

1. Existing Site Conditions

The AMS project certification process requires a Phase I Environmental Site Assessment (ESA) to provide the history of how the site has been used, compile a list of hazardous waste releases on or near the site, and document the presence of any actual or potential soil or water contamination. If there is reasonable potential that the site contains hazardous substances, a Phase II

ESA must be conducted to analyze the contamination and to establish a remediation plan. The Phase II ESA usually includes sampling and testing of potentially contaminated media to verify the level of contamination and the potential for remediation at the site.

A Phase I ESA dated May 28, 2009, was completed for the AMS site and identified areas of interest including: remnants of a previous cattle farming operation (pens, watering/feeding toughs), fallow agriculture, aboveground storage tanks, vent pipes normally associated with underground storage tanks (USTs), solid waste debris, existing buildings and structural ruins, and visible staining on soil and concrete throughout the site. Based on these results, a Phase II sampling analysis was conducted in March 2010, and identified four items of environmental concern that require remediation prior to site demolition and construction of the AMS facility. Specifically, these four items include asbestos-containing material, lead-based paint, a non-operational UST previously used for aviation fuel, and hazardous material/wastes located in the basement of an abandoned general store building. A number of older buildings on the site may also contain hazardous substances such as asbestos, arsenic, lead, mercury and polychlorinated biphenyls (PCBs) associated with facilities/wastes including treated wood, paints and coatings, plumbing and pipes, fluorescent lamps, batteries, thermostats and switches. All of these items of environmental concern require either proper removal/disposal of the hazardous materials, or if remediation is required, coordination with the Lahontan Regional Water Quality Control Board (LRWQCB) and/or the State Department of Toxic Substances Control (DTSC) in the Voluntary Cleanup Program. (Exs. 1, p. 5.16-11 – 5.5-12, Appendix I, 301, pp. 5.13-8 - 5.13-12.)

Identified potential environmental concerns related to existing site conditions will be addressed through Conditions of Certification **WASTE-1** through **WASTE-6**, and **WASTE-8**. Specifically, **WASTE-1** requires that removal/disposal of the on-site UST is conducted under the oversight of San Bernardino County Fire Department, with Energy Commission Compliance Project Manager (CPM) involvement. **WASTE-2** will require the project owner to obtain a hazardous waste generator identification number from the U.S. Environmental Protection Agency (USEPA) prior to any generation of hazardous wastes. **WASTE-3** requires the project owner to ensure that the site is properly characterized and (if necessary) remediated prior to construction (potentially including hazardous waste removal/disposal). **WASTE-4** requires that a professional engineer or professional geologist inspect the site if potentially contaminated soil is encountered during site characterization or grading activities, and **WASTE-5**

requires the project owner to submit resumes of the professional engineer or professional geologist to the CPM for review and approval.

2. Construction

Construction of the AMS project and its associated facilities will generate non-hazardous and hazardous wastes in both solid and liquid forms, as identified in **Waste Management Attachment A.**

Non-Hazardous Wastes

Approximately 40 cubic yards per week of non-hazardous solid wastes will be generated during construction, including paper, wood, and glass; plastics from packing materials; waste lumber, insulation, metal and concrete; and empty non-hazardous containers. These no-hazardous wastes will be recycled to the maximum extent possible in conformance with associated regulatory standards, including AB 939, which requires that all local jurisdictions divert waste from landfill disposal by 50 percent through means such as recycling or material recovery.

Non-recyclable non-hazardous wastes from project construction will be collected by a licensed hauler and disposed of in an appropriate Class III solid waste disposal facility, or in clean fill sites. Condition of Certification **WASTE-6** requires the project owner to prepare a Construction Waste Management Plan for all wastes generated during construction of the AMS facility, and to submit the Plan to the CPM for review and approval. Condition of Certification **WASTE-7** requires the project owner to identify the proposed waste hauler and facilities to receive the waste, as well as to document the type and volume of waste disposal (with these records to be located at the site and accessible to applicable regulatory agencies). These measures will ensure that potential risks and environmental impacts associated with non-hazardous waste disposal and management during project construction will be less than significant. (Ex. 301, pp. 5.13-11 - 5.13-12.)

Non-hazardous liquid wastes will also be generated during project construction, including sanitary waste. Additional discussion of the management of project wastewater is provided in the **Soil and Water Resources** section of this Decision.

Hazardous Wastes

Project construction (including demolition and grading as previously discussed) will encounter or generate a number of associated hazardous wastes. These include asbestos-containing material, lead-based paint, a non-operational underground storage tank (UST) previously used for aviation fuel, and hazardous material/wastes located in the basement of an abandoned general store building and potentially other on-site structures. Conditions of Certification **WASTE-1** through **WASTE-6**, and **WASTE-8**, described above, will ensure that all environmental risks and impacts associated with these particular wastes are less than significant.

Additional hazardous wastes anticipated to be generated during project construction include waste paint, spent construction solvents, waste cleaners and adhesives, waste oil, oily rags, waste batteries, and spent welding materials. (Exs. 1, Table 5.16-5, 301, pp. 5.13-12 -5.13-13.) The evidence explains how these materials will be disposed. For instance, empty hazardous material containers will be returned to the vendor or disposed of at a hazardous waste facility; solvents, used oils, paint, oily rags, and adhesives will be recycled or disposed of at a hazardous waste facility; and spent batteries will be disposed of at a recycling facility. (Exs. 1, p. 5.16-4, 301, pp. 5.13-12 - 5.13-13)

The construction contractor and/or the project owner/operator is required by Condition of Certification **WASTE-2** to obtain a unique hazardous waste generator identification number for the site prior to starting construction, pursuant to proposed Condition of Certification **WASTE-2**. This will ensure compliance with California Code of Regulation Title 22, Division 4.5. Hazardous waste will be collected in hazardous waste accumulation containers and stored in a lay down area, warehouse/shop area, or storage tank on equipment skids for less than 90 days. The accumulated wastes will then be properly manifested, transported, and disposed of at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies.

Furthermore, implementation of Condition of Certification **WASTE-2**, along with the Applicant's proposed measures, will provide conformance with all applicable LORS related to hazardous waste generation/disposal during construction, and will ensure that all associated environmental risks and impacts are less than significant. (Exs. 1, pp. 5.16-9 – 5.16-12, 301, pp. 5.13-12 - 5.13-13.)

In the event that construction excavation, grading, or trenching activities for the proposed project encounter potentially contaminated soils, specific handling,

disposal and other precautions may be necessary. The evidence shows that proposed Conditions of Certification **WASTE-4** and **WASTE-5**, as previously described, will be adequate to address any soil contamination contingency that may be encountered during construction of the project and will ensure compliance with related LORS. Absent any unusual circumstances, project compliance with LORS will be sufficient to ensure that no significant impacts occur during construction as a result of project waste management activities. (Ex. 301, p. 5.13-13.)

Based on the evidence, we conclude that implementation of Conditions of Certification **WASTE-1** through **WASTE-8** will ensure that all potential risks and environmental impacts associated with hazardous and non-hazardous waste generation and management during project construction are less than significant (including site characterization, demolition and remediation efforts related to existing site conditions).

3. Operation

The proposed AMS project will generate both non-hazardous and hazardous wastes in solid and liquid forms under normal operating conditions, as summarized in **Waste Management Attachment A**. Specifically, non-hazardous wastes will include substances such as heat transfer fluid (HTF) waste from spills (with HTF also potentially comprising hazardous waste depending on concentrations, as outlined below), spent dematerialized resin, cooling tower basin sludge, and spent softener resin. Annual non-hazardous wastes generation from project operation is estimated to total approximately 5,000 cubic yards, including 750 cubic yards of HTF-contaminated soil with concentrations of less than 10,000 mg/kg. (Exs. 1, Table 5.16-6, pp. 5.16-15 - 5.16-16, 301, pp. 5.13-14 - 5.13-16;.)

Hazardous wastes generated during facility operation will include used hydraulic fluids, oils, greases, oily filters and rags, cleaning solutions and solvents, batteries, and potential HTF spills, depending on concentrations. In addition, spills and unauthorized releases of hazardous materials or hazardous wastes may generate contaminated soils or materials that may require corrective action and management as hazardous waste. Hazardous wastes will be recycled to the extent possible and practical, with remaining hazardous wastes to be transported to an appropriate (Class I) permitted disposal facility. Annual hazardous waste generation from project operation requiring off-site disposal is estimated to include approximately 43 cubic yards, including 10 cubic yards of HTF-

contaminated soil with concentrations of greater than 10,000 mg/kg, and 33 cubic yards of other non-recyclable hazardous waste. (Exs. 1, pp. 5.16-15 - 5.16-16, 301, pp. 5.13-13, 5.13-17.)

Before operations can begin, the project owner will be required to develop and implement an Operations Waste Management Plan as required in the proposed Condition of Certification **WASTE-9**. This Plan requires detailed descriptions of all operation and maintenance waste streams, as well as related management methods, agency correspondence and documentation requirements. As previously described, Condition of Certification **WASTE-2** will require obtaining a unique hazardous waste generator identification number for the site prior to starting construction.

Additional requirements related to waste management during project operation and maintenance are identified in Conditions of Certification **WASTE-10** through **WASTE-12**. (Ex. 301, pp. 5.13-15 - 5.13-16.) Specifically, **WASTE-10** requires the Applicant to assess HTF-contaminated soil to determine if concentrations exceed hazardous waste levels (as described above and pursuant to applicable test protocols), submit the results to the CPM and the Department of Toxic Substances Control for approval, and dispose of HTF wastes accordingly (refer to the **Hazardous Materials Management** section of this Decision for additional discussion of the proposed use and risks associated with HTF). If HTF concentrations are below hazardous levels, the contaminated soils will be stored and treated in the proposed on-site bioremediation/land farm unit (or Land Treatment Unit).

Additionally, if the concentrations of HTF in the affected soils indicate they can be stored and treated in the Land Treatment Unit, the Applicant will be required to comply with Condition of Certification **SOIL&WATER-2** (refer to the **Soil and Water Resources** section of this Decision for further discussion of this requirement). **WASTE-11** requires the project owner to test cooling tower basin sludge per applicable regulatory requirements and report the findings to the CPM to ensure the proper method of disposal. **WASTE-12** requires the project owner/operator to report, clean up, and remediate, as necessary, any hazardous materials spills or releases in accordance with all applicable federal, state, and local requirements. Refer to the **Hazardous Materials Management** section of this Decision for additional discussion of project hazardous material management, spill reporting, containment, and spill control and countermeasures plan provisions.

Hazardous wastes generated during the operation of the AMS project will be minor, with source reduction and recycling of wastes implemented whenever possible. The hazardous wastes will be temporarily stored on site, transported off site by licensed hazardous waste haulers, and recycled or disposed of at authorized disposal facilities in accordance with established standards applicable to generators of hazardous waste. (Ex. 301, p. 5.13-16.)

Thus, with implementation of Conditions of Certification **WASTE-2** and **WASTE-9** through **WASTE-12**, along with proposed project design features, all potential risks and environmental impacts associated with hazardous and non-hazardous waste generation and management during project operation will be less than significant.

4. Disposal

As previously noted, construction and operation of the AMS project will involve the off-site disposal of non-recyclable hazardous and non-hazardous wastes at authorized facilities. Specifically, the evidence shows that project construction will entail the disposal of approximately 4,264 cubic yards of non-hazardous waste and 121 cubic yards of hazardous waste during the two-year construction period. Project operation will require the annual off-site disposal of approximately 5,000 cubic yards of non-hazardous wastes, and 43 cubic yards of hazardous waste. (Ex. 301, p. 5.13-17.) Non-hazardous waste associated with project construction and operation will be disposed of at one of more of the five currently permitted Class III landfills in San Bernardino County, which have a combined remaining capacity of over 126 million cubic yards (with estimated closure dates ranging from 2012 to 2042). The evidence shows that the disposal of non-hazardous waste related to the AMS project will not significantly impact the remaining capacity or operating life of any of the noted five existing Class III facilities. (Ex. 301, pp. 5.13-16 - 5.13-17.)

Hazardous waste disposal associated with construction and operation of the AMS project will occur at either the Clean Harbor's Class I Buttonwillow site in Kern County or the Kettleman Hills Class I site in Kings County, or both. These two sites have a combined remaining hazardous waste capacity of approximately 16 million cubic yards with estimated remaining operating lives of about 40 and 30 years, respectively. In addition, the Kettleman Hills facility in the process of permitting an additional 15 million cubic yards of hazardous waste disposal capacity. (Exs. 1, p. 5.16-9 -5.16-11, 301, p. 5.13-17.) The evidence establishes that the disposal of hazardous waste related to the AMS project will not

significantly impact the remaining capacity or operating life of either of the noted existing Class I facilities.

5. Cumulative Impacts

A cumulative effect refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effects of the proposed project. [Pub. Res. Code § 21083, Cal. Code Regs., tit. 14, §§ 15064(h), 15065(c), 15130, and 15355.]

An analysis of potential cumulative impacts was conducted for the AMS project, in conjunction with existing and foreseeable future projects in the site vicinity. The evidence shows that no projects were identified in the AMS site vicinity that would create significant cumulative waste management impacts when considered together with the AMS project. (Exs. 1, p. 5.16-18, 301, pp. 5.13-17.)

FINDINGS OF FACT

Based on the evidence, we make the following findings and reach the following conclusions:

1. Based on Phase I and II ESAs conducted at the proposed AMS project site, existing potential hazardous waste issues were identified in relation to asbestos-containing material; lead-based paint; a non-operational UST previously used for aviation fuel; hazardous material/wastes located in the basement of an abandoned general store building; and other hazardous substances (such as arsenic, lead, mercury and PCBs) in several older on-site buildings. All of these items of environmental concern will require either proper removal/disposal of the hazardous materials, or if remediation is required, coordination with applicable LORS.

2. The AMS project will generate a number of hazardous and non-hazardous wastes during construction and operation, as summarized in **Waste Management Attachment A**.

3. All hazardous and non-hazardous wastes generated in association with project construction and operation will be recycled, reused or remediated to the maximum extent practical.

4. Project-related wastes that cannot be recycled, reused or remediated will be disposed of in appropriate landfills for hazardous (Class I facilities) and non-hazardous (Class III facilities) wastes.

5. Disposal of project-related hazardous and non-hazardous wastes at appropriate landfill sites will not result in significant adverse impacts to the capacity or remaining operation life of any of the noted existing Class I or Class III facilities.

6. The Conditions of Certification set forth below and in the **Soil & Water Resources** section of this Decision, along with the AMS project design measures, will ensure that the AMS project will reduce potential project-related waste management impacts to less than significant levels.

7. With implementation of the Conditions of Certification listed below, the AMS project will comply with all applicable LORS related to waste management.

CONCLUSION OF LAW

1. The proposed AMS project will not result in any significant direct, indirect, or cumulative adverse impacts related to waste management.

CONDITIONS OF CERTIFICATION

WASTE-1 Prior to the removal of any underground storage tanks (USTs) found on site, the project owner shall submit a copy of the information typically required to obtain a permit to the San Bernardino County Fire Department for review and comment. The CPM and the San Bernardino County Fire Department must acknowledge receipt of the plans for the removal prior to CPM approval. The project owner shall obtain approval for removal of all located USTs from the CPM.

Verification: No less than sixty (60) days prior to commencement of site mobilization, the project owner shall provide the plans to remove the underground storage tanks to the CPM for review and approval. The project owner shall inform the CPM via the monthly compliance report, of the data when all USTs were removed from the site.

WASTE-2 The project owner shall obtain a hazardous waste generator identification number from the United States Environmental Protection Agency prior to generating any hazardous waste during project construction and operations.

Verification: The project owner shall keep a copy of the identification number on file at the project site and provide documentation of the hazardous waste generation notification and receipt of the number to the CPM in the next

scheduled Monthly Compliance Report after receipt of the number. Submittal of the notification and issued number documentation to the CPM is only needed once unless there is a change in ownership, operation, waste generation, or waste characteristics that requires a new notification to USEPA. Documentation of any new or revised hazardous waste generation notifications or changes in identification number shall be provided to the CPM in the next scheduled compliance report.

WASTE-3 The project owner shall ensure that the Abengoa Mojave Solar One (AMS) Project site is properly characterized and remediated as necessary pursuant to LRWQCB or DTSC Voluntary Site Cleanup Programs. In no event shall project construction commence in areas requiring characterization and remediation until LRWQCB or DTSC, and CEC CPM have determined that all necessary remediation has been accomplished as necessary.

Verification: The project owner shall submit to the CPM copies of all pertinent correspondence, work plans, agreements, and authorizations between the AMS Project and LRWQCB or DTSC regarding Voluntary Site Cleanup Program requirements and activities at the AMS project site. The CPM shall review and comment on the proposed Cleanup Program requirements and activities. At least 60 days prior to the start of site mobilization, the project owner shall provide to the CPM written notice from San LRWQCB/DTSC that the AMS site has been investigated and remediated, as necessary, for compliance with the Voluntary Cleanup Program.

WASTE-4 If potentially contaminated soil is identified during site characterization, demolition, excavation, or grading at either the proposed site or linear facilities, as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the professional engineer or professional geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and provide a written report to the project owner, LRWQCB/DTSC, and the CPM stating the recommended course of action.

Depending on the nature and extent of contamination, the professional engineer or professional geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the professional engineer or professional geologist, significant remediation may be required, the project owner shall contact the CPM and representatives of LRWQCB/DTSC for guidance and possible oversight.

Verification: The project owner shall submit any final reports filed by the professional engineer or professional geologist to the CPM within 5 days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

WASTE-5 The project owner shall provide the resume of an experienced and qualified Professional Engineer or Professional Geologist, who shall be available for consultation during building removal, and soil excavation and grading activities, to the CPM for review and approval. The resume shall demonstrate experience in remedial investigation and feasibility studies.

The registered professional engineer or geologist shall be given full authority by the project owner to oversee and modify earth-moving activities to prevent the release or disturbance of contaminated soil.

Verification: At least 30 days before the start of site mobilization, the project owner shall submit the resume to the CPM for review and approval.

WASTE-6 The project owner shall prepare a Construction Waste Management Plan for all wastes generated during construction of the facility, and shall submit the plan to the Compliance Project Manager (CPM) for review and approval. The plan shall contain, at a minimum, the following:

- a description of all construction waste streams, including projections of frequency, amounts generated and hazard classifications;
- a survey of structures to be demolished that identifies the types of waste to be managed; and
- management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods, and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

Verification: No fewer than 30 days before the start of site mobilization, the project owner shall submit the Construction Waste Management Plan to the CPM for approval.

WASTE-7 During the construction and operation phase, the project owner shall maintain copies of the contracted waste and/or refuse haulers documentation of each waste load transferred from the construction site to a disposal site and/or recycling center. The project owner shall maintain the haulers lists of the names of permitted solid waste facilities or recycling centers locations receiving the project's construction waste, and copies of all weigh tickets.

Verification: The project owner shall identify permitted solid waste facilities or recycling centers that receive construction waste and maintain copies of weigh tickets and manifests showing the type and volume of waste disposed. This

information shall be maintained at the project site and made accessible to CPM and the San Bernardino County Environmental Health Service Department Solid Waste Program.

WASTE-8 Prior to demolition of existing structures, the project owner shall complete and submit a copy of a MDAQMD Asbestos Demolition Notification Form to the CPM and the MDAQMD for approval. After receiving approval, the project owner shall remove all Asbestos Containing Material (ACM) from the site prior to demolition.

Verification: No less than 60 days prior to commencement of structure demolition, the project owner shall provide the Asbestos Demolition Notification Form to the CPM for review and approval. The project owner shall inform the CPM via the monthly compliance report, of the data when all ACM is removed from the site.

WASTE-9 The project owner shall prepare an Operation Waste Management Plan for all wastes generated during operation of the facility (including construction, operation and dismantling of the onsite manufacturing building) and shall submit the plan to the CPM for review and approval. The plan shall contain, at a minimum, the following:

- a detailed description of all operation and maintenance waste streams, including projections of amounts to be generated, frequency of generation, and waste hazard classifications;
- management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to ensure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans;
- information and summary records of conversations with the local Certified Unified Program Agency and the Department of Toxic Substances Control regarding any waste management requirements necessary for project activities. Copies of all required waste management permits, notices, and/or authorizations shall be included in the plan and updated as necessary;
- a detailed description of how facility wastes will be managed and any contingency plans to be employed, in the event of an unplanned closure or planned temporary facility closure; and
- a detailed description of how facility wastes will be managed and disposed upon closure of the facility.

Verification: The project owner shall submit the Operation Waste Management Plan to the CPM for approval no less than 30 days prior to the start

of project operation. The project owner shall submit any required revisions to the CPM within 20 days of notification from the CPM that revisions are necessary. The project owner shall also document in each Annual Compliance Report the actual volume of wastes generated and the waste management methods used during the year; provide a comparison of the actual waste generation and management methods used to those proposed in the original Operation Waste Management Plan; and update the Operation Waste Management Plan, as necessary, to address current waste generation and management practices.

WASTE-10 The project owner shall submit to the CPM and DTSC for approval the Applicant's assessment of whether the HTF contaminated soil is considered hazardous or non-hazardous under state regulations. HTF-contaminated soil that exceeds the hazardous waste levels must be disposed of in accordance with California Health and Safety Code (HSC) Section 25203. HTF-contaminated soil that does not exceed the hazardous waste levels may be discharged into the land treatment unit. For discharges into the land farm, the project owner shall comply with the Waste Discharge Requirements contained within in the **Soil & Water Resources** section of this Decision.

Verification: The project owner shall document all releases and spills of HTF as described in Condition of Certification **WASTE-9** and as required in the **Soil & Water Resources** section of this Decision. Cleanup and temporary staging of HTF-contaminated soils shall be conducted in accordance with the approved Operation Waste Management Plan required in Condition of Certification of **WASTE-6**. The project owner shall sample HTF-contaminated soil in accordance with the United States Environmental Protection Agency's (USEPA) current version of "Test Methods for Evaluating Solid Waste" (SW-846). Samples shall be analyzed in accordance with USEPA Method 1625B or other method to be reviewed and approved by DTSC and the CPM.

Within 28 days of an HTF spill the project owner shall provide the results of the analyses and their assessment of whether the HTF-contaminated soil is considered hazardous or non-hazardous to DTSC and the CPM for review and approval.

If DTSC and the CPM determine the HTF-contaminated soil is considered hazardous it shall be disposed of in accordance with California Health and Safety Code (HSC) Section 25203 and procedures outlined in the approved Operation Waste Management Plan required in Condition of Certification **WASTE-9** and reported to the CPM in accordance with Condition of Certification **WASTE-12**.

If DTSC and the CPM determine the HTF-contaminated soil is considered non-hazardous it shall be retained in the land farm and treated on-site in accordance with the Waste Discharge Requirements contained in the **Soil & Water Resources** section of this Decision.

WASTE-11 The project owner shall ensure that the cooling tower basin sludge is tested pursuant to Title 22, California Code of Regulations, and section 66262.10 and report the findings to the CPM. The handling, testing, and disposal methods for sludge shall be identified in the Operation Waste Management Plan required in Condition of Certification **WASTE-9**.

Verification: The project owner shall report the results of filter cake testing to the CPM within 30 days of sampling. If two consecutive tests show that the sludge is non-hazardous, the project owner may apply to the CPM to discontinue testing. The test results and method and location of sludge disposal shall also be reported in the Annual Compliance Report required in Condition of Certification **WASTE-9**.

WASTE-12 The project owner shall ensure that all spills or releases of hazardous substances, materials, or waste are reported, cleaned up, and remediated as necessary, in accordance with all applicable federal, state, and local requirements.

Verification: The project owner shall document all unauthorized releases and spills of hazardous substances, materials, or wastes that are in excess of reportable quantities (RQs) that occur on the project property or transmission corridors during construction and on the project property during operation. The documentation shall include, at a minimum, the following information:

- location of release;
- date and time of release;
- reason for release;
- volume released;
- amount of contaminated soil/material generated;
- how release was managed and material cleaned up;
- if the release was reported;
- to whom the release was reported;
- release corrective action and cleanup requirements placed by regulating agencies;
- level of cleanup achieved and actions taken to prevent a similar release or spill; and
- disposition of any hazardous wastes and/or contaminated soils and materials that may have been generated by the release.

Copies of the unauthorized spill documentation shall be provided to the CPM within 30 days of the date the release was discovered.

Waste Management Attachment A
Summary of Waste Streams and Management Methods

Waste Stream and Management Method Classification[1]	Origin and Composition	Estimated Amount	Estimated Frequency of Generation	Waste Management Method	
				On-site	Off-site
Construction					
Construction waste - Hazardous	Empty hazardous material containers	1 cubic yard per week (cy/wk)	Intermittent	None. Accumulate onsite for <90 days	Return to vendor or dispose in a permitted waste disposal facility
Construction waste - Hazardous	Solvents, used oil, paint, oily rags	175 gallons	Every 90 days	None. Accumulate onsite for <90 days	Recycle or use for energy recovery
Heat Exchanger cleaning waste - Hazardous	Chelant type solution	1,000 gallons	One time event during commissioning	None	Dispose to permitted hazardous waste facility
Spent batteries – Universal Waste	Lead acid, alkaline	20 in 2 years	Intermittent	None. Accumulate onsite for <90 days	Recycle
Construction waste - Nonhazardous	Scrap wood, concrete, steel, glass, plastic, paper	40 cubic yards / week	Intermittent	None	Recycle wherever possible, otherwise dispose to Class III landfill
Sanitary waste - Nonhazardous	Portable chemical toilets – sanitary waste	200 gallons / day	Periodically pumped to tanker truck by licensed contractors	None	Ship to sanitary wastewater treatment plant
Office waste - Nonhazardous	Paper, aluminum, food	1 cy/wk	Intermittent	None	Recycle or dispose to Class III landfill
Operations					
Used Hydraulic Fluid, Oils and Grease – Non-RCRA Hazardous	HTF system, turbine, and other hydraulic equipment	50,000 gallons /year	Intermittent	Accumulated for <90 days	Recycle
Effluent from oily water separation system – Non-RCRA Hazardous	Plant wash down area / oily water separation system	3,000 gallons /year	Intermittent		
Oily rags, oil absorbent, and oil filters – Non RCRA Hazardous	Various	Five 55-gallon drums / month	Intermittent	Accumulated for <90 days	Sent offsite for recovery or disposed at Class I landfill

Waste Stream and Management Method Classification[1]	Origin and Composition	Estimated Amount	Estimated Frequency of Generation	Waste Management Method	
				On-site	Off-site
Soil contaminated with HTF (> Design Levels - RWQCB) – Non RCRA Hazardous	Solar array equipment leaks	10 cubic yards per year	Intermittent	Accumulated of < 90 days	Sent offsite for disposal at a Class I landfill
Soil contaminated with HTF (< Design Levels - RWQCB) – Non RCRA Hazardous	Solar array	750 cubic yards/year	Intermittent	Bioremediation unit	Dispose to waste management facility
Spent batteries – Universal Waste	Rechargeable and household types	<10 / month	Continuous	Accumulate for <1 year	Recycle
Spent batteries – Hazardous	Lead acid	20 every 2 years	Intermittent	Accumulated for <90 days	Recycle
Spent fluorescent tubes – Universal Waste	Facility lighting	< 50 / year	Intermittent	Accumulate for <1 year	Recycle
Spent Demineralizer resin – Nonhazardous	Demineralizer	250 cubic feet	Once every 3 years	None	Recycle
Cooling Tower Blowdown – Designated Liquid Waste	Cooling tower	42,486 gallons /day	Continuous when plant is operating	Evaporation Ponds	None
Cooling Tower Basin Sludge - Nonhazardous	Cooling tower	10 tons/year	Annually	None	Dispose to waste management facility
Spent softener resin - Nonhazardous	Water Softener	500 ft /year	Once every 3 years	None	Recycle
Cooling Tower Solids (Filter Press discharge) – Hazardous	Filter press solids, Dewatered sludge cake	8,937 pounds per day	Continuous	None	Dispose to waste management facility
Sanitary wastewater - Nonhazardous	Toilets, washrooms	2,500 gallons /day	Continuous	Septic leach field	None

[1] Classification under Title 22, CCR § 66261.20 et seq.; Source: 1, Tables 5.16-5, 5.16-6.

VI. ENVIRONMENTAL ASSESSMENT

A. BIOLOGICAL RESOURCES

The Commission must consider the potential impacts of project-related activities on biological resources, including state and federally listed species, species of special concern, wetlands, and other resources of critical biological interest such as unique habitats. The evidence presented by the Staff and the Applicant describes the biological resources in the vicinity of the project site and linear alignments, assesses the potential for adverse impacts, and determines whether mitigation measures are necessary to ensure compliance with applicable laws, ordinances, regulations, and standards (LORS). The evidence was undisputed. (6/28/10 RT 44-45, 49-51, 55, 62, 65-76, 84-94, 7/15/10 RT 7-8, Exs. 1, §5.3, Appendix F; 2; 3; 5; 17; 21; 24; 26; 29; 30; 31; 35; 36; 37; 38; 39; 48, [§ 3.0]; 51; 302, §5.2; 304; 306; 312.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Setting

The AMS project is located in the western Mojave Desert, approximately nine miles northwest of the community of Hinkley and five miles north of State Route (SR) 58, in unincorporated San Bernardino County, California. Surrounding land uses include the existing Harper Lake Solar Electric Generating Stations (SEGS) VIII and IX, located directly northwest of the project area. For the purposes of this analysis, the "project area" covers approximately 1,765 acre and includes the plant site, transmission lines and interconnection substation, drainage channels, access roads, storage areas, and parking zones. (Ex. 1, p. 5.3-1.)

Harper Dry Lake, managed in part by the Bureau of Land Management (BLM), is located directly northeast of the project. South and southeast of the project area is largely undisturbed land, with a few scattered residences. Most of the lands within a 10-mile radius of the project area are designated conservation areas including Desert Wildlife Management Areas (DWMAs), Areas of Critical Environmental Concern (ACECs), Mohave Ground Squirrel (MGS) Conservation Area, and desert tortoise critical habitat. (Exs. 1, pp. 5.3-7 – 5.3-8; 302, p. 5.2-4.)

The project comprises two sites: Alpha (the northwest portion of the project area) and Beta (the southeast portion of the project area), covering approximately 884 and 800 acres, respectively. An additional 81 acres shared

between the plant sites would be utilized for receiving and discharging offsite drainage improvements, for a total of 1,765 acres.

Existing Harper Lake Road runs north to south, bisecting the Alpha solar field and is currently paved, but would be widened during construction. The existing Lockhart Road, which provides access to the Harper Dry Lake Watchable Wildlife Area, divides the proposed Alpha and Beta sites)

The AMS project will use groundwater from existing onsite wells for plant operation. Cooling water blowdown will be piped to onsite evaporation ponds located at both the Alpha and Beta sites.

The construction laydown areas, natural gas pipeline route, and transmission right of way and interconnection facilities are all contained within the project boundary. An existing transmission corridor containing three transmission lines is located at the southern boundary of the AMS site. (Exs. 1, pp. 5.3-1 – 5.3-2, 5.3-7 – 5.3-8; 302, p. 5.2-3 – 5.2-6.)

2. Sensitive Habitat

a. Harper Dry Lake

The Harper Valley Basin is enclosed by the Tehachapi Mountains to the west and the San Gabriel and San Bernardino Mountains to the south. All surrounding areas within the Harper Valley Basin drain into Harper Dry Lake, which is one of the largest dry lake beds in the Mojave Desert. The Harper Dry Lake marsh is restricted to a narrow band along the southwestern shore of Harper Dry Lake. Historically, the Harper Dry Lake marsh comprised three wetland areas: northern, central, and southern. Currently, the central and southern wetlands are the most prolific.

Wetlands such as the Harper Dry Lake marsh are a uniquely important resource in the Mojave Desert for resident wildlife and thousands of migratory birds. Many bird species use the wetlands and surrounding habitat at Harper Dry Lake marsh. In addition to a diverse assemblage of birds, the Harper Lake ACEC provides water, shelter, and foraging habitat for a variety of terrestrial species including coyote, desert kit fox, snakes, and mice.

Several conservation organizations and resource agencies have formally recognized the resource value of the wetlands at Harper Dry Lake, including BLM and the National Audubon Society. In 1982, BLM designated 480 acres,

including 20 acres of wetlands, as an ACEC. In 2003, BLM constructed public viewing facilities within the ACEC to create a Watchable Wildlife Area, which is intended to encourage public interest in the ACEC. BLM also designated Harper Dry Lake as a Key Raptor Area, one of seven such areas in the Mojave Desert. The National Audubon Society designated the Harper Dry Lake marsh as an Important Bird Area because it was one of the most productive wetlands in the Mojave Desert. In addition, preservation and enhancement of the Harper Dry Lake marsh is as important to the long-term conservation of western snowy plover nesting habitat.

The combined effects of groundwater drawdown and cessation of agricultural runoff have seriously degraded the habitat value within the Harper Dry Lake marsh and eliminated the local artesian wells and springs. Because of these adverse effects, groundwater does not exist at a depth that would allow water to collect at the surface through capillary action, which in turn, would allow the wetland to be self-sustaining.

Currently, BLM artificially maintains the central and southern wetlands of the Harper Dry Lake ACEC by pumping groundwater to the wetlands via underground pipes and a surface drainage channel to provide adequate protection to a sensitive and unique wetland habitat which has no independent water supply. The well currently used to pump groundwater to the marsh is located within the Beta solar field. (Exs. 1, p. 5.3-9; 302, pp. 5.2-18 - 5.2-21.)

b. Jurisdictional Wetlands and Waters.

Ephemeral drainages within the Coyote-Cuddeback Lakes Watershed tributary to Harper Dry Lake flow from the adjacent Black Mountains, Rand Mountains, and other perimeter highlands towards the center of the basin at Harper Dry Lake. The majority of the project area has been graded for agricultural uses and is relatively flat with a gentle downward slope (one percent grade) southwest-to-northeast toward Harper Dry Lake. Grading for agricultural operations eliminated any ephemeral washes within the project area. Several relictual ephemeral washes leading to the site are intercepted at the SEGS VIII and IX drainage or abate into dirt roads or the perimeters of agricultural fields. During infrequent large precipitation events, water may reach Harper Dry Lake as sheet flow; however, much of the surface water infiltrates into the sandy alluvium.

As shown below by **Biological Resources Table 1**, 11.03 acres of potentially USACE-jurisdictional waters of the United States occur within the project area along the west shore of Harper Dry Lake. The table also shows that waters of

the state under the jurisdiction of CDFG and the RWQCB comprise 1.47 acres of tamarisk scrub.

Biological Resources Table 1
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]

[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.

(Exs. 1, p. 5.3-9; 302, pp. 5.2-18 - 5.2-21.)

c. Desert Tortoise Critical Habitat

"Desert tortoise 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 project area. The 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. (Exs. 1, p.5.3-7; 302, p. 5.2-21.)

d. Superior-Cronese and Fremont-Kramer Desert Wildlife Management Areas (DWMAs)

DWMAs are designated by BLM under the California Desert Conservation Area (CDCA) plan and are managed with the goal of protecting desert tortoise. The AMS project area does not overlap with any DWMAs. However, the Superior-Cronese and Fremont-Kramer DWMAs are near the project area.

More particularly, the Superior-Cronese DWMA is located north, east and south of the project boundary and Fremont-Kramer is within five miles of the eastern boundary of the project area.

The Superior-Cronese 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. (Exs. 1, p. 5.3-7; 302, pp. 5.2-21 – 5.2-22.)

e. Mohave Ground Squirrel Conservation Area

The West Mojave Plan, administered by BLM, designated a 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 ensuring the long-term viability of the species by controlling off-road vehicle use, grazing, and commercial activities.

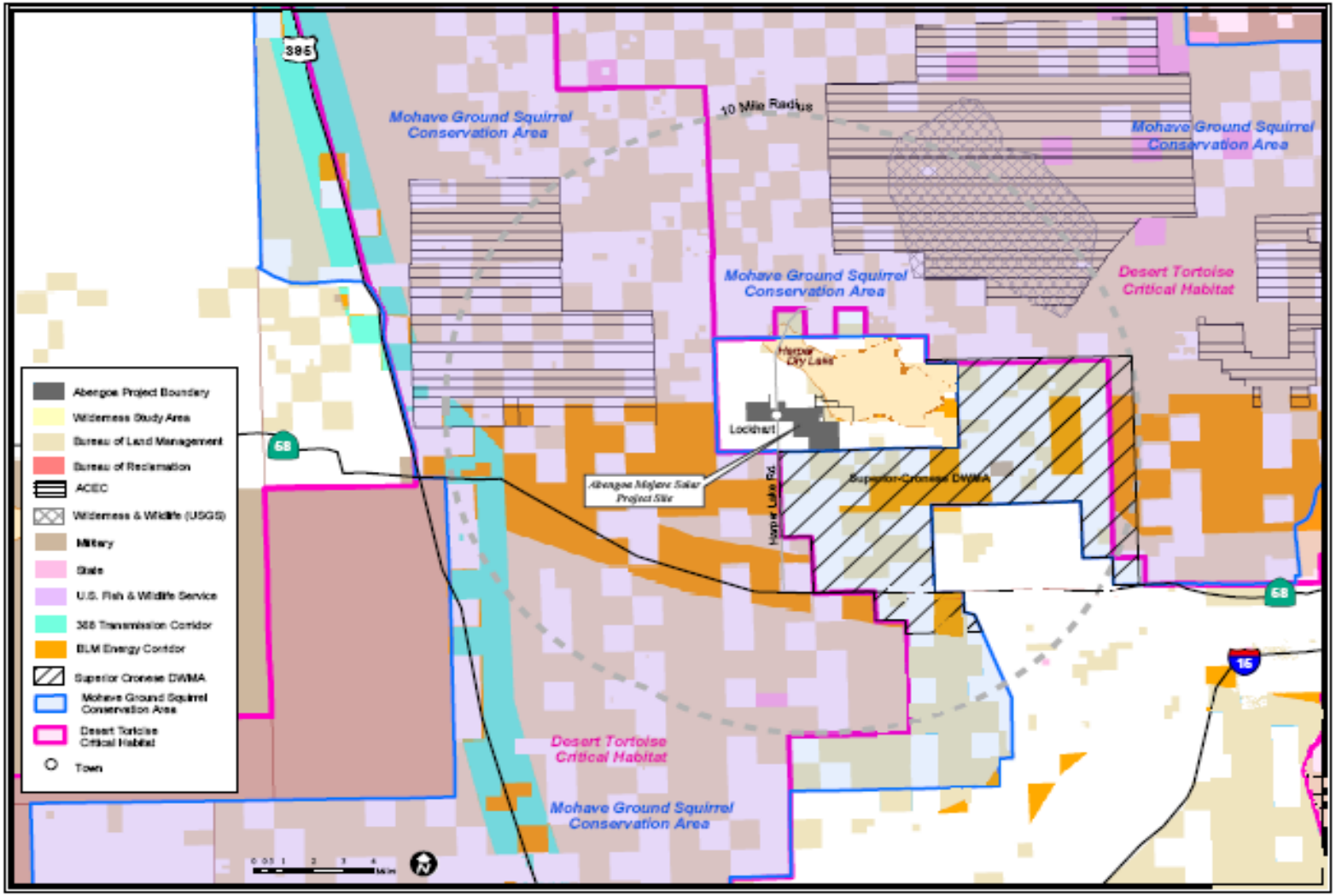
The AMS site and vicinity are not within the MGS Conservation Area. But, as shown in **Biological Resources Figure 1** below, the MGS Conservation Area surrounds the AMS project site. (Exs. 1, p. 5.3-8; 302, pp. 5.2-18 – 5.2-22.)

3. Summary of Vegetation and Wildlife Surveys

The Applicant conducted botanical and wildlife surveys within the project area and surrounding buffer. The details of the studies are provided in the record. In summary, general botanical surveys, which included generating an inventory of all plant species observed and characterizing and mapping vegetation communities, were conducted in 2007, 2008, and 2009 generally between March and July. Surveys for common wildlife species were conducted concurrently with protocol special-status wildlife and general botanical surveys. (Exs. 1, §5.3, 302, pp. 5.2-6 – 5.2-18.)

BIOLOGICAL RESOURCES – FIGURE 1

Abengoa Mojave Solar Project – Harper Dry Lake Land Management Areas and Project Vicinity



Biological Resources Table 2 below identifies the special-status species that were reported to or potentially occur within ten miles of the project area, based on surveys of the project area and vicinity, and searches of the California Natural Diversity Database (CNDDB) and California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants.

Biological Resources Table 2
Special-status Species Potentially Occurring in AMS Project Area

Species	Status*	Habitat	Likelihood of Occurrence in Project Area+
PLANTS			
Barstow woolly sunflower *(Eriophyllum mohavense)*	1B.2	Creosote bush scrub, desert saltbush scrub, playas; blooms April-May	Moderate. Marginal suitable habitat occurs onsite; 11 CNDDB records within five miles; not observed during surveys
Chaparral sand-verbena *(Abronia villosa* var. *aurita)*	1B.1	Chaparral, coastal scrub, and desert dunes or sandy areas; blooms January-September	Low. Marginal habitat occurs adjacent to project area; nearest record is five miles south of project area
Desert cymopterus *(Cymopterus deserticola)*	1B.2	Mojave desert scrub, sandy desert; blooms March- May	Moderate. Marginal habitat occurs onsite; observed 0.75 mile south of project area during surveys; historically robust population recorded immediately south of project area in 1998.
Mojave fish-hook cactus *(Sclerocactus polyancistrus)*	4.2	Mojave desert scrub, Joshua tree woodland, Great Basin scrub; blooms April-July	Moderate. Marginal habitat occurs onsite; observed 0.95 mile south of project area during surveys;
Mojave monkeyflower *(Mimulus mohavensis)*	1B.2	Mojave desert scrub and Joshua tree woodland; blooms April- June	Low. Not known from project area or vicinity; not observed onsite.
Mojave spineflower *(Chorizanthe spinosa)*	4.2	Mojave desert scrub, chenopod scrub, Joshua tree woodland; blooms March- July	Moderate. Marginal habitat occurs onsite; two populations observed 0.8 mile east and west of project area during surveys
Recurved larkspur *(Delpinium recurvatum)*	1B.2	Chenopod scrub, cismontane woodland, and valley/foothill grassland; blooms March- June	Absent. Suitable habitat does not occur onsite or adjacent or project area
Sagebrush loeflingia *(Loeflingia squarrosa* var. *artemisiarum)*	2.2	Desert dunes, great basin scrub, and Sonoran desert scrub; blooms April- May	Absent. Suitable habitat does not occur onsite or adjacent to project area

Species	Status*	Habitat	Likelihood of Occurrence in Project Area+
Utah glasswort *(Sarcocornia utahensis)*	2.2	Chenopod scrub, alkali playas and marshes; blooms August-September	**Moderate.** Suitable habitat occurs in northeast project area; not observed during surveys; recorded along west shore of Harper Lake, north of project area
REPTILES			
Desert tortoise *(Gopherus agassizii)*	FT; ST	Desert scrub and desert washes up to approximately 5,000 feet	**Present.** One live tortoise and several sign observed onsite; higher densities adjacent to project area
BIRDS			
American peregrine falcon *(Falco peregrinus)*	SE (PD), FP	Open habitats, usually adjacent to lakes, rivers, or marshes that support large populations of other bird species. Nests and roosts on protected ledges and high cliffs	**Present.** One individual observed onsite; marsh at Harper Dry Lake provides suitable foraging habitat
American white Pelican *(Pelecanus erythrorhynchos)*	CSC	Fresh water lakes with islands for breeding; inhabits river sloughs, freshwater marshes, estuaries, bays. Nests usually in brackish or freshwater lake islands	**Present.** Carcass observed in survey area; marsh at Harper Dry Lake provides stopover habitat during migration
Burrowing owl *(Athene cunicularia)*	CSC	Sparse grassland, open desert scrub, and agriculture lands; strongly associated with ground squirrel burrows	**Present.** Owls, burrows, and sign were observed onsite during surveys.
Cooper's hawk *(Accipiter cooperi)*	WL	Forages in open woodlands; nests in riparian forest dominated by deciduous species.	**Present.** Observed soaring over project area; nesting habitat does not occur onsite
Golden eagle *(Aquila chrysaetos)*	FP; CSC	Forage in grassy and open shrub habitats; nest primarily on cliffs, secondarily in large trees	**Present.** Suitable foraging habitat occurs throughout project area; pair observed perched on utility pole immediately south or project area during surveys; nesting occurs in Black Mountains 10 miles northeast of project site
LeConte's thrasher *(Toxostoma lecontei)*	CSC	Yearlong residents of desert flats, washes and alluvial fans with sandy and/or alkaline soil and scattered shrubs	**Present.** Observed onsite; suitable foraging and nesting habitat occurs throughout the project area
Loggerhead shrike *(Lanius ludovicianus)*	CSC	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines or other perches	**Present.** Observed onsite; suitable foraging and nesting habitat occurs throughout the project area
Merlin *(Falco columbarius)*	WL	Forages in open grasslands, savannahs, woodlands, near wetlands	**Present.** Observed onsite in fallow agricultural fields

Species	Status*	Habitat	Likelihood of Occurrence in Project Area+
Mountain plover *(Charadrius montanus)*	CSC	Occupies open plains or rolling hills with short grasses or very sparse vegetation; may use newly plowed or sprouting grain fields	Moderate. Suitable wintering habitat occurs onsite; within range of species in San Bernardino County
Northern harrier *(Circus cyanus)*	CSC	Characteristically occurs in marshlands; forages over grasslands. Nests on the ground in thick grass, shrubbery, or other vegetation	Present. Two individuals observed in survey area; marsh at Harper Dry Lake and portions of the project area provide suitable foraging and ground-nesting habitat.
Prairie falcon *(Falco mexicanus)*	WL	Nests in cliffs or escarpments; forages in adjacent dry, open terrain or uplands, marshes	Present. Pair observed soaring and individual observed hunting onsite; suitable nesting habitat does not occur within survey
Short-eared owl *(Asio flammeus)*	CSC	Freshwater marshlands, seasonal wetlands, fallow fields, meadows, and alfalfa fields; needs dense vegetation for nesting (conceal female) and daytime cover	Present. Observed onsite; suitable nesting habitat occurs near active agricultural (alfalfa) field
Swainson's hawk *(Buteo swainsoni)*	ST	Nests in oaks or cottonwoods in or near riparian habitat; forages in grasslands, irrigated pastures and grain fields	Present. Three individuals observed within project area and survey area; project area provides suitable foraging habitat.
Yellow warbler *(Dendroica petechia)*	CSC	Nests in riparian areas dominated by willows, cottonwoods, sycamores, or alders in mature chaparral; may also use oaks, conifers, and urban areas near stream courses	Present. One transient individual was observed onsite; no suitable nesting habitat exists in survey area; marsh at Harper Dry Lake provides stopover habitat during migration
Yuma clapper rail *(Rallus longirostris yumanensis)*	FE; SE; FP	Fresh-water and brackish marshes dominated by cattail or bulrush, mosaic of densely vegetated areas interspersed with shallow open water areas.	Low. Marsh at Harper Dry Lake historically provided nesting habitat for this species; calling birds reported at marsh in 1977 (BLM 2005); retirement of agriculture has subsequently reduced habitat quality in the marsh.
Western snowy plover *(Charadrius alexandrinus nivosus)*	CSC (inland population)	Inland shores of salt ponds and alkali or brackish inland lakes.	Moderate. Marsh at Harper Dry Lake historically provided nesting habitat for this species; 94 birds reported in CNDDB at marsh in 1978; retirement of agriculture has subsequently reduced habitat quality in the marsh.
Willow flycatcher *(Empidonax traillii)*	SE	Riparian habitat dominated by willows or alder and permanent water, often in the form of low gradient watercourses, ponds, lakes, wet meadows, marshes, and seeps within and adjacent to forested landscapes.	Present. One transient individual was observed onsite; no suitable nesting habitat exists in survey area; marsh at Harper Dry Lake provides stopover habitat during migration

Species	Status*	Habitat	Likelihood of Occurrence in Project Area+
MAMMALS			
Desert kit fox (*Vulpes macrotis*)	CCR	Open desert, areas of desert scrub, grasslands, and sandy dunes; sandy and loamy soils	Present. Two dens, and juvenile female road kill observed onsite
Mohave ground squirrel (*Xerospermophilus mohavensis*)	ST	Saltbrush, alkali desert, and creosote bush scrub at elevations from 1,800 to 5,000 feet.	Present. One MGS trapped within the project area; high quality habitat adjacent to project area
Mojave River vole *(Microtus californicus mohavensis)*	CSC	Weedy herbaceous growth in wet areas along the Mojave River.	Low. Marsh at Harper Dry Lake historically provided suitable habitat; reported in ACEC in mid-1980's; retirement of agriculture has subsequently reduced habitat quality in the marsh
American badger *(Taxidea taxus)*	CSC	Open, arid habitats, grasslands, savannas, mountain meadows, and open areas of desert scrub.	High. One den observed during reconnaissance surveys.

*Status Legend (Federal/State/California Native Plant Society (CNPS) lists, CNPS list is for plants only):
FE = Federally listed Endangered; FT = Federally listed Threatened; FC = Candidate Species for Listing; SE = State-listed Endangered; ST = State-listed Threatened; CSC = California Species of Concern; FP = Fully Protected; SR = State Rare; WL = State Watch List; PD = proposed for Delisting; CCR = protected under CDFG Code Title 14, CCR §460; List 1B = Rare or Endangered in California and elsewhere; List 2 = Rare, threatened, or endangered in California but more common elsewhere; List 4 = Limited distribution – a watch list; .1 = Seriously threatened in California (high degree/immediacy of threat); .2 = Fairly threatened in California (moderate degree/immediacy of threat) (Sources: CDFG 2009; CNPS 2009; AS 2009a).

+Definitions Regarding Potential Occurrence:
Present: Species or sign of its presence observed onsite
High: Species or sign not observed on the site, but reasonably certain to occur onsite
Moderate: Species or sign not observed on the site, but conditions suitable for occurrence
Low: Species or sign not observed on the site, conditions marginal for occurrence
Absent: Species or sign not observed on the site, conditions unsuitable for occurrence

The results of the protocol surveys conducted for desert tortoise, burrowing owl, Mohave ground squirrel (MGS), and raptors are summarized below. Focused surveys for Swainson's hawk and golden eagle are in progress.

a. Desert Tortoise

In the Mojave Desert, desert tortoise is commonly found in association with creosote bush, Joshua tree woodland, and saltbush scrub. The region encompassing Harper Dry Lake and the project area historically and recently have supported moderate densities of tortoise.

Native vegetation surrounding the AMS site, including desert saltbush scrub, Mojave creosote bush scrub, and Mojave desert wash scrub, provide higher quality desert tortoise habitat than the AMS site. But, the AMS project area,

particularly the eastern portion, includes disturbed areas that are re-establishing native vegetation that provides suitable habitat for tortoise.

The evidence shows that reconnaissance surveys for desert tortoise and areas of suitable habitat were conducted in 2006. It further shows that protocol-level surveys were conducted in 2007, 2008, and 2009 between April and May, extending into early June with permission from U.S. Fish and Wildlife Service (USFWS). Even though the Applicant reconfigured the project boundary several times; the surveys ultimately covered the entire project site and a buffer as follows:

- **2006.** The 2006 project area encompassed the entire Beta site, as currently proposed, and the south and west portions of Section 29 within the Alpha site. This previous project area is approximately 515 acres less than the current proposed project area and included a 0.1 square mile area in the northwest portion of Section 29 that has been eliminated from the current proposed project area. Reconnaissance surveys conducted in 2006 covered approximately 1,250 acres within the previous project area plus a one mile buffer surrounding the site.
- **2007.** The 2007 project area was the same as described for 2006. Protocol surveys conducted in 2007 covered approximately 1,250 acres within the previous project area plus a one mile buffer surrounding the site.
- **2008.** The 2008 project area is very similar to the current proposed project area except in the 2008 project area, a 0.1 square mile section within the northwest portion of Section 29 was removed and a 0.1 square mile section within the northeast corner of Section 5 was added to the southern boundary of the Beta site.

  Protocol surveys conducted in 2008 covered the largest area, encompassing the entire current proposed project area plus an additional 3,146 acres surrounding the proposed project area.
- **2009.** The 2009 project area is the current proposed project area and protocol surveys of certain areas of suitable habitat identified by CDFG were conducted in 2009. These areas totaled approximately 660 acres and did not include Zone of Influence transects, with concurrence by USFWS. A Zone of Influence is defined as the area where desert tortoise on adjacent lands may be directly or indirectly affected by project development. (Exs. 1, §5.3.4.2.3, 302, p. 5.2-11.)

Survey results are presented below in **Biological Resources Table 3.** As shown, relatively high concentrations of live tortoise and tortoise sign were documented immediately east and west of the project area. Only one live tortoise was observed within the project area. The evidence indicates that this was an incidental observation during Mohave ground squirrel surveys in 2006.

Biological Resources Table 3
Desert Tortoise Survey Results

Survey Year	Live Tortoise Observed	Tortoise Sign Observed
Proposed Project Area[1]		
2006 (reconnaissance, not protocol)	1 adult female	1 scat
2007	0	7 carcass; 1 burrow
2008	0	5 carcass
2009	0	5 carcass; 1 burrow; 3 scat; 3 other
Zone of Influence Transects[2]		
2007	1 adult male	1 carcass; 2 burrow; 14 scat
2008	41 (33 adults, 6 sub-adults, 2 juveniles)	86 carcasses; 220 burrows; 654 scat; 118 other

[1]Project area boundaries as proposed in AFC (AS 2009a).
[2] Surveys using Zone of Influence transects were conducted in 2007 and 2008 only.

b. Western Burrowing Owl

The Western burrowing owl is a yearlong resident of open, dry grassland, prairie, and desert floor habitats, and is also known to occur in urban, disturbed areas and at the edges of agricultural fields.

Reconnaissance surveys of the project area in 2006 identified four burrowing owls. The evidence further establishes that burrowing owl protocol surveys were subsequently conducted during summer 2007 and spring 2008. All four phases of the surveys were completed, as required by the protocol.

The protocol surveys conducted in 2007 did not cover the project area as currently proposed; specifically the one-square mile portion west of Harper Lake Road had not been identified and was therefore excluded from site surveys. However, surveys within the one-mile buffer of the 2007 site allowed for coverage of this western portion of the project area. In total for 2007, six burrows, three burrows with recent owl sign (e.g., white-wash, pellets), one roost, and one owl were observed within the AMS project area.

Additionally, three owls, nine burrows, and six burrows with recent owl sign were documented outside of the project area, but within the one-mile survey buffer.

Protocol surveys conducted in 2008 covered the largest area, encompassing the entire project area. One burrowing owl and one instance of burrowing owl sign were observed within the project area. Outside of the project area, but within the survey buffer, one owl, 20 burrows with recent owl sign, and four instances of owl sign were documented. The highest concentrations of burrowing owls and sign were recorded in the undisturbed desert scrub habitat east and west of the project boundaries. (Exs. 1, § 5.3.4.2.3, Appendixes F.1, F.2, 302, p.5.2-13.)

c. Mohave Ground Squirrel

The Mohave ground squirrel (MGS) is state-listed as threatened and the USFWS is currently reviewing a petition to list the species as endangered under the federal Endangered Species Act (ESA). MGS is limited to the western Mojave Desert; with a range that encompasses the project area.

MGS is found in a variety of habitats including desert saltbush scrub and creosote bush scrub, which occur adjacent to the project area and which are beginning to re-colonize fallow and disturbed areas within the project site.

Protocol surveys were conducted in 2006[30]. No MGS were observed in visual surveys or captured in trapping efforts. When surveys were repeated in 2007 within the same project footprint (but a different grid configuration), MGS was not observed during visual surveys. However, one adult female was trapped south of the active alfalfa field, immediately adjacent to, but outside of, the project area. Protocol surveys were not conducted within the project area west of Harper Lake Road. Because MGS are notoriously difficult to capture, trapping surveys do not provide a definitive quantification of the number of individuals that may be onsite.

A subsequent MGS habitat assessment determined that the native vegetation east (undisturbed creosote scrub) and west (undisturbed desert saltbush scrub and creosote scrub) of the project area provides high quality suitable habitat for MGS. Disturbed habitat within the project area does not provide food resources to support a substantial permanent MGS population; but, transient MGS may be occasionally present in the project area as they move between areas of suitable habitat. (Exs. 1, § 5.3.4, Appendix F.1, 302, pp. 5.2-12 - 5.2-13.)

[30] These surveys were conducted for the proposed Harper Lake Dairy Park, which covered a large portion of the current proposed project area, excluding the portion west of Harper Lake Road. The AMS project encompasses the area originally proposed for the Harper Lake Dairy Park.

d. Raptors

Raptor surveys, with emphasis on detection of northern harrier, prairie falcon, peregrine falcon, Swainson's hawk, and short-eared owl were conducted during spring and winter 2007. As with MGS and burrowing owl surveys, the entire AMS project area as currently proposed had not been identified in 2007. As a result, the one-square mile portion west of Harper Lake Road was excluded from site surveys. Surveys within the one-mile buffer of the 2007 site ultimately allowed for coverage of this western portion of the project area.

Species observed during focused raptor surveys include American kestrel, Swainson's hawk, turkey vulture, northern harrier, Cooper's hawk, Red-tailed hawk, golden eagle, merlin, prairie falcon, and great horned owl as well as common raven. Other special status-bird species observed during reconnaissance and other focused surveys are noted in **Biological Resources Table 2** above. The Applicant will be conducting focused Swainson's hawk surveys between April and July 2010. (Exs. 1, p.5.3-16, Appendix F.1, 302, pp. 5.2-13 – 5.2-14.)

e. Golden Eagle

Golden eagles are typically year-round residents throughout most of their western United States range. They require open terrain for hunting and prefer grasslands, deserts, savanna, and early successional stages of forest and shrub habitats. This species prefers to nest in rugged, open habitats with canyons and escarpments, with overhanging ledges and cliffs and large trees for cover.

An Environmental Assessment (EA) and Implementation Guidance for take permits were issued to the Applicant under the Bald and Golden Eagle Protection Act. Pursuant to EA specifications, the Applicant is currently conducting inventory surveys for nesting golden eagles according to USFWS protocol. The protocol recommends two surveys separated by a minimum of 30 days. Results of the first survey conducted in late April 2010 found two golden eagle nests (one active and one inactive) approximately 10.2 miles northeast of the project site at Black Mountain. In addition, a pair of golden eagles was observed perched on a utility pole immediately south of the project site during raptor surveys in 2007 and two historic nests occur within 4.1 miles (active in 1977) and 8.3 miles (active in 1965) of the project site. Non-breeding season surveys will be conducted in late 2010.

Given the presence of golden eagles within 10 miles of the project area, it is expected that this species forages within the disturbed and active agricultural land within the project area. However, suitable nesting substrate (i.e., cliff ledges, rocky outcrops, or large trees), does not occur within or immediately adjacent to the project area. Instead, the nearest suitable nesting habitat is approximately 4.0 miles west of the AMS project. (Ex. 302, p. 5.2-14.)

4. Habitat-Related Construction Impacts and Mitigation

The evidence regarding species-specific impacts and proposed avoidance, minimization, and mitigation measures is summarized below.

a. Special-Status Plants

No special-status plants were observed within the project area during focused botanical surveys conducted by the Applicant in 2007, 2008, and 2009 or focused surveys conducted by Staff in April 2010. Moreover, the potential for special-status plants to occur within the project area is low given the disturbed nature of existing habitats.

However, three CNPS-listed plants were detected within 4,000 to 4,975 feet of the project area during surveys: desert cymopterus, Mojave fish-hook cactus, and Mojave spineflowe. These and other special-status plants adjacent to the 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 specified by Condition of Certification **BIO-7**, will avoid direct impacts to the off-site special-status plants.

Wind-blown dust from construction activities might indirectly affect rare plant populations adjacent to the AMS project area. Wind-borne transport of dust and sand can result in the degradation of soil and vegetation over a wide area and can result in impacts such as killing plants by burial and abrasion, interrupting natural processes of nutrient accumulation, and loss of soil resources. Dust abatement, as described in Conditions of Certification **AQ-SC3** and **AQ-SC4** will minimize these impacts to less than significant levels.

b. General Vegetation

Biological Resources Table 4 below identifies the vegetation communities and corresponding acreages occurring the AMS project area that would be subject to direct and permanent impacts within the project footprint. This vegetation includes disturbed native plant communities as well as active and fallow agriculture, with marginal habitat value for special-status species.

Biological Resources Table 4
Vegetation Communities and Acreages Occurring in AMS Project Area

Vegetation Communities	Acres
Fallow Agricultural – Ruderal	832.7
Disturbed	256.1
Disturbed - Saltbush Scrub Re-growth	226.0
Fallow Agricultural – Saltbush Scrub Re-growth	202.9
Active Agricultural	128.0
Developed	66.6
Desert Sink Scrub	39.6
Tamarisk Scrub	13.2
Unvegetated Dry Lake Bed	9.3
Disturbed – Desert Saltbush Scrub	1.1
Desert Saltbush Scrub	0.6
Total Acreage	**1,776.1**[1]

[1] The total acreage for all vegetation communities and other cover types within the Project Area is slightly different than the area calculated during the AMS land survey performed by engineers. The variation in acreage is attributed to a difference in equipment used for determining acreage of the project area (i.e., land survey versus GIS processing). Acreages in **Table 2** are the habitat acreages from which habitat compensation is based.

The evidence shows that construction of the AMS project would not result in substantial loss of native vegetation or a regionally unique habitat type within the project area. However, the undisturbed creosote bush scrub and Mojave Desert wash scrub surrounding the project area could be adversely impacted by construction activities absent implementation of Condition of Certification **BIO-7**, which requires the boundaries of all permanent disturbance areas to be delineated and all work, vehicles, and equipment to be confined to these areas. Implementation of this condition will ensure that impacts to general vegetation would be less than significant.

c. Migratory/Special-Status Birds

The majority of the project area is devoid of trees but there are scattered tamarisk trees, along the western edge of Harper Lake and along some roadsides adjacent to agricultural fields. These trees provide suitable nesting

substrate for a variety of birds. Suitable nesting habitat is also available within the project area's desert saltbush scrub and Mojave creosote bush scrub.

The following special-status birds are likely to both breed *and* forage at the project site: Northern harrier, short-eared owl, loggerhead shrike, LeConte's thrasher, and California horned lark. The Western burrowing owl is known to nest and forage within the project area[31] (Exs., 302, pp. 5.2-15 – 5.2-26, 5.2-30 – 5.2-31.)

Construction activities during the nesting season (February through September) could adversely affect breeding birds through direct take or indirectly through disruption or harassment, which could result in nest failure or abandonment. We have therefore adopted Condition of Certification **BIO-8**, which requires the project owner to perform, among other activities, pre-construction nest surveys if construction activities will occur from February 1 through August 1. The designated Biologist or Biological Monitor (see Conditions of Certification **BIO-1** – **BIO-4**) must perform the surveys in accordance with the guidelines set forth in **BIO-8**. With implementation of **BIO-8**, construction activities will not result in significant impacts to nesting birds. Implementation of these measures will also mitigate any potential impacts to common bird species adapted to disturbed and transitional environments that are expected to nest in equipment or other available substrate within and surrounding the proposed project area.

Specifically with respect to the western burrowing owl, construction impacts include displacement of individuals or pairs, increased predation risk, 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 1,704 acres of suitable foraging habitat, including fallow and active agricultural areas and scrub habitat. Without mitigation these potential impacts to burrowing owls are significant. (Ex. 302, pp. 5.2-30 – 5.2-31.)

Direct and indirect impacts to burrowing owl resulting from construction of the AMS project would be mitigated to less than significant levels with implementation of Conditions of Certification **BIO-13** and **BIO-15**. **BIO-13**

[31] Although focused surveys for nesting Swainson's hawk are not completed, the evidence establishes that 95 percent of the California population of this species is found within the Central Valley and there are no known breeding pairs east of Palm Springs. Therefore, it is unlikely that nesting Swainson's hawks occur in the vicinity of the AMS project area

requires the project owner to develop a Burrowing Owl Monitoring and Mitigation Plan in consultation with the Commission Compliance Project Manager (CPM) and CDFG before performing the required preconstruction surveys. **BIO-15** requires the project owner to mitigate for habitat loss and incidental take of the burrowing owl (and MGS and desert tortoise) by acquiring no less than 118.2 acres of land suitable for this species and providing funding for the enhancement and long-term management of these compensation lands.

The evidence also identifies special-status birds that forage within the AMS site, but are not known to breed within the site that will be impacted by the loss of approximately 1,704 acres of suitable foraging habitat. They are Swainson's hawk, golden eagle, American peregrine falcon, Cooper's hawk, Merlin, and prairie falcon. (Ex. 302, p. 5.2-25 – 5.2-27.)

Although Swainson's hawk is adapting to the conversion of natural habitat throughout the Central Valley by foraging within agricultural lands, it does not rely exclusively on agricultural lands for foraging. In desert a habitat, Swainson's hawk eats animals such as reptiles and other small birds.

While the evidence establishes that the loss of foraging habitat for Swainson's hawk, golden eagle, American peregrine falcon, Cooper's hawk, Merlin, and prairie falcon is an adverse impact, we find that that impact is less than significant and does not require mitigation. (Ex. 302, p. 5.2-26.)

In contrast, the uncertainties regarding golden eagle nesting territory near the project site require the possible implementation of mitigation measures. The evidence shows that suitable nesting substrate (i.e., cliff ledges, rocky outcrops, or large trees), does not occur within or immediately adjacent to the proposed project area. Instead, the nearest suitable nesting habitat is approximately 4.0 miles west of the proposed project. (Ex. 302, p. 5.2-14.) Based on the evidence, it is unlikely that yet unidentified golden eagles would be nesting close enough to the proposed project area to be disturbed by construction or operation activities.

If future surveys reveal active nesting territory closer to the project site than Black Mountain, the Applicant must develop and implement a Golden Eagle Territory-Specific Management Plan to avoid and minimize disturbance to eagles. In this event, implementation of Condition of Certification **BIO-9**, which was developed in coordination with USFWS, will reduce impacts to nesting golden eagles to less-than-significant levels. Compliance with **BIO-9** will also ensure that the project is in compliance with CDFG's provision for no take of this Fully Protected

species under Section 3511 of California Fish and Game Code. (Ex. 302, pp. 5.2-26 – 5.2-27.)

d. Desert Tortoise

As shown in **Biological Resources Table 2** above, the protocol surveys 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.

Furthermore, although the majority of the 1,765-acre proposed project area is disturbed and lacks suitable forage and burrow sites for desert tortoise, transient individuals could occur within the portions of the site that support disturbed fallow saltbush scrub and desert wash scrub. These tortoises are likely to access this habitat from the Mojave creosote bush scrub and desert saltbush scrub to the east, south, and west of the AMS site.

The evidence indicates that the desert tortoise near the project area are susceptible to direct mortality, injury, or harassment resulting from encounters with construction vehicles or heavy equipment. Death or injury might also occur to tortoises that take shelter under parked vehicles when those vehicles are moved. They could also be crushed or entombed in their burrows during site grading or other ground disturbing activities. The tortoise's attraction to pooled water in the construction area from the uses of water for dust control, puts 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.

The evidence also indicates that increased human activity in tortoise-occupied areas and excessive noise or vibration from the heavy equipment would disrupt breeding and foraging behavior.

Without mitigation, the above-described impacts are significant. We have therefore adopted Condition of Certification **BIO-7**, which requires the project owner to implement several measures to manage the project site and related facilities in a manner that will avoid or minimize impacts to biological resources.

We have also adopted Condition of Certification **BIO-11**, which requires the project manager to develop a Desert Tortoise Exclusion Fencing, Clearance Surveys, and Translocation Plan in consultation with the Commission Compliance Program Manager (CPM), CDFG, and USFWS. The evidence

establishes that the project's installation of tortoise-proof exclusion fencing and gates to keep desert tortoise out of construction areas, together with performance of comprehensive clearance surveys and translocation of any individual tortoises in the project area would ensure that there are no tortoise in the project area prior to construction activities.

While we recognize the potential for connectivity impacts due to the exclusion fence at the perimeter of the plant site, the evidence is inconclusive regarding the current contact between the populations on the east and west sides of the proposed project and local connectivity is essential to the continued persistence of the tortoise populations within the Superior-Cronese DWMA and the Western Mojave Recovery Unit. We therefore conclude that although impacts to population connectivity would be adverse if there were significant impacts, the evidence presented shows that the impacts would be less than significant.

In contrast, the expected loss of 430 acres of desert tortoise habitat will be significant and requires mitigation. The evidence establishes that mitigation can be achieved through preservation and enhancement of compensatory habitat. Condition of Certification **BIO-15** consequently requires the project owner to mitigate for habitat loss and incidental take of the desert tortoise by acquiring no less than 118.2 acres of land suitable for these species and by providing funding for the enhancement and long-term management of the compensation lands. (Ex. 302, pp. 5.2-27 – 5.2-29.)

e. Mohave Ground Squirrel

The majority of the project area lacks suitable habitat to support a substantial resident MGS population but a MGS habitat assessment determined that the native vegetation east and west of the project area (undisturbed creosote scrub to the east and (undisturbed desert saltbush to the west) provides high quality suitable habitat for MGS. Therefore transient MGS may occur on the AMS site.

The evidence shows that 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. For instance, MGS moving through the project area or across access roads between patches of adjacent suitable habitat may be struck by construction vehicles of equipment. Similarly, nearby MGS that might establish within the project area in patches of suitable habitat in advance of construction activities could be crushed or entombed in their burrow by site grading or other ground disturbing activities.

MGS near the project boundary may be disturbed or harassed by ground vibration and noise as well as human presence during construction. These disturbances 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. Furthermore, the direct impacts to MGS within the project area would be avoided and minimized to the extent possible by efforts to trap and relocate any individuals within the exclusion fence surrounding the project area. We note, however, that exclusion or relocation of MGS is difficult because this species is difficult to trap and can easily burrow under or climb over exclusion fencing.

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 relocation measures are detailed in Condition of Certification **BIO-12**.

In addition, the general impact avoidance and minimization measures described in Condition of Certification **BIO-7** would require monitoring during vegetation removal and grading activities and removal of any MGS attractants such as human food and trash from the project area, thereby further reducing the potential for adverse impacts to MGS.

With respect to connectivity, the AMS project is located between the Edwards Air Force Base core MGS population and Coolgardie Mesa-Superior Valley core MGS population. These populations are separated by approximately 25 to 30 miles. While ensuring sufficient connectivity to allow gene flow between core populations is an important conservation goal, the evidence establishes that development of the proposed project is not expected to constrain regional MGS population connectivity because there is no wildlife movement corridor across the Harper Valley area between the Edwards Air Force Base and Coolgardie Mesa-Superior Valley core populations. Thus, we find that the potential impacts to population connectivity are less than significant.

However, the loss of approximately 430 acres of marginal MGS habitat on the AMS site is significant and requires 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. This mitigation would be achieved through preservation and enhancement of compensatory habitat as described above regarding the desert tortoise. As discussed above, Condition of Certification **BIO-15** requires the project owner to mitigate for habitat loss and incidental take of the desert tortoise, by acquiring no less than 118.2 acres of land suitable for these species and by providing funding for the enhancement and long-term management of the these compensation lands. (Ex. 302, pp. 5.2-29 – 5.2-30.)

f. American Badger and Desert Kit Fox

One American badger den and two desert kit fox dens were observed within the proposed project area. Construction activities such as site grading and heavy equipment operation could kill or injure these species if they come into contact with construction equipment or if they are entombed in their dens. 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, we have adopted Condition of Certification **BIO-14,** which requires a qualified biologist to perform a preconstruction survey for badger and kit fox dens in the project area and a 250-foot buffer. Outside of the February 1 to September 30 whelping season, individuals would be excluded from dens and the dens confirmed as vacant 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 to less than significant levels. (Ex. 302, pp. 5.2-31 -5.2-32.)

5. General Construction Impacts and Mitigation

Construction activities, including noise and lighting impacts have the potential to create a variety of temporary impacts to biological resources. In addition, construction activities can spread noxious weeds in areas adjacent to the AMS site. The evidence regarding these general construction impacts is summarized below.

a. Construction Traffic.

Roads and highways are ever-present landscape features that have a variety of direct and indirect effects on surrounding wildlife populations, including desert tortoise. Direct effects include road mortality and indirect effects include habitat fragmentation, proliferation of non-native and predatory species. Even though the AMS project does not require construction of a new road, site access by construction personnel and equipment will increase existing traffic levels along Harper Lake Road between State Route 58 and the AMS site.

As discussed above, the majority of Harper Lake Road has desert tortoise exclusion fencing. The unfenced portions allow tortoise and other wildlife to move access Harper Lake Road but as a result, of increased traffic they might be forced to travel along the road, unable to cross the fence at the other side. These animals are especially vulnerable to vehicle collisions. We therefore find that increased mortality of desert tortoise and other special-status wildlife due to collisions with project vehicles is a significant impact that required mitigation.

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 imposed by and described in Conditions of Certification **BIO-5** and **BIO-7**. Implementation of these conditions will reduce traffic impacts to less than significant levels

b. Noise

The majority of construction activities is expected to take place between 7:00 a.m. and 6:00 p.m. 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 Edwards Air Force Base already 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 project site, is an especially sensitive noise receptor due to the presence of breeding birds. The evidence establishes that noise levels over 60 A-weighted decibels (dBA) can result in nest abandonment. Moreover, intense and long-lasting noise can mask

bird calls which can reduce reproductive success. Using 60 dBA as a reference point for evaluating noise impacts on wildlife, Staff determined that noise levels from the project area to the nearest biologically sensitive receptor (Harper Dry Lake marsh) would generally range from 54 dBA to 60 dBA. However, the 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 result in higher noise levels than the Applicant's projected level of 59 dBA and might even exceed the 60 dBA significance threshold for noise impacts to wildlife.

To minimize noise impacts to breeding birds at the marsh we have adopted Condition of Certification **BIO-8**, 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. (Ex. 302, p. 5.2-36.)

c. Lighting

Construction activities might occur at night outside of the expected work hours to maintain schedule. Bright lighting at night could disturb the nesting, foraging, or mating activities of wildlife and make wildlife (especially nocturnal wildlife) more visible to predators. Night lighting could be disorienting to migratory birds and, if placed on tall structures, may increase the likelihood of collision.

The evidence shows that lighting impacts will be temporary. Moreover, with implementation of Conditions of Certification **BIO-7** and **BIO-14**, the impacts would be less than significant. Nocturnal mammals would be excluded from the project area prior to construction as described in Condition of Certification **BIO-14**. And, 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 also requires that side-cast light not be directed at the edges of the project boundary or the Harper Dry Lake marsh. (Ex. 302, p. 5.2-37.)

d. 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 such as increased fire frequency by providing sufficient fuel to carry fires, especially in the inter-shrub spaces that are mostly devoid of native vegetation as well as decreased quality and quantity of plant foods available to desert tortoises and other herbivores.

The entire AMS site would be permanently disturbed and graded to eliminate existing vegetation and level the site. Construction activities and soil disturbance would facilitate 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 including Saharan mustard and split grass.

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. (Ex. 302. pp. 5.2-35 -5.2-37.)

e. Jurisdictional Waters

As previously discussed, 11.03 acres of the project area meet the parameters required for designation as potential waters of the United States. (Ex. 302, pp 5.2, 30,. 5.2-35.) The USACE has determined however that all aquatic features occurring within the proposed project area are isolated and not under their jurisdiction. As a result, the AMS project is not required to obtain a permit under Section 404 of the Clean Water Act. (Ex. 302, p. 5.2-35.)

Impacts to approximately 10.76 acres of these 11.03 acres will be avoided by the project owner establishing a construction exclusion zone within which no equipment or personnel would enter and no work would be conducted. The remaining 0.27 acres would be removed during construction. (*Id*.)

The project's construction of the drainage channel outlet at Harper Dry Lake, will result in removal of 1.47 acres of tamarisk scrub. Notably, direct impacts to tamarisk do not require mitigation. Rather, removal of tamarisk is 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.

Nonetheless, to ensure effective eradication of tamarisk scrub, we have adopted Condition of Certification **BIO-16**, which requires monitoring and reporting over a five year period consistent with CDFG requirements. (Exs. 1, p. 5.3-39, 302, pp. 5.2-35 – 5.2-36.)

Neither CDFG nor RWQCB typically exert jurisdiction over monotypic stands of tamarisk scrub because it is an invasive species with little habitat value. Thus, impacts to waters of the state would be less than significant and no mitigation is proposed.

6. Operation Impacts and Mitigation

Potential operation-related impacts and mitigation are summarized below.

a. Avian Collision and Electrocution

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** tall transmission line support structures approximately 80 to 100-feet-high. 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.

b. 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. 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). 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.

Marsh habitat at Harper Dry Lake adjacent to the project attracts resident and migratory birds and is reported to support thousands of birds during the spring months.

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; bird mortality is significantly lower at towers shorter than 350 feet. 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, 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. 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 and suffer resulting 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. However, there is no research-based data to support a finding that the impacts are significant. In light of the evidence presented on the likely potential for impacts, we have adopted Condition of Certification **BIO-17**, which requires the project owner to prepare and implement a Bird Monitoring Study to monitor death and injury from bird collisions with facility features. (Ex. 302, pp. 5.2-38 - 5.2-39.)

c. 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.

According to the evidence, most bird electrocutions are caused by lines that are energized at voltage levels between 1-kV and 60-kV. 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.

The proposed AMS 230-kV transmission lines are not likely to result in bird electrocutions. To further reduce potential electrocution impacts, Condition of Certification **BIO-7** requires the project owner to design, install, and maintain all transmission lines and electrical component in accordance with the Avian Power Line Interaction Committee's *Suggested Practices for Avian Protection on Power Lines* and *Mitigating Bird Collisions with Power Lines.* (Ex. 302, p. 5.2-39.)

d. Lighting and Glare

The proposed solar mirrors and heat collection elements (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.

The illuminated receiver tubes would be visible to an observer who is not looking directly at the mirrors' axis or center, but this illumination would be much less than that of the sun.

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, wildlife on the ground at a distance of 20 meters or closer to the site's 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.

We thus find that with implementation of 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, glare exposure to wildlife on the

ground would be prevented and potential impacts would be reduced to less than significant levels. (Ex. 302, pp. 5.2-39 – 5.2-40.)

e. Noise

As more fully discussed in the **NOISE** section of this Decision, cumulative operational noise levels are not expected to increase above existing ambient conditions, which is approximately 42 to 52 dBA. As a result, we find that there would be no significant impacts to biological resources by increased operational noise and therefore no mitigation is required. (Ex. 302, p. 5,2-40.)

f. Stormwater Drainage Channels

The proposed stormwater drainage channels present a serious entrapment hazard to desert tortoise and other wildlife. 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. Injury is also likely from entanglement in the gabion mattress and energy dissipation materials as well as any debris within the drainage channels.

To avoid injury and mortality to wildlife, the project is required to reinforce exclusion fencing around the drainage channels, particularly at the headwalls, outlet, and road crossings and to monitor the fencing for breaches or disrepair. Implementation of these requirements as set forth in Condition of Certification **BIO-11** would avoid and minimize impacts to desert tortoise to less than significant levels.

g. Raven Predation

The common raven is the most highly visible predator of juvenile desert tortoises. Predation pressure by ravens is increased through elevated raven populations as a result of resource subsidies associated with human activities as 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.

Transmission lines and support structures as well as other infrastructure provide perching and nesting opportunities for ravens. 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.

Eliminating or decreasing raven subsidies would discourage their residence and proliferation at the project area and thereby reduce the risk of predation on juvenile tortoises. This risk reduction will be accomplished through implementation of Conditions of Certification **BIO-7** and **BIO-18**. **BIO-7** requires trash control and disposal offsite as well as requiring minimal water application and monitoring to ensure water does not puddle. **BIO-18** requires implementation of measures including designing and implementing a common raven monitoring, management, and control plan. This condition also requires the project owner to make payment to an account already established with the National Fish and Wildlife Foundation (NFWF) under a Memorandum of Agreement between the Renewable Energy Action Team agencies to implement the regional raven management plan. (Ex. 302, pp. 5.2-41 – 5.2-42.)

h. Traffic

Operation of the AMS project would generate a maximum of 250 trips per day thereby resulting in an increase in traffic along Harper Lake Road. (Exs. 1, p. 5.13-23) The direct impacts to wildlife will be the same for operational traffic as described for construction traffic, above.

Implementation of Conditions of Certification **BIO-5 and BIO-7**, as discussed above regarding construction activities, will reduce impacts to special-status wildlife from operation traffic to less than significant levels. **BIO-5** requires environmental awareness training for workers and **BIO-7**, 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.

i. Evaporation Ponds

A variety of waterfowl and shorebirds seasonally inhabit or use evaporation ponds as resting, foraging, and nesting areas. The AMS 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.

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.

Condition of Certification **BIO-19**, requires the project owner to develop and implement an Evaporation Pond Monitoring and Adaptive Management Plan that meets the requirements of the USFWS, CDFG, RWQCB, and the CPM. Evaporation pond monitoring and reporting must continue for the life of the project. Implementation of effective exclusion/deterrent technologies as demonstrated by routine monitoring, and adaptive management strategies will reduce evaporation pond impacts to birds and other wildlife to less-than-significant levels.

7. 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 potential impacts are discussed in the **SOIL AND WATER RESOURCES** section of this Decision.

Specifically with respect to biological resources, the evidence shows that the well currently used to pump groundwater to the marsh is located within the proposed Beta solar field. This well would be decommissioned approximately six months after the initiation of project construction. The Applicant has asserted that the existing well on BLM property will be retrofitted and deepened to serve the marsh in lieu of the well on the Beta field.

Significant impacts to the marsh and the biological resources therein could occur if groundwater transfers to the marsh were suspended due to a delay between well decommissioning and retrofitting. To avoid this potentially significant impact, we adopted Condition of Certification **BIO-20,** which requires that a well capable of providing at least 75 acre feet per year of water to the marsh be in service prior to decommissioning the well on the Beta field.

8. Cumulative Impacts

Under CEQA Guidelines, "a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts" [Title 14 Cal Code Regs §15130(a)(1)]. Cumulative impacts must be addressed if the incremental effect of a project, combined with the effects of other projects is "cumulatively considerable." [Title 14 Cal Code Regs §15130(a)]. Such incremental effects are to be "viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." [Title 14 Cal Code Regs §15164(b)(1).] Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis. NEPA states that cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR §1508.7). Under NEPA, both context and intensity are considered. When considering intensity of an effect, we consider "whether the action is related to other actions with individually minor but cumulatively significant impacts. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts." [40 CFR §1508.27(b)(7)].

The record details the existing cumulative conditions in the region and also provides a general history of development in California's southern deserts.
(Exs. 1,§5.3, 300, §4-1, 302, pp. 5.2-46 – 5.2-50.)

Because the AMS project would develop 1,765 acres of land, including more than 1,260 acres of this early successional scrub habitat and establish 20 acres of evaporation ponds, it will contribute to the loss of habitat for sensitive species including desert tortoise and MGS. However, the evidence shows that the project's incremental effect of habitat loss, when combined with habitat loss created by existing development throughout the range of these affected species would be less than significant with acquisition and enhancement of compensatory habitat as required by Condition of Certification **BIO-15**.

The project's contribution to the proliferation of non-native weeds, addition of subsidies for predators (e.g., ravens), introduction of additional wildlife hazards such as evaporation ponds and project traffic, will result in cumulative considerable impacts on desert tortoise and other sensitive wildlife. But, as shown by the evidence, we find that implementation of Conditions of Certification **BIO-7**, **BIO-18**, and **BIO-19**, will make the project's contribution to cumulative impacts less than cumulatively considerable.

With respect to future foreseeable projects, the evidence shows that solar and wind projects are proposed on approximately 553,000 acres of BLM land and 13,900 acres of non-federal land in the Western Mojave Planning Area. (Exs. 300, §4-1, 302, pp. 5.2-48 – 5.2-49.) Combined with existing cumulative conditions in the western Mojave Desert, these proposed projects have the potential to further reduce and degrade native plant and animal populations, especially sensitive species such as desert tortoise.

The foreseeable projects in the Harper Lake area are listed below. These projects are located within 10 miles of the AMS site. (Ex. 300, § 4-1, Table 3, 302, p. 5.2-49 – 5.2-50.)

- Hawes Composting Facility
- State Route (SR) 58 via Hinkley
- Solar Photovoltaic Project (BLM:CACA 48941)
- Wind Project (BLM: CACA 46805)

Construction of the proposed project and the PV project would essentially surround the ACEC with solar fields thereby reducing its habitat quality. Development of these projects would make the ACEC and marsh less accessible to wildlife; however, access would be maintained south of the ACEC, which is the most used area by wildlife.

While no precise estimate can be made of the future habitat loss associated with the proposed projects listed above, collectively these projects would remove and fragment over 16,000 acres of habitat for desert wildlife and plants. However, the majority of habitat within the project area is degraded and comprises developed, disturbed, fallow or active agricultural land. Therefore, the AMS project's incremental effect of habitat loss would be less than cumulatively considerable with acquisition and enhancement of compensatory habitat required by Condition of Certification **BIO-15**.

In addition, the reasonably foreseeable future development projects in the Harper Lake area combined with the AMS project present the same threats to sensitive wildlife as discussed above. Traffic impacts to desert tortoise would be exacerbated by increased traffic volumes along SR-58 resulting from the SR-58 via Hinkley project. Predation pressure on juvenile desert tortoises and other vulnerable wildlife would be increased through elevated raven populations as a result of resource subsidies at the proposed Hawes Composting Facility, which would process green material and biosolids. Noxious weed proliferation would be facilitated by the construction of new roads and movement of vehicles and equipment. But, as shown by the evidence, these incremental effects of the proposed project would be mitigated to less than significant levels through implementation of Conditions of Certification, particularly **BIO-7**, **BIO-18**, and **BIO-19**.

Based on the evidence, we find that the incremental effects of habitat loss and degradation and species mortality attributable to the AMS project is less than cumulatively considerable with implementation of Conditions of Certification.

9. LORS Compliance

The AMS project must comply with state and federal laws, ordinances, regulations, and standards (LORS) that address state and federally listed species, as well as other sensitive species and habitats, and must secure the appropriate permits to satisfy these LORS. Under the Warren-Alquist Act, the Energy Commission has exclusive jurisdiction over the permitting process for all thermal power plants rated 50 MW or more. [Pub. Res. Code § 25500 et seq.]. Under the Act, the Energy Commission's certificate is "in lieu of" other state, local, and regional permits. (*ibid*.) The Commission's streamlined permitting process accomplishes a primary objective of the Renewable Energy Action Team, as identified in the Governor's Executive Order S-14-08 to create a "one stop" process for permitting renewable energy generation facilities under California law.

a. State LORS

The record establishes that Staff coordinated joint environmental review with CDFG, the Lahontan RWQCB, as well as the USFWS. The Conditions of Certification adopted herein satisfy the following state LORS and take the place of terms and conditions that, but for the Commission's exclusive authority, will have been included in the following state permits:

Under the Warren-Alquist Act (Pub. Resources Code § 25500), the Energy Commission's certificate for thermal power plants rated 50 MW or more is "in lieu of" other state, local, and regional permits Staff has recommended all required terms and conditions that might otherwise be included in state permits into the Energy Commission's certification process. The Conditions of Certification would satisfy the following state LORS and take the place of terms and conditions that, but for the Commission's exclusive authority, would have been included in the following state permits:

Incidental Take Permit: California Endangered Species Act (Fish and Game Code Section 2050 et seq.)

The California Endangered Species Act (CESA) prohibits the "take" (defined as "to hunt, pursue, catch, capture, or kill") of state-listed species except as otherwise provided in state law. Staff coordinated closely with CDFG regarding impacts to state-threatened desert tortoise, state-threatened Swainson's hawk, and state-threatened MGS in order to capture any measures that would be required in an Incidental Take Permit (ITP) under section 2081(b) of CESA. To facilitate this, the Applicant submitted a draft ITP application to the Energy Commission and CDFG. The Conditions of Certification herein were developed in coordination with CDFG and are likely to be consistent with the terms and conditions required in the ITP, if it were issued. Therefore, implementation of the conditions pertaining to state-listed species would ensure compliance with CESA.

Streambed Alteration Agreement: Fish and Game Code Sections 1600-1607

CDFG regulates any changes to the natural flow, bed, or bank, of any river, stream, or lake that supports fish or wildlife resources. As described above, construction and operation of the proposed project would result in direct impacts to 11.18 acres of waters of the state (1.74 acres of tamarisk scrub and 9.44 acres of dry lakebed). CDFG does not typically exert jurisdiction over these habitat types as waters of the state. The Applicant submitted an application for a Streambed Alteration Agreement (SAA) in February 2010, which provided information in a format familiar to CDFG. But for the Commission's exclusive authority, CDFG would otherwise issue a SAA (1600 permit) that requires removal of tamarisk as mitigation for impacts to waters of the state. In addition, the terms and conditions of CDFG's SAA would require a five year monitoring and reporting program to ensure complete eradication of tamarisk. Condition of Certification **BIO-16** incorporates this requirement. With implementation of this

the AMS project would be in compliance with LORS protective of waters of the state.

b. Federal LORS

The record further shows that Staff coordinated with USFWS in developing Conditions of Certification to ensure consistency with the terms and conditions that will be required in the USFWS Biological Opinion. Therefore, implementation of the conditions adopted herein pertaining to federally listed species as well as acquisition of a Biological Opinion and implementation of the measures therein would ensure compliance with the following federal LORS:

Endangered Species Act (ESA; 16 USC Section 1531 et seq.)

Potential take of federally-listed species (i.e., federally threatened desert tortoise) requires compliance with the federal Endangered Species Act. “Take” of a federally-listed species is prohibited without a permit, which may be obtained through Section 7 consultation if there is a federal nexus (i.e., involvement of a federal agency other than USFWS that would fund, permit, or authorize the proposed project). The applicant submitted an application to the U.S. Department of Energy (DOE) for a federal loan guarantee to finance the AMS project and was selected by the DOE Loan Guarantee Program Office for due diligence review, including NEPA compliance and ESA consultation. DOE funding is the proposed project’s federal nexus, triggering Section 7 as the appropriate consultation process for ESA compliance. Federal ESA compliance under Section 7 requires the DOE to determine whether the proposed action will affect any federally listed species. Because the proposed project would affect desert tortoise, the DOE is obligated to initiate consultation with the USFWS. Formal consultation is initiated by submitting a Biological Assessment (BA) to USFWS. The BA, which is jointly prepared by the applicant and DOE, presents the proposed project’s effects analysis and measures to avoid, minimize and mitigate impacts to federally listed species. The timeline for section 7 consultation allows for a 90-day consultation period followed by 45 days of analysis for a total review time of 135 days. After 135 days, the USFWS is required to issue a Biological Opinion, which analyzes the impact of the proposed project and presents avoidance and minimization measures. The Biological Opinion may also include an incidental take statement, if USFWS determines that the impacts of the project do not jeopardize the recovery of the listed species.

The Applicant submitted a draft BA to DOE and USFWS for preliminary review in April 2010; however, only a final (i.e., not Draft) BA starts the aforementioned

135-day timeline. Assuming the final BA is determined by USFWS to be complete by June, it is anticipated that a Biological Opinion could be issued by USFWS in October 2010. A Biological Opinion is required prior to site mobilization (refer to Condition of Certification **BIO-21**).

Waters of the U.S. (Clean Water Act Section 404)

Discharge or fill into water of the U.S, including wetlands requires a permit from the USACE. Project design features (i.e., exclusion fencing) would avoid impacts to 1.59 acres of potentially jurisdictional waters of the U.S (tamarisk scrub). The applicant submitted a Jurisdictional Letter Report and a request for concurrence that a Clean Water Act Section 404 permit was not required for the AMS project (EDAW 2009b). 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.

Bald and Golden Eagle Protection Act (Title 16, United States Code, Sections 668-668c)

A recently issued Final Rule (September 2009) provides for a regulatory mechanism under the Bald and Golden Eagle Protection Act (Eagle Act) to permit take of bald or golden eagles comparable to incidental take permits under the ESA. This rule adds a new section at 50 CFR 22.26 to authorize the issuance of permits to take bald eagles and golden eagles on a limited basis. The Eagle Act defines the ‘‘take’’ of an eagle to include a broad range of actions, including disturbance. ‘‘Disturb’’ is defined in regulations at 50 CFR 22.3 as: ‘‘to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.’’

As discussed above, the proposed project may result in “take” of the golden eagle from disturbance to nesting pairs as well as loss of foraging habitat, which may result in loss of productivity for this species. However, implementation of a USFWS-approved Golden Eagle Territory-specific Management Plan (Condition of Certification **BIO-9**) may reduce the likelihood of take and documentation from USFWS (i.e., a letter stating that take would not occur or a take permit) incorporated herein to ensure compliance with the Eagle Act (Condition of Certification **BIO-10**). With implementation Conditions of Certification **BIO-9** and **BIO-10**, the proposed project would be in compliance with the Eagle Act.

10. Public Comment

Staff received comments on the Biological Resources section of the Staff Assessment from the Defenders of Wildlife (Defenders) and the Applicant. As reflected in the record, the Applicant and Staff have resolved all outstanding issues. Thus, we focus this discussion on Defenders' comments as set forth in a letter dated April 15, 2010. The letter focused on use of groundwater, evaporation ponds, and the proximity of the project to the Harper Lake ACEC. (Ex. 302, p. 5.2-53.)

Regarding groundwater, Defenders asserted its belief that the use of groundwater for power plant cooling will be adequately analyzed and resolved through the Commission's analysis, impact mitigation and project certification process. Defenders nonetheless urged Staff to "thoroughly analyze alternatives to the proposed project and recommend an alternative for consideration" that would substantially reduce the amount of groundwater use in the basin, including alternative technologies and overall water conservation. Such conservation should be linked to a goal of partial recovery of the wetland at Harper Dry Lake through groundwater connectivity rather than relying exclusively on delivering pumped groundwater to the marsh via pipeline. Defenders further suggested that Staff consider that existing groundwater supplies will need to support existing and proposed renewable energy projects in the Harper Lake Basin.

Within the Soil and Water section of Staff's Supplemental Staff Assessment – Part B, Staff responded that the Applicant was required to propose a water conservation plan in consideration of several Staff-presented options, including the use of a dry-cooled system. The Applicant chose a plant that would essentially limit future water use in the subbasin by requiring the AMS project to sequester its Free Production Allowance (FPA) in an amount equal to the amount of groundwater the project pumped annually up to the amount of FPA the Applicant has in reserve. The plan further provides that for years when the project's FPA is less than the volume of groundwater pumped by the project, the AMS project would contribute funds to a Mojave Water Agency water conservation program (up to $50,000 annually) to match the shortfall between the volume of groundwater pumped and the project's FPA available for sequestration. Staff's proposed Conditions of Certification **SOIL&WATER-11** and **-12** detail these conservation measures.

Staff further responded that groundwater in the water supply aquifer currently occurs at about 125 to 145 feet bgs, which is substantially deeper than the bottom of the lakebed. Groundwater in the water supply aquifer is connected to other subbasins in the Mojave Basin area that are currently in various states of decline. Also, a presumably low-quality perched water zone, which has limited connection with the deeper water supply aquifer, and may or may not be connected with water in the marsh, occurs in the Harper Lake area that would degrade the relatively higher quality water supply aquifer water if it came into contact with it. Because of the impairment to groundwater quality this perched zone can cause, Staff recommended via its proposed Condition of Certification **SOIL&WATER-4** that on property controlled by the AMS project, all wells that are screened across both zones be properly abandoned.

Recognizing that evaporation ponds were part of the project design, Defenders indicated support for the requirement that they be fenced and netted to preclude avian and other wildlife use. Defenders pointed out, however, that dry cooling would obviate the need for evaporation ponds and should be given strong consideration. Staff replied that detailed analysis is warranted for those alternatives that would reduce or eliminate significant impacts. To avoid significant impacts to wildlife, Staff recommends excluding and/or deterring wildlife from the evaporation ponds as set forth in Staff's recommended Condition of Certification **BIO-19**.

Soil and Water Resources staff concluded that impacts to water resources are also less than significant with mitigation. Because significant impacts to biological and water resources would not occur with implementation of staff's proposed conditions of certification, additional consideration of the dry cooling alternative beyond the analysis presented in the Staff Assessment is not provided.

Finally, Defenders commented that Staff's proposed Conditions of Certification **BIO-7**, **BIO-10**, **VIS-3** and **BIO-14** were inadequate to mitigate impacts to the Harper Lake ACEC below the level of significance. Defenders recommended that Staff develop an alternative that incorporates a buffer between the project and the ACEC within the common boundary of the proposed Beta unit (i.e., SW ¼ of Section 28, T.11 N., R. 4 W). Staff disagreed that a buffer would be beneficial. According to Staff, given the proposed development of the entire Section 33, T. 11 N., R. 4 W. and the proposed location of the drainage outlet, excluding development from the SW ¼ of Section 28, T.11 N., R. 4 W. to provide a buffer would not benefit the ACEC. Staff further stated that with implementation

of the proposed conditions of certification, the ACEC and biological resources therein would not be significantly impacted by the AMS project, including stormwater discharge from the proposed drainage outlet.

Based on the evidence presented in the record, we concur with Staff's determinations. (See, Ex. 302, pp. 5.2-53 – 5.2-54.)

FINDINGS OF FACT

Based on the uncontroverted record of evidence, we find the following:

1. Overall, the proposed project area is composed of degraded habitat, which is of marginal suitability for special-status species and does not support a diverse assemblage of native plants and wildlife.

2. Given the proximity of the AMS project to identified biological resources, construction and operation of the project will result in various direct and indirect effects.

3. Twelve vegetation communities occur within the proposed project area. No special-status plants were observed within the proposed project area; however three special status plants were observed within the 1-mile survey area buffer: desert cymopterus, Mojave fish-hook cactus, and Mojave spineflower.

4. No live desert tortoises were found within the plant site boundary during the surveys, but one live tortoise was observed within the project area. However, the AMS project site contains suitable habitat for desert tortoise and could potentially be occupied by this species in the future.

5. Relatively high concentrations of live tortoise and tortoise sign were documented immediately east and west of the project area.

6. The entire project area is considered burrowing owl habitat.

7. The entire project area is considered suitable habitat for the American badger and the desert kit fox.

8. The nearest suitable nesting habitat for golden eagle is within 4.0 miles of the AMS site.

9. Migratory/special-status bird species were observed during project surveys including the American peregrine falcon, American white pelican, Loggerhead

shrike, Le Conte's thrasher, prairie falcon, short-eared owl, Swainson's hawk, western burrowing owl, Coopers hawk, golden eagle, merlin, yellow warbler, willow flycatcher, and northern harrier**.**

10. Condition of Certification **BIO-7** will minimize the impacts to adjacent native plant communities from the introduction and spread of noxious weeds.

11. Condition of Certification **BIO-7 and AQ-SC3 and AQ-SC4** would reduce potential impacts to special-status plants to less-than-significant levels.

12. Direct and indirect construction impacts to vegetation and wildlife will be reduced to less than significant levels with implementation of impact avoidance and minimization measures described in Conditions of Certification **BIO-7** through **BIO-14**.

13. Implementation of Conditions of Certification **BIO-8, BIO-9,** and **BIO-13** will avoid direct impacts to nests, eggs, or young of migratory birds and will minimize the impacts of construction disturbance to nesting birds.

14. Conditions of Certification **BIO-7** and **BIO-11** impose impact avoidance and minimization measures to reduce construction impacts to desert tortoise including installation of exclusion fencing to keep desert tortoise out of construction areas, reducing construction traffic and speed limits to reduce the incidence of road kills, worker training programs, and other measures.

15. Condition of Certification **BIO-9** and **BIO-10** will reduce potential impacts to golden eagle to less-than-significant levels.

16. Condition of Certification **BIO-13** reduces potential impacts to burrowing owls to less-than-significant levels.

17. Condition of Certification **BIO-14** mitigates potential impacts to the kit fox and badger below significance.

18. Noise impacts to nesting birds and other wildlife at AMS will be less than significant with implementation of Condition of Certification **BIO-8**.

19. Condition of Certification **VIS-3** and **BIO-7** ensure that construction lighting at the AMS will have no adverse effects on wildlife. Condition of Certification **BIO-14** requires nocturnal mammals to be cleared from the project area before construction.

20. Condition of Certification **BIO-15** requires the project owner to acquire and enhance at least 118.2 acres of suitable habitat for Mojave ground squirrel, desert tortoise, and western burrowing owl to offset anticipated habitat loss associated with construction of the AMS

21. Condition of Certification **BIO-18** contains project design features to control raven populations and mitigate impacts to desert tortoise associated with raven predation.

22. Condition of Certification **BIO-7** requires using the minimal amount of water needed for dust abatement, food-related waste management and worker environmental awareness training.

23. Condition of Certification **BIO-19** requires that birds and wildlife be excluded from the evaporation ponds to reduce impacts to less than significant levels. Installation of netting over the evaporation ponds will be required if applicant proposed deterrent technologies fail to exclude wildlife from the evaporation ponds.

24. Condition of Certification **BIO-20** requires that a well capable of providing at least 75 acre feet per year of water to the marsh be in service prior to decommissioning the well on the Beta field. This will mitigate potential impacts to the marsh.

25. Condition of Certification **BIO-21** requires the project owner to implement all terms and conditions developed as part of the Biological Opinion in consultation with USFWS, which will ensure that the project is not likely to adversely affect the desert tortoise or its critical habitat.

26. With implementation of proposed conditions of certification, compliance with laws, ordinances, regulations, and standards pertaining to protection of biological resources would be achieved and direct, indirect, and cumulative impacts would be avoided, minimized, or mitigated to less than significant levels.

CONCLUSIONS OF LAW

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

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;

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[32] 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.

[32] 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.

Verification: The project owner shall submit the specified information at least 60 days prior to the start of any pre-construction site mobilization. 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.

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 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 60 days prior to the start of any pre-construction site mobilization, and concurrent with the submittal of information required for the Designated Biologist approval process outlined in BIO-1. 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.

4. If the Designated Biologist is unavailable for direct consultation, the Biological Monitor shall act on behalf of the Designated Biologist. It is expected 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 45 days prior to the start of any pre-construction site 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 CPM shall review and provide written comments within 15 days of receipt of the WEAP.

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 45 days prior to start of any pre-construction site mobilization.

The CPM, in consultation with other appropriate agencies, will determine the BRMIMP's acceptability within 30 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 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 pre-construction site 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 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 and other wildlife. The speed limit shall not exceed 15 miles per hour within unfenced areas and secondary unpaved 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 closely monitor vegetation removal and grading activities to prevent wildlife injury or mortality.

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, if

necessary, shall occur within the project site and shall be designed, installed, and maintained with the goal of minimizing disturbance. 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 or a Biological Monitor may remove and transfer the animal to a safe location if temperatures are within the appropriate range as identified in the Final Desert Tortoise Clearing and Translocation Plan.

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 at the beginning of each workday, periodically throughout, and at the end of each workday by the Designated Biologist or a Biological Monitor. Should a tortoise or other wildlife become trapped, the Designated Biologist or Biological Monitor shall remove and relocate the individual 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 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. If any golden eagles are recovered dead, they shall be sent to the National Eagle Repository after cause of death has been investigated.

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 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.

Pre-Construction Nest Surveys and Impact Avoidance and Minimization Measures for Migratory Birds

BIO-8 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 10-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 in consultation with the CPM, 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 pre-construction site-mobilization, 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.

Golden Eagle Territory-Specific Management Plan

BIO-9 In addition to the breeding season golden eagle inventory conducted in spring 2010 (per USFWS protocol [Pagel et al. 2010]), a non-breeding season golden eagle inventory survey shall be conducted in late-summer/early-winter 2010 (USFWS, in prep).

If an occupied golden eagle territory is identified within 10 miles of the project site (except for the territory identified at Black Mountain in April 2010) during breeding or non-breeding inventory surveys for the AMS project, the project owner shall prepare and implement a Golden Eagle Territory-Specific Management Plan. This plan shall:

1. Include measures to avoid and minimize disturbance (as defined in 50 CFR 22.3) to golden eagles during project construction and operation activities. Measures may include limited operating periods or no-disturbance buffers within which certain potentially disruptive project activities shall not be conducted, or modification of certain project activities to reduce the potential for disturbance to eagles.

2. Identify monitoring actions and schedule for their implementation to ensure avoidance and minimization of disturbance. Monitoring and reporting shall be conducted pre- and post-activity per Interim Golden Eagle Inventory and Monitoring Protocols (Pagel et al. 2010).

Verification: The project owner shall submit a report to the CPM, CDFG, and USFWS within 30 days of completion of breeding-season golden eagle surveys. This report shall document the results of the inventory and monitoring as described in Pagel et al. 2010.

The project owner shall submit a report to the CPM, CDFG, and USFWS within 30 days of completion of non-breeding season golden eagle surveys. This report shall document the results of the protocol surveys as described in Pagel et al. 2010 or more recent guidance by USFWS (e.g., Pagel et al, in prep).

At least 30 days prior to the start of any pre-construction site mobilization, the project owner shall provide the CPM, CDFG, and USFWS with the final version of the Golden Eagle Territory-Specific Management Plan, based on breeding-season inventory results. This final Plan shall have been reviewed and approved by the CPM in consultation with USFWS. If disturbance to eagles would not occur and a Plan is not warranted, a letter from USFWS documenting this determination shall be submitted to the CPM at least 10 days prior to the start of any pre-construction site mobilization.

An addendum to the Plan may be required by USFWS based on non-breeding season survey results. If required, a final addendum, which has been reviewed and approved by the CPM in consultation with USFWS, shall be submitted to the CPM within 90 days of completion of non-breeding season golden eagle surveys.

Documentation of Bald and Golden Eagle Act Compliance

BIO-10 The project owner shall provide documentation to the CPM that the project is in compliance with the Bald and Golden Eagle Protection Act (Title 16, United States Code, sections 668-668d).

Verification: No less than 10 days prior to the start of any pre-construction site mobilization, the project owner shall submit to the CPM documentation that the project is in compliance with the Bald and Golden Eagle Protection Act (Title 16, United States Code, sections 668-668d). This shall include documentation from the USFWS in the form of written or electronic transmittal indicating the status of the permit, if required, and any follow up actions required by the project owner. Any additional actions shall be added to the BRMIMP and implemented.

Desert Tortoise Exclusion Fencing, Clearance Surveys, and Translocation Plan

BIO-11 A Desert Tortoise Exclusion Fencing, Clearance Surveys, and 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.

D. 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.

E. Fence Inspections. Following installation of the desert tortoise exclusion fencing for the permanent site and stormwater drainage fencing and temporary fencing (if required), 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 area enclosed by the fence 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 percent 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). Clearance survey transects shall be followed as described in the Final Desert Tortoise plan. Additional clearance survey guidelines area provided in the USFWS *Desert Tortoise Field Manual* (www.fws.gov/ventura/speciesinfo/protocols_guidelines).

   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. Any handling efforts shall be in accordance with techniques described in the final Desert Tortoise Plan, which shall be consistent with the USFWS *Desert Tortoise Field Manual* (www.fws.gov/ventura/speciesinfo/protocols_guidelines). If a visibly diseased tortoise is encountered onsite, procedures shall be implemented in accordance with the approved final Desert Tortoise Plan.

3. 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 final 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 Plan.

4. 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 final 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).

5. 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 Plan.

6. 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). Digital photographs of the carapace, plastron, and fourth costal scute shall be taken. Scutes shall not be notched for identification.

Verification: At least 45 days prior to start of any pre-construction site mobilization, 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, 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, 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 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 percent 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, Minimization and Mitigation 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:

   Pre-construction surveys shall be conducted prior to the nesting season (February 1 through August 31) and all burrowing owls will be passively relocated using one-way trap doors. Once the Designated Biologist has verified that all burrowing owls have vacated an occupied burrow, the Designated Biologist shall collapse the burrow, preventing re-occupation.

   A. If ground disturbance cannot be avoided in areas where nesting burrowing owls are active, 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.

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 with air-craft aluminum bands in accordance with the guidance provided by USGS bird banding lab (http://www.pwrc.usgs.gov/bbl) to monitor relocation success. Color banding 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 compensatory mitigation area and a suitable habitat within a 600 meter radius from the project site to assess use of the artificial burrows by owls and relocation success after exclusion from the project area. Surveys shall be conducted using methods consistent with Phase II and Phase III California Burrowing Owl Consortium guidelines (CBOC 1993). Surveys shall be conducted two times in the spring and two times in the winter following eviction. The second survey within a season shall be conducted within 30 days of the first. Surveys shall continue for a period of two years to encompass a total of two spring seasons (4 total spring surveys) and two winter seasons (4 total winter surveys).

Surveys and monitoring shall be conducted using non-invasive methods (i.e., high-powered binoculars, spotting scope, or camera). Owls shall not be trapped or otherwise handled to read the color band.

If survey results indicate burrowing owls are not nesting within the surveyed area, remedial actions may 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 any remedial actions taken shall be submitted to the CPM, CDFG and USFWS no later than January 31 of each year for two years.

4. Preserve and Manage Compensatory Habitat. For each individual owl or pair identified on the project site during pre-construction surveys, off-site mitigation shall be required as described in the California Burrowing Owl Consortium guidelines (CBOC 1993). Determining which ratio to apply depends on whether the proposed compensatory habitat is occupied or unoccupied.

   A. Replacement of occupied habitat with occupied habitat: 1.5 times 6.5 (9.75) acres per pair of single bird

   B. Replacement of occupied habitat with suitable unoccupied habitat: 3 times 6.5 (19.5) acres per pair of single bird.

Compensatory habitat shall be suitable for occupation by burrowing owls and preserved and managed in perpetuity for this purpose. Compensatory mitigation may be within the 118.2 acres proposed for desert tortoise and MGS (refer to **BIO-15**), provided that it also meets the criteria for suitable burrowing owl habitat. 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) may not be identified in the Burrowing Owl Plan. However, the Plan shall propose a location for compensatory mitigation land and the acreage required, quantified according to the CBOC methods 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 45 days prior to start of any pre-construction site mobilization, 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 setts and kit fox burrows in the project area, including areas within 250 feet of the project site. If burrows are detected, each burrow shall be classified as inactive, potentially active, or definitely active.

Inactive burrows and setts 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 burrows and setts 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 Biological Monitor shall directly observe the burrow or sett and block the entrance after the animal exits and the Biological Monitor has verified that there are no animals in the burrow or sett. The burrow or den shall be blocked with natural materials (e.g., rocks, dirt, sticks, and vegetation piled in front of the entrance) or passive hazing methods shall be employed for the next three to five nights to discourage the badger or kit fox from continued use. Passive hazing methods shall be approved by CDFG. Live or other traps shall not be used (CCR Title 14 Section 460). A kit fox or badger shall never be trapped in its burrow/sett. 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, measures implemented, and the results of the measures.

Compensatory Mitigation

BIO-15 To fully mitigate for habitat loss and incidental take of desert tortoise and Mohave ground squirrel as well as 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. 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. 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, MGS, and 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, MGS, and 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 $1,300 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.

The project owner may choose to satisfy its mitigation obligations by paying an in-lieu fee instead of acquiring compensation lands to mitigate for 118.2 acres of habitat, pursuant to California Senate Bill 34 (enacting CESA § 2069 and 2099) or other applicable in-lieu fee provision, to the extent the in-lieu fee provision is found by the Energy Commission to be in compliance with CEQA and CESA requirements.

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 construction-related ground disturbance (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, MGS, and burrowing owl 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.

If electing to use an in-lieu fee provision, the project owner shall request from the Energy Commission a determination that the project's in-lieu fee proposal meets CEQA and CESA requirements.

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, it will be verified that there are no nesting raptors or other MBTA-protected birds.

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 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 any 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: At least 60 days prior to any construction-related ground disturbance, the project owner shall submit to the CPM, USFWS, and CDFG a draft Bird Monitoring Study. The CPM shall review and provide written comments within 15 days of receipt of the Bird Monitoring Study. At least 30 days prior to start of any 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 mitigate cumulative and indirect impacts to desert tortoise 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 and nest removal 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 the project sub-account of the REAT Account held by the National Fish and Wildlife Foundation (NFWF) to support the regional raven management plan. The amount shall be a one-time payment of $105 per acre of land permanently disturbed by the project.

Verification: At least 30 days prior to start of any construction-related ground disturbance activities, the project owner shall provide the CPM, USFWS, and CDFG with the final version of the Raven Management Plan that has been reviewed and approved by USFWS and CDFG. The CPM shall determine the plan's acceptability within 10 days of receipt of the final plan. All modifications to the approved Raven Management 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.

Prior to start of any construction-related ground disturbance activities, the project owner shall submit to the CPM verification of payment to the REAT Account to support the regional raven monitoring plan. Payment shall be included in the AMS project's land management enhancement fund, pursuant to Condition of Certification **BIO-15 (5(D))**.

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 Monitoring and Adaptive Management Plan

BIO-19 The project owner shall design and implement an Evaporation Pond Monitoring and Adaptive Management Plan that meets the requirements of the USFWS, CDFG, RWQCB and the CPM. The objective of the Plan is to define the monitoring and reporting procedures as well as triggers for adaptive management strategies that shall be implemented to prevent wildlife mortality at the evaporation ponds. The plan shall include:

- A description of evaporation pond design features such as side slope specifications, freeboard and depth requirements, which will prevent use by wildlife;
- A detailed description of the wildlife monitoring procedures and schedule. For the initial implementation of a new technology, daily monitoring shall be conducted both at the project evaporation ponds and the wetlands within the Harper Lake ACEC. Monitoring may be reduced to weekly and potentially bi-weekly or monthly depending on the results of initial monitoring period.
- A detailed description of the water quality and water level monitoring procedures and schedule. Water quality and water level monitoring shall coincide with wildlife monitoring to provide a basis for comparative analysis.
- A description of wildlife exclusion/deterrent technologies and adaptive management strategies. Technologies shall include, but are not limited to netting, and shall not disturb or harass non-target wildlife adjacent to the project area.
- Triggers for adaptive management (i.e., modifications to existing technology or replacement with new technology). Adaptive management shall be necessary if: 1) more than one dead bird per quarter is discovered at the evaporation ponds; or 2) one special-status animal is discovered at the evaporation ponds; or 3) noise levels attributable to the technology exceed 60dB at the Harper Lake ACEC wetlands. After three failed attempts at new technology or modification of existing technology, the ponds shall be netted;
- Reporting requirements, to include monthly reporting for the first year if a technology other than netting is used. Reporting may be reduced to monthly or quarterly thereafter if no bird or wildlife deaths are reported during the first year. If wildlife mortality occurs at the ponds or if birds are disturbed at the marsh as described above, the CPM shall be notified within 10 days of the incident and the accompanying adaptive management action to be implemented.

Evaporation pond monitoring and reporting shall continue for the life of the project. The draft Plan submitted by the Applicant (AS 2009d) shall provide the basis for the final plan, subject to review and revisions from the CPM in coordination with USFWS, CDFG, and RWQCB.

Verification: At least 30 days prior to operation of the evaporation ponds, the project owner shall provide the CPM, USFWS, RWQCB, and CDFG with the final version of the Plan that has been reviewed and approved by the CPM in consultation with USFWS, RWQCB, and CDFG. The project owner shall first submit a draft plan to the CPM that incorporates the guidance in this condition. The CPM, in coordination with USFWS, RWQCB, and CDFG, shall provide written comments to the project owner within 30 days of receipt of the draft plan and shall determine the acceptability of the final plan within 15 days of its receipt. All modifications to the approved Plan may be made by the CPM after consultation with USFWS, RWQCB, and CDFG. The project owner shall notify the CPM no less than five working days before implementing any CPM-approved modifications to the Evaporation Pond Plan.

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 45 days prior to the start of any pre-construction site mobilization. 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.

B. SOIL AND WATER RESOURCES

This section focuses on the soil and water resources associated with the project, including the project's potential to induce erosion and sedimentation, adversely affect water supplies, and degrade water quality. The analysis also considers site contamination and any potential cumulative impacts to water quality in the vicinity of the project.

Both the Applicant and Staff provided extensive evidence related to the AMS project's potential effects on soil and water resources. Their collective evidence establishes that with implementation of the adopted Conditions of Certification there will be no significant environmental impacts and the project will comply with all applicable laws, ordinance, regulations, and standards (LORS).

Because the project proposes use of well-drawn groundwater for wet cooling, the Applicant and Staff disagreed on whether the project – absent the water conservation measures discussed below–complies with state and Energy Commission policy regarding the use and conservation of water resources. The Applicant determined that the project is compliant with state policy and requires no related mitigation or conservation measures. Staff concluded, however, that water conservation measures as set forth herein, were required in order to make the project comply with state and Energy commission policy. As more fully discussed below regarding LORS compliance, we agree with Staff.

Despite disagreement on the need for additional water conservation measures to comply with applicable LORS, the Applicant and Staff each presented undisputed evidence and agreed to the Conditions of Certification contained herein. (6/28/10 RT 4-48, 51-58, 64-76, 81, Exs. 1, §§ 2.0, 5.17, Appendixes A, J. K.1, K.2, 2, Attachments A, B, C, G1-G4, 4, 6, 7, 9, 12, 14, 15, 26, 41, 48 [§ 10], Exs. 302, §5.9, 306.)

SUMMARY OF THE EVIDENCE

The AMS project will be located on a relatively flat and previously developed area in Harper Valley, in the eastern Mojave Desert in unincorporated San Bernardino County, California. Water resources in this area are extremely limited and vegetation is sparse.

More particularly, the project would be developed on the western edge of Harper Lake, an alkali playa in Harper Valley. Harper Valley is a topographically closed

basin, surrounded by various mountains and hills. Surface water runoff from mountain precipitation flows through washes and discharges to the alluvium-filled valley. Excess surface flow drains to Harper Lake where it evaporates, creating the Harper Lake playa. There are no documented seeps or springs in the Harper Lake area.

The AMS project site is underlain by the Harper Valley Ground Basin (HVGB), which is approximately 410,000 acres in size as defined by the California Department of Water Resources (DWR). The HVGB as defined by the DWR is larger than the Harper Valley groundwater subarea as delineated within the U.S. Geological Survey (USGS) numerical model developed for the Mojave Basin Area Adjudication. Staff's analysis of water resources, as discussed below, uses the USGS model and references it as the "Harper Lake model zone." (Ex. 302, p. 5.9-7.)

Groundwater from the Harper Lake model zone is the primary natural water supply for the valley region. This groundwater is generally unconfined and has limited hydraulic connection with the regional Mojave Basin area. Groundwater inflow is primarily across the Lockhart Fault and through the Hinkley Gap towards Harper Lake. Groundwater outflow is primarily through agricultural and industrial pumping and consumption.

Historically, as a result of agricultural development, groundwater consumption exceeded groundwater recharge. Under pre-development conditions (i.e., prior to the 1930s), groundwater discharged to Harper Lake. 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 below ground surface (bgs) near Harper Lake. (Ex.. 1, p. 5.17-20.)

The record establishes that the groundwater occurs in two Quaternary alluvial aquifers beneath the AMS project site and generally flows towards Harper Lake. At the project site, the depth to groundwater in the upper aquifer (uQal) is approximately 125 to 145 feet bgs.[33] Transmissivity of the upper aquifer, estimated from well tests, ranges from 100,000 to 300,000 gallons per day per foot (gpd/ft).

---

[33] 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.

Most of the groundwater wells in the vicinity of the AMS project appear to be completed to depths above the basalt layer, 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.

Precipitation and groundwater underflow supply water to the basin. Recharge from precipitation is negligible and, 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. (Ex. 1, pp. 5.17-22 – 5.17-24.)

There are no surface waters located within the boundary of the AMS site. The nearest surface water feature in the project area is a marsh known as the Harper Dry Lake Wetlands. The wetlands are about one mile north of the AMS site and are artificially maintained by the federal Bureau of Land Management (BLM) with groundwater pumped from a former irrigation well located on the proposed Beta field of the AMS site. (Exs. 1, p. 5.17-33; 302, p. 5.9-10.)

1. Soil and Wind Erosion

The proposed construction and operation activities can adversely impact soil resources including increased soil erosion, soil compaction, loss of soil productivity, and disturbance of soils crucial for supporting vegetation and water dependent habitats. These activities make soil particles vulnerable to detachment by wind and water; i.e. soil erosion.

Soil erosion results in the loss of topsoil and increased sediment loading to nearby receiving waters. The magnitude, extent, and duration of those impacts depend on several factors, including the proximity of the AMS project site to surface water, the soil types affected, and the method, duration, and time of year of construction activities. Prolonged periods of precipitation, or high intensity and short duration runoff events coupled with earth disturbance activities can result in on-site erosion. In addition, high winds during grading and excavation activities can result in wind borne erosion leading to increased particulate emissions that adversely affect air quality.
The evidence shows that the project area soils are susceptible to wind and water erosion during construction and operation. Possible erosion could cause

significant offsite impacts without proper erosion control measures. The evidence shows that with implementation of the Applicant-proposed best management practices (BMPs) and Condition of Certification **SOIL&WATER-1**, significant soil erosion, wind erosion, and sedimentation impacts will be avoided or reduced to less than significant levels during both construct and operation. Additional requirements for mitigation of soil erosion impacts are included as a part of waste discharge requirements of Condition of Certification **SOIL&WATER-2**.

2. Stormwater Runoff and Drainage

Off-site stormwater runoff flow will be intercepted as it enters the site and diverted to a central channel and redirected to its expected flow toward the Harper Dry Lake, which has no direct connection to a perennial stream or other navigable waters or permanent water source such as a lake or spring and does not qualify as jurisdictional feature subject to regulation under the federal Clean Water Act. This redirected overland flow will not impact adjacent land uses.

On-site generated stormwater runoff will be contained on site. For instance, the solar fields will be bordered by berms of sufficient height to contain storm water runoff. Sheet flow within the solar field will be managed through newly constructed internal drainage facilities designed to capture the water and allow it to percolate and evaporate within the fields. The Applicant designed eight on-site drainage channels according to the 1986 San Bernardino County Hydrology Manual. The channels are sized for the 100-year storm. (Exs. 1, pp. 5.17-38 - 5.17-39, 302, p. 5.9-18 – 5.9-20.) Because these drainage channels may be subject to scour and erosion, they require maintenance to ensure that peak flood flows are routed away from the solar fields. The channel maintenance program specified in Condition of Certification **SOIL&WATER-3**, will ensure that the channels perform at design capacity throughout the life of the project.

On-site runoff flow within the power island areas will be intercepted treated to remove possible pollutants and recycled as plant cooling water. Storm water from the power islands and other plant drains will be sent to on-site oil-water separators and then subsequently added to plant cooing water.

Based on the evidence, we find that stormwater runoff from the site as well as potential nuisance flows from plant operation and maintenance will not cause significant impacts with implementation of Conditions of Certification **SOIL&WATER-1, -2**, and **-3. SOIL&WATER-1** requires the project owner, prior to site mobilization, to obtain the CPM's approval for a site specific Drainage,

Erosion, and Sediment Control Plan (DESCP**)** that ensures protection of water quality and soil resources. The plan must be consistent with the grading and drainage plan required by Condition of Certification **CIVIL-1**. **SOIL&WATER-2** requires the project owner to comply with the Waste Discharge Requirements established in Attachments A, B, and C for the construction and operation of evaporation ponds, land treatments units, and storm water management system. **SOIL&WATER-3** discussed above requires a Channel Maintenance Program for routine maintenance of the project's storm water channels, which includes annual reports to the CPM.

3. Wastewater Management

During construction, sources of wastewater would include equipment wash water and hydrostatic test water. Improper handling or containment of construction wastewater could cause a broad dispersion of contaminants to soil or groundwater. Discharge of any non-hazardous construction-generated wastewater must comply with discharge regulations.

The record explains how the different types of wastewater will be handled. Equipment wash water would be transported to an appropriate treatment facility. Hydrostatic test water would be discharged to land or trucked off-site to an appropriate treatment and disposal facility. Discharge of the hydrostatic test water to land would be done in accordance with the SWRCB Water Quality Order No. 2003-003-DWQ as a discharge to land with a low threat to groundwater. Sanitary wastewater generated during construction would be containerized in portable facilities with the waste removed by a licensed waste hauler. (Ex. 302, pp. 5.9-34 - 5.9-35.) With the use of BMPs and compliance with LORS as specified in Condition of Certification **SOIL&WATER-8**, we find there would be no significant impact from construction-generated wastewater.

During plant operations, process wastewater would be generated from the reverse osmosis/demineralizer system, chemical feed area, and general plant drains. The reverse osmosis/demineralizer system water would be discharged to evaporation ponds sized to accommodate the anticipated discharge. Wastewater from the chemical feed area and general plant drains would be processed through. The oil and sludge from the oil/water separator would be removed off-site to a recycling facility or landfill. (Ex. 302, pp. 5.9-34 – 5.9-35.)

HTF-affected soil would be temporarily stored and treated in bioremediation/land farm units on approximately 1.5-acre units near each power block. (Ex. 1, pp.

5.17-34 – 5.17-36.) The HTF-affected soil would be stored until chemical analysis are conducted to determine if the affected soil should be managed as hazardous or non-hazardous waste in accordance with Condition of Certification **WASTE-7**. We concur with the Staff-prepared waste discharge requirements, which are contained in Attachments A, B, and C and mandated by Condition of Certification **SOIL&WATER-**2. We find that implementation of **SOIL&WATER-2,** potential HTF-related operation impacts would be less than significant.

Sanitary wastes generated during operation of the AMS project would be generated by sinks, toilets, and other sanitary facilities. Because there are no sanitary sewer connections, the sanitary wastewater would be processed through a septic system and discharged to a leach field. Solids would be periodically removed by a professional service. The maximum average daily wastewater flow from each power block to its corresponding leach field is expected to be 1,250 gallons. Compliance with Condition of Certification **SOIL&WATER-9** will ensure that the sanitary waste is managed in accordance with appropriate BMPs and 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. (Ex. 302, p.5.9-35.)

4. Project Water Supply and Treatment

a. Water Rights Under the Mojave Basin Area Adjudication

The record contains significant evidence establishing that the Applicant possesses groundwater rights in the amount of 10,478 acre-feet per year (AFY). These acquired rights were granted in significant part by the final judgment from extensive litigation arising from Mojave Basin area overdraft issues. The judgment, commonly referred to as the Mojave Basin Area Adjudication (Adjudication) is enforced and implemented by a subdivision of the Mojave Water Agency (MWA) identified by the Adjudication as the “Watermaster.”

For purposes of administration, the Adjudication divided the basin into five separate hydrologic subareas: Este (East Basin), Oeste (West Basin), Alto (Upper Basin), Centro (Middle Basin), and Baja (Lower Basin). The AMS project, the above-described Harper Lake model zone, and the HVGB are all within the Centro subarea.

While the Adjudication allocates groundwater rights, it does not provide absolute protection against overdraft. Instead, the Adjudication focuses on groundwater

volumes (in terms of water rights) with a goal to balance groundwater supply and consumption. To manage the volume of water pumped in each subarea, the Adjudication has established water allowances for each subarea pumper. **Soil & Water Table 1** below shows the water allowance and use in the Harper Lake area, including the Applicant's allocation.

Soil & Water Table 1
Water Allowance and Use in the Harper Lake Area

Harper Lake Area Water Allowance		
Water Allocation	**Water Volume (AF/y)**	**Description**
Base Annual Production (BAP)	12,542	This volume is the verified maximum annual volume of production by each producer in a subbasin during the 5-year period from 1986 to 1990.
Free Production Allowance (FPA)	10,036	The amount of BAP that may be produced from a subarea free of any replacement obligation (a fee charged by the Watermaster for a volume of water used in excess of the FPA). In the Centro subbasin, the FPA is 80% of the BAP and represents an initial 20% ramp down volume.
Production Safe Yield (PSY)	4,144	PSY is defined by the highest average annual volume of water that can be produced from a subarea without causing a long-term decline in water levels. The numerical PSY volume is defined by groundwater modeling and ongoing groundwater level measurements. The goal of the adjudication is to balance long-term supply and demand and make up any deficit by the purchase and recharge of supplemental water so that the FPA is within 5% of the PSY.
AMS Project Water Allowance and Water Use		
Water Allocation	**Water Volume (AF/y)**[34]	**Description**
Base Annual Production (BAP)	10,478	Equals the AMS project's land purchase, transfer, and option purchase BAP volume.
Free Production Allowance (FPA)	5,239	Represents a consumptive use adjustment for changing the groundwater use from agricultural to that used by the AMS project. One-half (50%) of the agricultural water is assumed to have returned to the groundwater as return flow. 5,239 AF/y = 10,478 AF/y / 2.
Adjudication Ramp Down (actual FPA)	4,192	Equals the adjudication ramp down volume, which is about 20% of the proposed AMS project's FPA.
Volume the AMS project Proposes to Use	2,160	The maximum volume of groundwater the AMS project proposes to use.

[34] The above BAP and FPA allocations are based on agricultural use of the groundwater. (Ex. 306, p.12.)

Existing Cumulative Harper Lake Area Production		
Water Use	**Water Volume (AF/y)**	**Description**
2007-08 Verified Production	1,731	The verified production in the Harper Lake area during 2007 to 2008. Includes pumping by the SEGS 8 & 9 power plants.
AMS Project Proposed Production	2,160	The maximum proposed groundwater pumping by the AMS project.
Total Harper Lake Area Production	3,891	The total groundwater pumping in the Harper Lake area, when the AMS project proposed maximum pumping is included.
Remaining Balance for PSY	253	The volume of Harper Lake area Production Safe Yield (PSY) in excess of the Total Harper Lake Area Production (4,144 AF/y minus Total Harper Lake Area Production of 3,894 AF/y).

Source: Ex. 302, pp. 5.9-23.

As indicated by the table above, each subarea's production safe yield (PSY) is defined as the highest average annual volume of water that can be produced from a subarea under one of three specified scenarios as described in the record. Based on actual water level data, the PSY level may be incrementally increased or decreased year to year. The Adjudication management goal is to bring the FPA to within five percent of the PSY.

Current (2007-2008) groundwater pumping in the Harper Lake area is approximately six percent less than the PSY. In the Centro subbasin, the FPA is 80 percent of the BAP and represents an initial 20 percent ramp down volume.

b. Project Water Requirements and Treatment

The project's estimated water requirements are shown below in **Soil and Water Resources Table 2** below. The data provided by the Applicant and Staff, in coordination with the Watermaster, shows that project has sufficient allocated rights under the Adjudication for the project's water requirements. The maximum volume of water the AMS project would use (2,160 AF/y) is less than the initial adjudicated ramp down value (4,192 AF/y). And, even if the ramp down value increases to 50 percent of the FPA (approximately 2,620 AF/y), the AMS project would have enough allocated groundwater for plant operations.

Soil & Water Table 2
Proposed Annual Project Water Source and Use

	Water Demand[1]	Water Supply Source	Estimated Average Volume of Water Required	Estimated Maximum Volume of Water Required
Construction	Soil Compaction and Dust Suppression	Proposed On-site Groundwater Wells and One Existing On-site Well	1,716,000 gpd (1,025 AF/y)	1,716,000 gpd (1,025 AF/y)
	Ongoing Construction Needs		59,800 gpd (68 AF/y)	61,750 gpd (70 AF/y)
	Drinking Water[2]		1,660 gpd (1.9 AF/y)	2,324 gpd (2.6 AF/y)
	Total Construction Water Demand		**1,095 AF/y**	**1,098 AF/y**
Operation	Cooling Water Makeup, Mirror Wash Water; and Maintenance[3]	Proposed On-site Groundwater Wells	2,140 AF/y	2,140 AF/y
	Landscaping[4]		Included in the Total Water Requirement	
	Fire Protection (used as necessary)		363,200 gallons	363,200 gallons
	Drinking and Sanitation		20 AF/y	20 AF/y
	Total Operational Water Demand		**2,160 AF/y**	**2,160 AF/y**

Source: Ex. 302, p. 5.9-21.
Notes: 1. Construction water use is based on a 26-month construction schedule. Operations water use assumes the AMS project would operate at 100% of the plant's total capacity over the life of the project. 2. Estimated at 2 gallons per day per person. 3. The AFC states that the cooling water makeup, mirror wash water, and maintenance water would be 2,163 AF/y. Groundwater impact modeling conducted by the applicant used a volume of 2,160 AF/y. To be consistent with the applicant's modeling, staff's analysis uses a volume of 2,160 AF/y. 4. Water that would be used for landscaping was not identified by the applicant and therefore is assumed to be included in the total operational water demand.

As discussed, groundwater will meet the project's process and cooling water needs and domestic needs. Both the Alpha and Beta plants will have a production well and a backup well. Each plant's power block would also have a dedicated water treatment unit for plant process needs and a package treatment unit for potable water. (Ex. 302, p. 5.9-11.)

The raw water, circulating water, process water, and SCA washing water will all require onsite treatment. The treatment will vary depending on the quality required for each use. In general, the groundwater will be pumped to the raw water storage tank and biocide will be used to treat the water. The water will be treated once again with biocide as necessary after transfer to the service water tank. This water will be used directly from the service tank in the cooling tower as make-up water. (Exs. 48, 302, p. 5.9-34..)

Process wastewater would be generated from sources including cooling tower blowdown. Water will cycle through the cooling tower several times before it is blown down. The blowdown will then be processed through various methods including clarification and reverse osmosis before it is reused for SCA washing and steam system makeup water. Before becoming process wastewater, the groundwater will have been recycled many times prior to ultimately being discharged to the evaporation ponds for final dewatering. (Exs. 1, pp.2.0-15 -2.0-20. 48, 302, p. 5.9-34.)

Reject water from this treatment process at each power block would be discharged to two 5-acre, double-lined evaporation ponds. The evaporation ponds will be sized to retain all solids generated by the evaporation of the wastewater during the life of the project. (Exs., , pp.2.0-15 -2.0-20, 48, 302, pp. 5.9-2, 5.9-40.)

5. Potential Project Impacts to Groundwater Levels and the Basin Balance

Even though the project's water use requirements are within its ramp down FPA, Staff and the Applicant evaluated the potential impact of the project's proposed groundwater use on groundwater levels and the basin balance in the HVGB. Both parties used a computer model of the Mojave Basin developed by the USGS for the Adjudication. (Exs. 302, pp. 5.9-24 – 5.9-29, Appendix B.)

The record details the assumptions underlying Staff's modeling and the method by which Staff reconciled differences between its 30-year modeling analysis and the Applicant's. (Ex. 302, Appendix B.) Under Staff's modeling analysis, the groundwater levels in the vicinity of the AMS project are recovering from past impacts and the recovery effect decreases with distance from the AMS project site.

Staff's modeling analysis used local aquifer conditions and the expected well construction configuration to evaluate the potential project-related pumping and

recharge impacts to a representative sample of wells in the Harper Lake model zone.

As explained in the record, all use of wells within a groundwater basin contributes toward a lowering of water levels at other well locations. The overlap of drawdown among two or more wells is called “well interference,” and is considered significant when it changes conditions in and around an existing well to the point that it affects well yield. Reductions in well yield can occur as the static or pumping water level drops below the top of the well screen or the water production capacity decreases as a result of incrusting deposits clogging the well screen openings and water-bearing formation around the well screen. A loss of yield is appreciable if the well becomes incapable of meeting 1) maximum daily demand, 2) dry-season demand, or 3) annual demand. (Ex. 302, Appendix. B.)

The 2008 data was the most recent data available to Staff and Staff therefore used 2008 as representing baseline groundwater conditions. (Ex. 302, Appendix B, p. 5.9-91.) Staff’s project impact conclusions based on simulated groundwater conditions are summarized below:

(1) Water levels at some of the 29 well locations are recovering as a result of pumping decreases in the subarea. (Ex. 302, Appendix B, p. 5.9-91.)

(2) For project construction, simulated drawdown at 29 well locations range from -4 to 11 feet. (The negative drawdown indicated simulated water levels in 2012 are greater than in 2008 even with project pumping. To account for modeling uncertainty, the maximum drawdown is estimated to range from -2 to 18 feet. Ex. 302, Appendix B, p. 5.9-91, Figure 2.)

(3) For project pumping during operation, simulated drawdown at 29 well locations range from -10 to 16 feet. The negative drawdown indicates simulated water levels in 2042 are greater than in 2008 even with project operation pumping. To account for modeling uncertainty, the maximum drawdown is expected to range from -2 to 19 feet.

(4) Proposed operation pumping will remove 1,860 AFY of groundwater from the storage in the Harper Lake model zone. This amounts to about 570 AFY of water that would otherwise have contributed to increased aquifer storage and 1,290 AFY from water currently in storage. And, by the end of project life (estimated to be 2042), the project will have removed approximately 50,900 AFY of groundwater from storage (41,300 AFY stored in place and an additional 18,200 AFY that would have been added

to storage. (Ex. 302, Appendix B, pp. 5.9-91-5.9-92.) Thus, future water levels are expected to decline as a result of project pumping.

(5) Simulated water level decline occurs in both the Harper Lake model zone and across the Lockhart fault into other portions of the Centro subarea. Over the life of the project, simulated pumping shows removal of 59,500 AFY and 12,800 AFY of groundwater from these two areas, respectively. (Ex. 302, Appendix B, p. 5.9-92.) These simulated storage reductions represent one percent of the simulate total storage volume in place within the Harper Lake model zone and 0.1 percent of the total simulate storage volume in place within the remaining portions of the Centro subarea. This change is less than five percent – it is estimated to be three percent - of the groundwater currently accessible for extraction. Therefore, project pumping is expected to have a negligible effect on groundwater storage. (Id.)

(6) The Harper Lake model zone has limited connection with the Mojave River, and based on model results the storage decline within the Harper Lake model zone has negligible effect on simulated stream leakage to the Centro subarea from the Mojave River. (Ex. 302, p. 5.9-29, Appendix B.)

Thus, even though the evidence established that water level impacts are not expected to be significant, monitoring and oversight are still necessary to confirm the conclusions of the impact analysis and to determine whether private wells adjacent to the project site experience reliability impacts to their private water supply. We have therefore adopted Condition of Certification **SOIL&WATER-6**, which requires the project owner to: (1) conduct a field reconnaissance and identify all existing wells within a radius defined by the 20-foot drawdown contour interval as predicted by Staff's groundwater model at the end of the project life; (2) determine and record the well construction for each well (e.g., well screen interval, pump depth, and static water level); and (3) establish a groundwater monitoring network that utilizes these existing wells to monitor and document potential changes in groundwater use, groundwater levels, and groundwater level trends, if any, relative to background and pre-project conditions. (Ex. 302, p. 5.29-28.)

Furthermore, to ensure that the AMS project's water use is consistent with the volume of groundwater use analyzed by Staff, we have also adopted Condition of Certification **SOIL&WATER-5,** which limits construction water use to 1,098 AF/y and operation water use to 2,160 AF/y.

Based on the evidence, implementation of Conditions of Certification **SOIL&WATER-6** and **-7** and **BIO-16** and **BIO-20** will further ensure that project pumping will not have significant adverse impacts on aquifer storage volumes or other users in the HVGB or Centro Subarea.

6. Potential Impacts on Operational Yield

Staff conducted additional model analysis to estimate an operational yield for the Harper Lake model zone. (Ex. 302, p. 5.9-29.) The operational yield is the maximum pumping rate resulting in no long-term cumulative loss in Harper Lake model zone groundwater storage over the life of the project.

With the addition of the AMS project, the simulated pumpage in the Harper Lake model zone is expected to be 7,750 AFY. This is comprised of 5,490 AFY of existing pumpage plus 2,260 AFY of maximum pumpage by the project.[35] The 5,490 AFY figure represents the 2008 modeled pumping rate, developed by the Applicant from Mojave Water Agency data. (Ex. 302, p. 5.9-29.) The evidence shows that this is a conservative figure that likely over-estimates the projected future groundwater storage decline.

Based on the Applicant's modeling, the operational yield of the Harper Lake model zone is 6,235 AF/y. This means that simulated Harper Lake model zone pumpage can be as high as 6,235 AF/y and not cause a simulated long-term net decline in Harper Lake model zone storage.

If a 1,515 AF/y reduction in simulated pumpage becomes necessary under the Adjudication, to bring the Harper Lake model within five percent of this operational yield when the AMS project consumes the 2,260 AFY of groundwater, this would result in a 2,906 AFY reduction of the Applicant's 5,239 AFY FPA. When the initial twenty percent ramp down (discussed above) is combined with the secondary ramp down, the Applicant's FPA is reduced to 3,143 AFY. Even with the combined rampdowns, the FPA volume is still almost 30 percent greater than the project's proposed maximum groundwater use. (Ex. 320, p. 5.9-29.)

[35] This figure is for modeling analysis. Condition of Certification **SOIL&WATER-5** limits project water use to 2,160 AFY.

7. Potential Impacts to Biological Resources

As more fully discussed herein and in the **BIOLOGICAL RESOURCES** section of this Decision, the evidence establishes that the project's proposed groundwater pumping will not have a significant impact on biological resources. Implementation of Conditions of Certification **SOIL&WATER-6** and **BIO-20** will further ensure no significant impacts to biological resources due to the project's proposed groundwater pumping. (Ex. 302, p. 5.9-30.)

8. Potential Impacts to Groundwater Quality

Groundwater quality data was obtained from Ryken well, which is located approximately in the middle between the proposed Alpha and Beta plants. While the Ryken well provides an indication of the groundwater quality at the AMS project site, groundwater quality beneath the site and adjacent areas varies naturally both laterally and with depth as well as over time.

Ryken well water sampling indicates that the quality of groundwater for project use has a TDS concentration of approximately 1,200 to 1,500 mg/L. (Ex. 320, p. 5.9-40.) Under California's Drinking Water Standards, the groundwater is *slightly* brackish and could be treated for possible municipal supply. (Ex. 302, p. 5.9-40, see also LORS discussion below.) Currently, groundwater is used locally for drinking supplies.

Staff's analysis of the available, limited data indicates that the AMS project's use of groundwater would not significantly impact the quality of groundwater in the HVGB. But could, however, contribute to lateral movement of poorer quality groundwater from beneath the Harper Lake towards the BLM marsh water supply well even though there is no evidence to support or refute an assumption that poor quality groundwater may exist in the main aquifer beneath the lakebed. Indeed, Staff and the Applicant report different results from their respective analyses of groundwater movement and quality. (Ex. 302, pp. 5.9-32 – 5.9-33.)

The Applicant's modeling results show that the project's groundwater pumping would likely, over time (50 to 100 years), induce the lateral movement of poorer quality groundwater from the Harper Lake area towards the project's water supply wells. In contrast, Staff's evaluation of available historical data does not indicate that groundwater produced by the Ryken well decreased in quality as a result of groundwater movement from beneath Harper Lake. (Id.)

Thus, the collective evidence suggests that a water quality impact to the existing BLM marsh water supply well is not likely to occur from proposed AMS project pumping. In an abundance of caution to ensure no impacts to groundwater quality in the existing BLM marsh water supply well occur, we have adopted Condition of Certification **SOIL&WATER-7**, which requires the project owner to 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, for three consecutive years, it is determined that the marsh water-supply well has been impacted by project pumping (i.e., the composition of the water produced exceeds pre-project constituent concentrations in TDS, sodium, or selenium concentrations) and BLM determines that such water quality would adversely affect the marsh, the project owner must provide treatment or a new water supply to either meet or exceed pre-project water quality conditions.

Specifically with respect to the BLM marsh well, we find that the well's filter pack and screen likely intercept poor quality, shallow perched water and the better quality upper aquifer groundwater. (Ex. 302, p. 5.9-33.) If so, there is potential for the well water to become degraded. Thus, we concur with Staff's recommendation that any replacement 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. We further impose Condition of Certification **SOIL & WATER-4** on the project owner to ensure that Ryken well is properly abandoned and that new project wells are constructed in a manner that ensured that water quality impacts are mitigated to less than significant levels. (Ex. 302, p. 5.9-33.)

a. Cumulative Impacts

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of reasonably foreseeable future projects (Cal. Code Regs., tit. 14, §15130). A summary of the estimated water use of reasonably foreseeable projects in the Harper Valley and their potential water use is presented below in **Soil & Water Table 3**.

Soil & Water Table 3

Large-Scale Projects, Developed, Under Development, or Reasonably Foreseeable Projects in the Harper Valley Basin

Potential New Groundwater Users	Estimated Water Use	
	During Construction	During Operation
Hawes Composting Facility. A 160-acre biosolids and green material composting facility proposed to produce agricultural grade compost.	Negligible	1.1 AF/y (Groundwater Wells or Trucked-In Water)
State Route 58 Upgrade and Realignment. Proposed upgrade and realign of 10-miles of two-lane highway to a 4-lane divided freeway Hidden River Road to Lenwood Road, in San Bernardino County.	Negligible	None
First Solar, Solar Photovoltaic Project (BLM: CACA 48941). A 5,033-acre, 585 MW solar photovoltaic project proposed on BLM land.	Unknown	Estimated at 58 AF/y (Groundwater Wells)
Horizon Wind Energy, Wind Project (BLM: CACA 46805). A 10,073-acre wind project proposed on BLM land.	Unknown	None

Source: Ex. 302, p. 5.9-35.
Note: Construction of these projects would likely temporarily use water resources over a limited duration of time. Future construction in the Harper Lake area could be limited by the existing Desert Wildlife Management Area, Mojave Ground Squirrel Conservation Area, and Desert Tortoise Critical Habitat.

a. Cumulative Impacts to Soil and Storm Water

Project construction and operation will result in both temporary and permanent changes to the soil and storm water drainage patterns at the AMS project site. These changes could incrementally increase local soil erosion and storm water runoff. However, as discussed above, these potential impacts would be prevented or reduced to a less than significant level through the implementation of BMPs, a final DESCP, and construction SWPPP, and compliance with all applicable erosion and storm water management LORS.

As shown by **Soil & Water Table 3** above, four projects are proposed for construction within Harper Valley. Existing development consists of SEGS VIII and IX, some agriculture business, and some residences. This combination of planned and existing development has the potential to increase local soil erosion and storm water runoff.

However, because the development must comply with all applicable erosion and storm water management LORS, cumulative impacts would be prevented or reduced to a less than significant level. Moreover, the AMS project's compliance with Conditions of Certification **SOIL&WATER-1** and **-2** should ensure that the project does not significantly contribute to the cumulative soil erosion and storm water impacts from other development in the vicinity.

b. Cumulative Impacts to Wells

The AMS project would not cause a cumulatively considerable impact to water levels in other wells in the Harper Lake model zone. The reasonably foreseeable groundwater use by other proposed projects in the Harper Lake model zone may increase by 60 AFY (See **Soil & Water Table 3** above). The modeling analyses show that this additional groundwater use would increase cumulative future groundwater use from 2,160 AFY to 2,220 AFY but is not likely to result in a cumulative lowering of groundwater levels that would exceed the threshold for protection of wells in the Harper Lake area. Implementing Conditions of Certification **SOIL&WATER-6** and **-7,** the project owner would establish a groundwater monitoring network and semi-annually monitor and document groundwater use, groundwater levels, and groundwater level trends, thus the AMS project's cumulative contribution should be less then significant. (Ex. 302, p. 5.9-36.)

c. Cumulative Impacts to the Basin Balance

During construction of the AMS project, the groundwater demand would be as high as 1,098 AFY. Construction of the AMS project is estimated to take 26 months to complete. During operation, the project would use groundwater for potable and plant processes at a maximum rate of approximately 2,160 AFY. This volume of groundwater use, combined with the additional projects identified in **Soil & Water Table 3** above, could increase total groundwater use in the Harper Lake area by up to 60 AFY to a total of 2,220 AFY. However, the modeled impacts to the basin balance from the foreseeable pumping are shown by the record to be less than significant. (Ex. 302, pp. 5.9-36-5.9-37.)

9. Compliance with LORS

As discussed above, the AMS project proposes a wet-cooled facility that would use a maximum of 2160 AF/y of groundwater from on-site wells. This pumped water will be used for cooling as well as for domestic use by workers, dust suppression, and mirror washing. The project will not use a zero liquid discharge (ZLD) system. Instead, reject water from the treatment process would be discharged to evaporation ponds.

The following LORS specifically address water use and conservation:

California Constitution

Article X, section 2 prohibits the waste or unreasonable use, including unreasonable method of use, of water, and it requires 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. Res. Code, § 25008).

State Water Resources Control Board (SWRCB) Resolutions

The SWRCB 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 water with a TDS concentration of 1,000 mg/L or less should be considered fresh water (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).

Drinking Water Standards

The Drinking Water Standards found in Title 22 of the California Code of Regulations are the primary and secondary maximum contaminant levels (MCL) which are applied to determine the acceptability of water for delivery to the public by community water systems. Secondary MCLs are based on aesthetics and intended to protect odor, taste, and appearance.

Integrated Energy Policy Report (IEPR)

In the 2003 IEPR, the Energy Commission reiterated certain principles from SWRCB's Resolution 75-58 and clarified how they would be used to discourage use of fresh water for cooling power plants under the Commission's jurisdiction. The IEPR 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 IEPR, 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 IEPR publication in 2003, dry cooling was already establishes as feasible for natural gas projects under the Commission's jurisdiction. (IEPR, p. 39).

The Applicant maintains that the project is compliant with state water policy and requires no related mitigation or conservation measures. Staff contends, however, that implementation of the water conservation measures are necessary in order for the project to comply with state and Energy commission policy. We agree with Staff.

The record is clear that the AMS project is a solar electric generating facility, proposed by the Applicant to further goals that include helping to achieve the state's renewable energy objectives and support the state's Renewable Portfolio

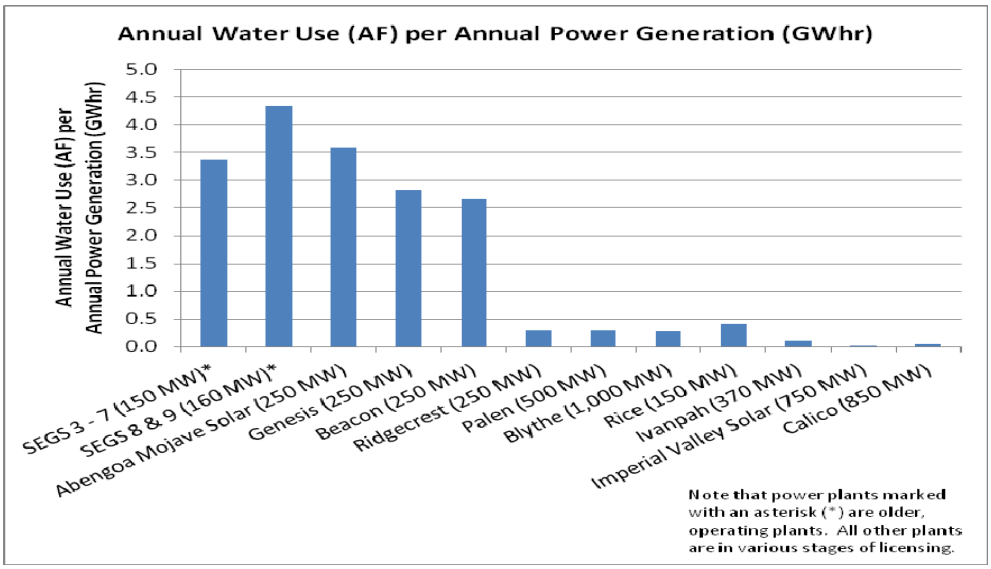
Standard requirements by providing long-term production of renewable electric energy. (See **Project Description** section of this Decision.) The record also establishes that AMS operation will be consistent with the state's GHG policies and will help achieve the state's GHG goals by causing a decrease in overall electricity system GHG emissions. (See **Greenhouse Gas Emissions** section of this Decision.)

We accept the Applicant's evidence that the use of wet cooling for this project offers the following advantage over dry cooling or wet-dry hybrid cooling: it increases production efficiency allowing a greater quantity of renewable energy to be delivered to the grid. We also accept that there appears to be no feasible alternative water supply to the proposed groundwater and implementation of the water sequestration and conservation measures adopted help ameliorate the use of groundwater for wet cooling. (See **Project Alternatives** section of this Decision.)

The evidence indicates that the project groundwater has a TDS concentration of approximately 1,200 to 1,500 mg/L. (Ex. 302, p. 5.9-40.) Under the criteria set forth in SWRCB Resolution 88-63, the quality of groundwater 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. In fact, even though these TDS concentrations are above the recommended secondary MCL of 500 mg/L and slightly above the upper secondary MCL of 1,000 mg/L, with limited treatment or with construction of a properly screened well, groundwater could possibly be used as a municipal supply. Thus, the project proposes use of slightly brackish – but treatable – groundwater.

The record shows that Staff conservatively estimates that the project will require 865 AF/y per 100 MW of capacity or 3.6-acre feet per gigawatt as a result of the wet cooling technology. (Ex. 302, p. 5.9-39.) **Soil and Water Graph 1** below shows the projects projected water use per GWH as compared to the water use of the various solar projects currently licensed by the Commission or in the licensing process.

Soil & Water Graph 1[36]
Water Use per Project per GWhr



Source: Ex. 302, p. 5.9-40.

[36] This graph reflects the Genesis project's initial proposal to use wet cooling technology. The Genesis project now proposes dry cooling technology, which is not reflected in the graph.

We note the Applicant's contention that the groundwater demand would be 2.62 acre feet per gigawatt on average. Under Staff's conservative estimate or the Applicant's more liberal estimate, the project's use of wet cooling technology will result in a significant use of water resources. We are committed to ensuring that water resources are used in the most efficient manner and find that with implementation of the sequestration and conservation measures found in Conditions of Certification **SOIL& WATER-11** and **-12,** the project will engage in significant conservation that offsets the project's water use.

The project's adjudicated water rights are critical to our determination that the project's water use can be reconciled with state water policy as it is principally **SOIL & WATER -11** that harmonizes the project's water use with state and Energy Commission water policy. The Applicant and Staff submitted extensive evidence of the Applicant's water right s under the Adjudication.[37] As discussed above, the Applicant has a BAP of 10,478 AFY but the project is limited to producing a maximum of 2,160 AFY (See Condition of Certification **SOIL&WATER-5**). The project is expected to use an average of 1,700 AFY.

The project's proposed industrial use of up to 2,160 AFY required refined calculation of the project's BAP for both agricultural and industrial use of the groundwater. In consultation with the Watermaster, Staff calculated the project's BAP and FPA as presented in **Soil and Water Table 4** below. (Ex. 306, p. 12.)

[37] We note that despite having water rights under the Adjudication, the project owner must comply with applicable LORS and use the water resources reasonably and efficiently.

Soil and Water Table 4
AMS Project's BAP and FPA

Row Number	**Abengoa Groundwater Allocation (AF/y) ***		
1	Base Annual Production (BAP) Original Consumptive Use Designation - Agricultural	10,478	
2	**BAP Consumptive Use Re-Designation**	**Industrial**	**Agricultural**
3	BAP After Consumptive Use Adjustment	5,400 = (D4 / 0.8) * 2	5,078 = D1 – D3
4	Free Production Allowance (FPA) After the Existing 20% Adjudication Ramp Down	2,160 = D5	4,062.4 = E3 * 0.8
5	Maximum AMS Project FPA Pumping	2,160	0
6	Required FPA Sequestration	0	2.160
7	FPA Available for Sequestration	0	4,062.4 = E4
8	Remaining Agricultural FPA	---	1,902.4 = E7 – E6
Column Letter	A	D	E

* Developed in consultation with the Mojave Basin Area Watermaster (Record of Conversation dated 6-15-2010, TN 57175 06-15-10 ROC)

As shown, even when the existing 20 percent ramp down is applied to the respective BAP figures, the project owns sufficient Free Production Allowance (FPA) to sequester (i.e., not pump and instead, leave in the basin) a volume of water equal to 2,160 AFY. Over the life of the AMS project, up to 60,960 acre-

feet of groundwater could be sequestered and left unused in the groundwater subbasin. The evidence of record, including the testimony of the Watermaster's agent during the June 28, 2010, hearing, indicates that the required monitoring and reporting together with the Watermaster's implementation of the Adjudication will provide further assurance of the conservation measures. (6/28/10 RT 5-49, Exs. 1, §5.17, 48, §10, 302, § 5.9, 306.)

Although the project is likely to have FPA sufficient to sequester water on a 1:1 basis (i.e., sequester water in the same amount used for the project) for the life of the project, the evidence shows that there may be some years where this ratio cannot be achieved. To address this possibility, we are requiring the Applicant to implement additional water conservation measures as set forth in Condition of Certification **SOIL&WATER-12**. Under this Condition, when the project owner is unable to sequester water, the project owner must contribute funds annually to the Mojave Water Agency (MWA) turf replacement, toilet replacement water conservation program, or similar program implemented by MWA.

Under the turf replacement program, MWA has estimated that conservation of one acre-foot of groundwater costs approximately $340. A $50,000 annual contribution to this water conservation program as it is currently administered could result in annual water savings of about 147 AFY, cumulatively increasing over the life of the AMS project. Conservation of about 147 AFY, cumulatively over the life of the AMS project, is about equal to the volume of FPA that would not be sequestered under maximum pumping conditions under the current 20 percent adjudication ramp down.

Thus, we find that with implementation of the **Conditions of Certification** discussed in this section, the project will be compliant with applicable water use LORS.

10. Agency and Public Comments

Staff received comments on the Staff Assessment from Defenders of Wildlife and Mr. Joe Ramirez.

In correspondence dated April 15, 2010, Defenders of Wildlife (Defenders) questioned whether Staff considered prior comments made by the Mojave Basin Area Watermaster, which assumed that 50 percent of irrigation water returned to the groundwater with the remaining 50 percent consumed by evapotranspiration and that the proposed project would consume 100 percent of the water it used.

Staff responded that it used the Watermaster's assumptions in its analysis as shown in **Soil & Water Table 4** of Supplemental Staff Assessment Part B.

Defenders further recommended that Staff address opportunities for overall water conservation in the basin, and consider the following: existing groundwater supplies will need to support existing and proposed renewable energy projects in the Harper Lake Basin; conservation should be linked to a goal of partial recovery of the wetland at Harper Dry Lake through groundwater connectivity rather than relying exclusively on delivering pumped groundwater to the marsh via pipeline; consider mitigation measures or alternatives such as dry cooling or hybrid cooling to allows for faster recovery of the groundwater aquifer. Staff replied that it required the Applicant to propose a water conservation plan that could be based on a suite of Staff-proposed options. The Applicant ultimately proposed a sequestration plan that would essentially limit future water use in the subbasin. More particularly, the project would sequester its FPA in an amount equal to the amount of groundwater the project pumped annually up to the amount of FPA it has in reserve. During years when the project's FPA is less than the volume of groundwater pumped by the project, the AMS project would contribute funds to a Mojave Water Agency water conservation program (up to $50,000 annually) to match the shortfall between the volume of groundwater pumped and the project's FPA available for sequestration. This plan is reflect in Staff's proposed Conditions of Certification **SOIL&WATER-11** and **-12**.

Mr. Joe Ramirez, a member of the public, was concerned that the project's proposed groundwater use would affect groundwater levels in his well. In response, Staff explained it modeling methodology and summarized the criteria for evaluating significant impacts. Staff's simulated results shows that there would be no significant impacts to groundwater levels with implementation of proposed Conditions of Certification **SOIL&WATER-5** and **SOIL&WATER-6**.

We find that Staff and the evidence of record adequately address the concerns of Defenders and Mr. Ramirez.

FINDINGS OF FACT

Based upon the evidence of record before us, we find and conclude as follows:

1. Project construction and operation has the potential to induce erosion and sedimentation, adversely affect water supplies, and degrade water quality.
2. The project will not significantly increase or decrease erosion rates with implementation of Conditions of Certification **SOIL&WATER-1** and **-2**.
3. Potential on-site drainage impacts to on-site structures, downgradient property, and the Harper Lake bed will be mitigated to insignificant levels with implementation of Conditions of Certification **SOIL&WATER-1** and **-3**.
4. The proposed use of groundwater will not significantly impact groundwater levels in existing HVGB wells, the basin balance, or the quality of groundwater in the basin.
5. The Conditions of Certification, below, are adequate to ensure that construction and operation of the AMS will comply with LORS and will not create significant adverse impacts to the matters addressed in the technical discipline of **Soils and Water Resources**.

CONCLUSION OF LAW

1. We therefore conclude that the project will conform to all applicable laws, ordinances, regulations, and standards identified in the pertinent portion of **Appendix A** of this Decision.

CONDITIONS OF CERTIFICATION

DRAINAGE EROSION AND SEDIMENTATION CONTROL PLAN (DESCP)

SOIL & WATER-1 Prior to site mobilization, the project owner shall obtain the Compliance Project Manager's (CPM) approval for a site specific DESCP that ensures protection of water quality and soil resources of the project site and all linear facilities for both the construction and operation phases of the project. This plan shall address appropriate methods and actions, both temporary and permanent, for the protection of water quality and soil resources, demonstrate no increase in off-site flooding potential, and identify all monitoring and maintenance activities. The project owner shall complete all engineering plans, reports, and documents necessary for the CPM to conduct a review of the proposed project and provide a written evaluation as to whether the proposed grading, drainage improvements, and flood management activities comply with all requirements presented herein. The plan shall be consistent with the

grading and drainage plan as required by Condition of Certification **CIVIL-1** and shall contain the following elements:

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

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

  b. Proposed Grade. Proposed grade contours shall be shown at a scale appropriate for delineation of on-site ephemeral washes, drainage ditches, and tie-ins to the existing topography. A clear indication of on-site storm water containment features (berm, etc.) should also be delineated.

  c. Hydrology. Existing and proposed hydrologic calculations for on-site areas and off-site areas that drain to the site; include maps showing the drainage area boundaries and sizes in acres, topography and typical overland flow directions, and show all existing, interim, and proposed drainage infrastructure and their intended direction of flow.

  d. Hydraulics. Provide hydraulic calculations to support the selection and sizing of the on-site drainage network, diversion facilities and BMPs.

  e. Containment. Description of on-site storm water containment features. Indicate how the project will maintain a “no discharge” status.
- **Watercourses and Critical Areas:** The DESCP shall show the location of all on-site and nearby watercourses including washes, irrigation and drainage canals, and drainage ditches, and shall indicate the proximity of those features to the construction site. Maps shall identify high hazard flood prone areas.

- **Clearing and Grading:** The plan shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross-sections, cut/fill depths or other means. The locations of any disposal areas, fills, or other special features shall also be shown. Existing and proposed topography tying in proposed contours with existing topography shall be illustrated. The DESCP shall include a statement of the quantities of material excavated at the site, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported or a statement explaining that there would be no clearing and/or grading conducted for each element of the project. Areas of no disturbance shall be properly identified and delineated on the plan maps.
- **Soil Wind and Water Erosion Control:** The plan shall describe soil treatments to be used during construction and operation of the proposed project for both road and non-road surfaces including specifically identifying all chemical based dust palliatives, soil bonding, and weighting agents appropriate for use at the proposed project site that would not cause adverse effects to vegetation; BMPs shall include measures designed to prevent wind and water erosion including application of chemical dust palliatives after rough grading to limit water use. All dust palliatives, soil binders, and weighting agents shall be approved by the CPM prior to use.
- **Project Schedule:** The DESCP shall identify on the topographic site map the location of the site-specific BMPs to be employed during each phase of construction (initial grading, project element construction, and final grading/stabilization). BMP implementation schedules shall be provided for each project element for each phase of construction.
- **Best Management Practices:** The DESCP shall show the location, timing, and maintenance schedule of all erosion- and sediment-control BMPs to be used prior to initial grading, during project element excavation and construction, during final grading/stabilization, and after construction. BMPs shall include measures designed to control dust and stabilize construction access roads and entrances. The maintenance schedule shall include post-construction maintenance of treatment-control BMPs applied to disturbed areas following construction.
- **Erosion Control Drawings:** The erosion-control drawings and narrative shall be designed, stamped and sealed by a professional engineer or erosion-control specialist.

- **Agency Comments:** The DESCP shall include copies of recommendations from the County of San Bernardino and RWQCB.
- **Monitoring Plan:** Monitoring activities shall include routine measurement of the volume of accumulated sediment in the on-site containment berms, drainage ditches, and storm water diversions. The monitoring plan shall be part of the channel maintenance plan in Condition of Certification SOIL&WATER**-3.**

Verification: The DESCP shall be consistent with the grading and drainage plan as required by Condition of Certification **CIVIL-1**, and relevant portions of the DESCP shall be submitted to the Chief Building Official (CBO) for review and approval. In addition, the project owner shall do all of the following:

1. No later than sixty (60) days prior to start of site mobilization, the project owner shall submit a copy of the DESCP to the County of San Bernardino and the RWQCB for review and comment. The CPM shall consider comments received from San Bernardino County and RWQCB and approve the DESCP based on comments as appropriate.

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

3. Once operational, the project owner shall provide in the annual compliance report information on the results of storm water BMP monitoring and maintenance activities. The project owner shall also indicate what maintenance activities were completed to maintain the project's on-site storm water flow.

4. Provide the CPM with two (2) copies each of all monitoring or compliance reports.

WASTE DISCHARGE REQUIREMENTS

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

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

Verification: No later than sixty (60) days prior to any wastewater or storm water discharge or use of land treatment units, the AMS project shall provide documentation to the CPM, with copies to the Lahontan RWQCB, demonstrating compliance with the WDRs established in Appendices C, D, and E. Any changes to the design, construction, or operation of the ponds, treatment units, or storm water system shall be requested in writing to the CPM, with copies to the Lahontan RWQCB, and approved by the CPM, in consultation with the Lahontan RWQCB, prior to initiation of any changes. The AMS project shall provide to the CPM, with copies to the Lahontan RWQCB, all monitoring reports required by the WDRs, and fully explain any violations, exceedances, enforcement actions, or corrective actions related to construction or operation of the ponds, treatment units, or storm water system.

CHANNEL MAINTENANCE PROGRAM

SOIL&WATER-3 The AMS project shall develop and implement a Channel Maintenance Program for routine maintenance of the AMS Project storm water channels. The program shall include all channel maintenance as needed to protect the integrity of the channels from erosion and sedimentation.

A. Purpose and Objectives. The program goals shall be to maintain storm water channels over the life of the project to meet their original design capacity for flood protection and conveyance and maintain groundwater recharge. Channels must have adequate capacity to convey the maximum designed flood stage flow and still maintain two feet of freeboard.

B. Channel Maintenance Area. The channel maintenance area shall be defined as the AMS project engineered channels, which would extend to the top of the channel bank and include access roads and easements on top of the banks.

C. Channel Maintenance Activities

   i. Sediment Removal. Sediment shall be removed if: (1) the effective channel flood capacity has been reduced to less than the design discharge; (2) appurtenant hydraulic structures are

prevented from functioning as intended; or (3) a permanent, non-erodible barrier to instream flows has developed.

ii. Vegetation Management. Vegetation shall be managed in and adjacent to the channels to maintain hydraulic capacity. Vegetation management shall include control of invasive and nonnative vegetation.

iii. Bank Protection and Grade Control Repairs. Bank protection and grade control structure repairs shall be conducted by the AMS project to repair eroding banks, incising toes, scoured channel beds, and as preventative erosion protection. The AMS project shall implement instream repairs when channel damage: (1) causes or could cause significant damage to the AMS project, adjacent property, or the structural elements of the channels; (2) is a public safety concern; (3) negatively affects groundwater recharge; or (4) negatively affects channel mitigation vegetation.

iv. Routine Channel Maintenance. Routine channel maintenance shall include: trash and debris removal to maintain channel design capacity; repair and installation of fences, gates and signs; and grading and other repairs to restore the original contour of access roads and levees (if applicable).

D. Channel Maintenance Plan and Reporting

1. Channel Maintenance Plan. The Channel Maintenance Plan shall include: (1) the maintenance standards for each project channel; (2) policies to guide decision-making to ensure the maintenance standards are enforced; (3) procedures and BMPs to implement to ensure implementation of the policies; and (4) procedures and BMPs for sediment management, vegetation management, trash and debris removal, fence repairs, and access road maintenance.

2. Channel Maintenance Reporting. The following plans and reports shall be submitted to the CPM each year as part of the Annual Compliance Report:

   a. Channel Maintenance Workplans. These workplans shall describe the planned “major” maintenance activities and extent of work to be accomplished.

   b. Annual Channel Maintenance Report. This report shall specify 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). This report

Verification: At least sixty (60) days before the start of project operation, the AMS project shall submit to the CPM a Channel Maintenance Plan for review and approval. The AMS project shall provide written notification to the CPM at least sixty (60) days in advance of any planned changes to the Channel Maintenance Plan.

In addition, the project owner shall:

1. Implement the Channel Maintenance Plan in Item D (Channel Maintenance Plan and Reporting);

2. Ensure that the AMS project Construction and Operations Managers receive training on the Channel Maintenance Plan; and

3. As part of the AMS project Annual Compliance Report, submit an Annual Channel Maintenance Report that specifies 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 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. A copy of the Well Completion Report shall be included in the documentation submitted to the CPM.

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 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 sixty (60) 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. The quantity of the groundwater used for project construction and operation shall be reported 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.

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 maximum daily and monthly usage in gallons per day and the total monthly and annual usage in acre-feet. Following the first year of operation, the annual summary report will summarize the annual usage in tabular form. For calculating the total water use, the term "year" will correspond to the date established for the annual compliance report submittal.

GROUNDWATER LEVEL MONITORING, MITIGATION, AND REPORTING

SOIL&WATER-6 The project owner shall submit a Groundwater Monitoring and Reporting Plan to the CPM for review and approval. This plan shall consist of two parts as defined by Conditions of Certification **SOIL&WATER-6** and **-7**. **SOIL&WATER-6** describes the requirements for establishing a groundwater well monitoring network and monitoring groundwater levels in that network. **SOIL&WATER-7** describes the

requirements for monitoring groundwater quality in the network. Mitigation for impacts related to project induced groundwater level declines or degradation in groundwater quality are provide in each condition of certification. All work and reporting under these conditions of certification shall be conducted under the supervision of a licensed California professional geologist or engineer.

The Groundwater Level Monitoring and Reporting Plan shall provide detailed methodology for monitoring background and site groundwater levels. Monitoring shall include pre-construction, construction, and project operation conditions. The primary objective for the monitoring is to establish a baseline of pre-construction groundwater level trends that can be quantitatively compared against observed and simulated trends near the project pumping wells and near potentially impacted existing wells during project construction and over the life of project operation. The project owner shall:

A. Prior to Project Construction

1. Well Reconnaissance. Conduct a well reconnaissance to investigate and document condition of existing water supply wells within the monitoring area provided access is granted by the well owner). The monitoring area shall be defined by the 20-foot contour of simulated groundwater drawdown induced by AMS project pumping at the end of the project life (as presented in Appendix B Figure Soil and Water 3). Notices shall be sent by registered mail to each well owner identified within monitoring area that provide the following information:

    a. A summary of the proposed project with an explanation of how the groundwater levels are expected to be lowered due to the AMS project groundwater pumping;

    b. An option for the well owner to be provided a copy of the Groundwater Monitoring and Report Plan as approved by the CPM and all reports prepared in compliance with the CPM-approved plan;

    c. The project owner's contact name, address, and telephone where the well owner can obtain more information; and

    d. The address and telephone number of the Energy Commission.

2. Monitoring Plan. Submit a Groundwater Level Monitoring and Reporting Plan to the CPM for review and approval at least sixty (60) days prior to construction. This plan shall include at a minimum:

a. The monitoring plan and network of monitoring wells shall make use of two of the four project production wells (once installed), all monitoring wells installed to comply with Waste Discharge Requirements for the evaporation ponds and land treatment unit associated with the project, and the BLM marsh water supply well. In addition, and at least three additional existing wells in the Harper Lake area shall be incorporated into the program. The final well selection shall be based on access being granted by the owners and by BLM and that the wells are deemed by the CPM to be of suitable location and construction to satisfy the requirements for the monitoring program. Some Harper Lake area wells are already monitored, and these wells can be included as part of the network if they meet the objectives of the monitoring program.

b. A scaled map showing the project site, boundary, location of all wells within the monitoring area, and location of wells selected for the monitoring network. The map shall also include relevant natural (e.g., faults, playa lake, etc.) and man-made features that are existing and proposed as part of the AMS project.

c. Available well construction information, drilling and well installation methods, and borehole lithology for all wells in the monitoring area.

d. For monitoring network wells, report the results of a wellhead elevation survey that record: the location and elevation of the well; the location and elevation of the top of the well casing reference point for all water level measurements (the measurement point); and the coordinate system and datum for the survey measurements.

e. A description of how groundwater measurements will be collected and reported. All groundwater level measurements shall be made to the nearest **1/100 of a foot**.

f. A description of the groundwater level measurements and reporting protocols and quality assurance/quality control plan.

g. Information about the AMS project wells shall be added to a revised plan submitted to the CPM for review and approval within sixty (60) days after the project wells are installed.

h. A description of the reporting requirements presented below, including a statistical analyses conducted on the data collected, the thresholds employed to determine impact

i. A schedule for measuring water levels in all wells in the monitoring network.

j. The plan shall be signed and stamped by a licensed California professional geologist or engineer.

3. Monitoring. Before the start of project construction, collect groundwater levels from all existing wells within the monitoring network, in accordance with the requirements in the Groundwater Level Monitoring and Reporting Plan, to establish pre-construction conditions.

4. Reporting. A report documenting the pre-construction monitoring results shall be submitted to the CPM after measuring groundwater levels in network wells. At a minimum, the report shall contain: a tabular summary of the network wells; the water level measurements; and dates of the water level measurements; diagrams showing water levels in the wells over time (hydrographs); a map of groundwater elevation contours and calculated gradients; and conclusions regarding groundwater level trends and recommendations for future monitoring and the likelihood of potential interferences to existing wells made by a licensed California professional geologist or engineer.

B. During Construction:

5. Collect groundwater levels within the monitoring network on a quarterly basis throughout the construction period. Perform statistical trend analysis for groundwater levels data using linear regression or a non-parametric test such as Kendall-Theil Robust Line, or other appropriate statistical analysis. Assess the significance of apparent trends using appropriate statistical analysis and compare to observed background trends in other monitored wells in the sub-basin.

6. After measuring groundwater levels in network wells, submit to the CPM a report of pre-project groundwater levels, present a summary of available climatic information (monthly average temperature and rainfall records from the nearest weather station), and provide a comparison and assessment of water level data relative to the spatial trends simulated by the USGS Mojave River Basin Model (USGS2001). This report shall also contain a tabular summary of the wells, current and historical water level measurements, and dates of water level measurements; a map of the groundwater elevation contours

and calculated gradients; and conclusion and recommendations of a licensed California professional geologist or engineer.

C. During Operation:

7. On a quarterly basis for the first year of operation and semi-annually thereafter for the following four years, collect groundwater level measurements from all wells identified in the groundwater monitoring network. Quarterly operational parameters (i.e., pumping rate and days on which pumping occurred) of the groundwater supply wells shall be monitored.

8. On an annual basis, perform statistical trend analysis (using linear regression or a non-parametric test such as Kendall-Theil Robust Line, or other appropriate statistical analysis) on water levels, compare water levels and trends to pre-project conditions, present a summary of available climatic information (monthly average temperature and rainfall records from the nearest weather station), and provide a comparison and assessment of water level data relative to the assumptions and spatial trends simulated by the USGS Mojave River Basin Model (USGS2001). The magnitude and significance of any trends shall be evaluated. Based on comparisons between pre-project, project, and background water level trends, **the project owner shall estimate the groundwater level change attributed to project pumping.** These calculations shall be supported using a tabular summary of the wells, current and historical water level measurements, a map of the groundwater elevation contours; calculated gradients; and conclusion and recommendations of a licensed California professional geologist or engineer.

D. Mitigation:

9. If groundwater levels have been lowered more than 20 feet below pre-construction levels in an offsite well and monitoring data indicates the water level decline is attributed to project pumping, then the project owner shall assess the impact to the water column above the pump and well screen and related impact to well yield.

10. Mitigation shall be provided to well owners that experience 20 feet or more of project-induced drawdown if well monitoring data confirms project pumping **causes all or a portion of the drawdown and either the previously submerged well screen has been exposed or the well yield or performance has been reduced such that the well fails to meet demand.** The type and extent of mitigation shall be determined by the amount of water level decline induced by the project, the type of impact, and site specific well construction and water use characteristics.

If an impact is determined to be caused by drawdown from more than one source, the level of mitigation provided shall be proportional to the amount of drawdown induced by the project relative to other sources. In order to be eligible, a well owner must provide documentation of the well location and construction, including pump intake depth, and evidence that the well was constructed in use before project pumping was initiated. The mitigation of impacts shall be determined as follows:

a. Increased Electrical Usage. If project pumping has lowered a well's water levels and increased pumping lifts, increased energy costs shall be calculated. Payment or reimbursement for the increased costs shall be provided at the option of the affected well owner. In the absence of specific electrical use data supplied by the well owner, the following formula shall be used to calculate the additional electrical usage:

Increased Cost for Energy	=	(change in lift/total hydraulic head) x (total energy consumption times costs/unit of energy)

Where:

change in lift (ft)	=	calculated change in water level in the well
total hydraulic head (ft)	=	(elevation head) + (discharge pressure head)
elevation head (ft)	=	(wellhead discharge pressure gauge elevation) – (water level elevation in well during pumping)
discharge pressure head (ft)	=	(pressure in pounds per square inch at wellhead discharge gauge) x (2.31 to convert psi to feet of water)

The project owner shall submit to the CPM for review and approval the documentation showing which well owners must be compensated for increased energy costs and that the proposed amount is sufficient compensation to comply with the provisions of this condition.

i. Any reimbursements (either lump sum or annual) to impacted well owners shall be only to those well owners whose wells were in service within six months

of the Commission decision and within the 20-foot contour interval established in Item A above.

ii. The project owner shall notify all owners of the impacted wells within one month of the CPM approval of the compensation analysis for increase energy costs.

iii. Compensation shall be provided on either a one-time lump-sum basis, or on an annual basis, as described below.

Annual Compensation. Compensation provided on an annual basis shall be calculated prospectively for each year by estimating energy costs that will be incurred to provide the additional lift required as a result of the project. With the permission of the impacted well owner, the project owner shall provide energy meters for each well or well field affected by the project. The impacted well owner to receive compensation must provide documentation of energy consumption in the form of meter readings or other verification of fuel consumption. For each year after the first year of operation, the project owner shall include an adjustment for any deviations between projected and actual energy costs for the previous calendar year.

One-Time Lump-Sum Compensation. Compensation provided on a one-time lump-sum basis shall be based on a well-interference analysis, assuming the maximum project-pumping rate of 2,160 AF/y. Compensation associated with increased pumping lift for the life of the project shall be estimated as a lump sum payment as follows:

i. The current cost of energy to the affected party considering time of use or tiers of energy cost applicable to the party's billing of electricity from the utility providing electric service, or a reasonable equivalent if the party independently generates their electricity;

ii. An annual inflation factor for energy cost of 3 percent; and

iii. A net present value determination assuming a term of 30 years and a discount rate of 9 percent;

b. Well Screen Exposure. If groundwater monitoring data indicate project pumping has lowered water levels below the top of the well screen, and the well yield is shown no longer meet pre-project demand, compensation shall be provided to

diagnose and treat ~~and~~ well screen encrustation. Reimbursement shall be provided at an amount equal to the customary local cost of performing the necessary diagnosis and maintenance for well screen fouling. Should well yield reductions reoccur, the project owner shall provide payment or reimbursement for either periodic maintenance throughout the life of the project or replacement of the well.

c. Well Yield. If project pumping has lowered water levels to significantly impact well yield so that it can no longer meet its intended purpose, causes the well to go dry, or cause casing collapse, payment or reimbursement of an amount equal to the cost of deepening or replacing the well shall be provided to accommodate these effects. Payment or reimbursement shall be at an amount equal to the customary local cost of deepening the existing well or constructing a new well of comparable design and yield (only deeper). The demand for water, which determines the required well yield, shall be determined on a per well basis using well owner interviews and field verification of property conditions and water requirements compiled as part of the pre-project well reconnaissance. Well yield shall be considered significantly impacted if it is incapable of meeting 100 percent of the well owner's maximum daily demand and 5-year average annual demand – assuming the pre-project well yield documented by the initial well reconnaissance met or exceeded these yield levels. The contribution of project pumping to observed decreases in observed well yield shall be determined by interpretation of the groundwater monitoring data collected and shall take into consideration the effect of other nearby pumping wells, basin-wide trends, and the condition of the well prior to the commencement of project pumping.

d. The project owner shall notify any owners of the impacted wells within one month of the CPM approval of the compensation analysis.

e. Pump Lowering. In the event that groundwater is lowered as a result of project pumping to an extent where pumps are exposed but well screens remain submerged, the pumps shall be lowered to maintain production in the well. The project shall reimburse the impacted well owner for the costs associated with lowering pumps in proportion to the project's contribution to the lowering of the groundwater table that resulted in the impact.

f. Deepening of Wells. If the groundwater is lowered enough as a result of project pumping that well screens and/or pump intakes are exposed, and pump lowering is not an option,

such affected wells shall be deepened or replacement wells constructed. The project shall reimburse the impacted well owner for all costs associated with deepening existing wells or constructing replacement wells in proportion to the project's contribution to the lowering of the water table that resulted in the impact.

E. Monitoring Program Evaluation:

11. After the first five-year operational and monitoring period, and every subsequent 5-year period, the CPM shall evaluate the data and determine if the monitoring program water level measurement frequencies should be revised or eliminated. Revision or elimination of any monitoring program elements shall be based on the consistency of the data collected.

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

1. At least sixty (60) days prior to project construction, the project owner shall submit to the CPM, for review and approval, a comprehensive plan (Groundwater Level Monitoring and Reporting Plan) presenting all the data and information required in Item A above. The project owner shall submit to the both the CPM all calculations and assumptions made in development of the plan.
2. During project construction, the project owner shall submit to the CPM quarterly reports presenting all the data and information required in Item B above. The project owner shall submit to the CPM all calculations and assumptions made in development of the report data and interpretations.
3. No later than sixty (60) days after commencing project operation, the project owner shall provide to the CPM, for review and approval, documentation showing that any mitigation to private well owners during project construction was satisfied, based on the requirements of the property owner as determined by the CPM.
4. During project operation, the project owner shall submit to CPM, applicable quarterly, semi-annual, and annual reports presenting all the data and information required in Item C above. The project owner shall submit to the CPM all calculations and assumptions made in development of report data and interpretations, calculations, and assumptions used in development of any reports.
5. The project owner shall provide mitigation as described in Item D above, if the CPM's inspection of the monitoring information confirms project-induced changes to water levels and water level trends relative to measured pre-project water levels, and well yield has been lowered by project pumping. The type and extent of mitigation shall be determined by the amount of water level decline and site-specific well construction and water use characteristics. The mitigation of impacts will be determined as set forth in Item D above.

6. No later than 30 days after CPM approval of the well drawdown analysis, the project owner shall submit to the CPM for review and approval all documentation and calculations describing necessary compensation for energy costs associated with additional lift requirements.
7. The project owner shall submit to the CPM all calculations, along with any letters signed by the well owners indicating agreement with the calculations, and the name and phone numbers of those well owners that do not agree with the calculations.
8. If mitigation includes monetary compensation, the project owner shall provide documentation to the CPM that compensation payments have been made by March 31 of each year of project operation or, if a lump-sum payment is made, payment shall be made by March 31 of the following year. Within 30 days after compensation is paid, the project owner shall submit to the CPM a compliance report describing compensation for increased energy costs necessary to comply with the provisions of this condition.
9. After the first 5-year operational and monitoring period, and every subsequent 5-year period, the project owner shall submit a 5-year monitoring report to the CPM for review and approval. This report shall contain all monitoring data collected and provide a summary of the findings and a recommendation about whether the frequency of water level measurements should be revised or eliminated.
10. During the life of the project, the project owner shall provide to the CPM all monitoring reports, complaints, studies, and other relevant data within 10 days of being received by the project owner.

GROUNDWATER QUALITY MONITORING, MITIGATION, AND REPORTING

SOIL&WATER-7 A water quality baseline of pre-construction conditions shall be established for all wells in the monitoring network established by Condition of Certification **SOIL&WATER-6**, including all monitoring wells that are installed to comply with Waste Discharge Requirements for the evaporation ponds and land treatment unit associated with the project, the existing BLM well and any retrofitted or newly installed BLM marsh water supply well. The primary objectives for the monitoring is to establish pre-construction and project related groundwater quality impacts that can be quantitatively evaluated to avoid, minimize, or mitigate significant adverse impacts to wells in the network from potential degradation in the quality of groundwater.

A. Plan. The project owner shall submit a Groundwater Quality Monitoring and Reporting Plan to the CPM for review and approval at least sixty (60) days prior to project construction. The Groundwater Quality Monitoring and Reporting Plan shall be a part of the Groundwater Monitoring and Reporting Plan required under

Condition of Certification **SOIL&WATER-6**, and shall include at a minimum:

1. A compilation of historical water quality data that can be used to establish baseline water quality conditions and compare with project water quality monitoring.

2. Where insufficient historical water quality data is available, identify additional sampling and analysis that will be completed prior to project construction to establish pre-project trends in water quality.

3. A description of the methodology for monitoring background and groundwater quality in all wells that are within the monitoring network established in Condition of Certification **SOIL&WATER-6**.

4. A description of the water quality analysis to be conducted on water samples collected from each well in the monitoring network. This description will include the purpose of each water quality analysis.

5. A description of the groundwater sample collection method for each analysis to be performed.

6. A description of the quality assurance/quality control that will be built into the sample collection and reporting protocol.

7. A description of the reporting requirements presented below, including a statistical analyses that will be performed on the data collected and a description of the mitigation that would be required for significant water quality impacts.

8. A schedule for monitoring all wells in the monitoring network.

B. Report During Pre-Construction. At least sixty (60) days prior to project construction, all groundwater quality monitoring data shall be submitted to the CPM for review and approval. The report shall include the following:

9. An 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.

10. 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.

11. The data shall be tabulated, summarized, and submitted to the CPM for review and approval. 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.

C. Monitor. During project construction and operation, the project owner shall semi-annually monitor the quality of groundwater semi-annually. The monitoring shall include:

12. Collection of groundwater samples from all monitoring network wells and analysis of these samples for TDS, chloride, nitrates, cations and anions, and oxygen-18 and deuterium isotopes. The BLM marsh water supply well shall also be analyzed for sodium and selenium. 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.

D. Reporting During Construction and Operation. During project construction and operation, the project owner shall submit water quality reports semi-annually to the CPM and BLM. The groundwater quality data shall be tabulated, summarized, and analyzed to compare water quality to pre-project conditions. This analysis shall include analyses of trends and for contrast with the pre-project data as follows:

13. Water quality trends shall be analyzed using the Mann-Kendall test. Trends in the data shall be compared and contrasted to pre-project trends, if any.

14. If no significant water quality trends exist in the water quality data or the data set is insufficient to assess trends, the water quality data shall be combined for each well and contrasted to the pre-project well water quality data set.

15. The contrast between pre-project and water quality 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.

16. If based on the water quality data the CPM and BLM determines that the quality of the water produced by the marsh water-supply well has been impacted by project pumping (exceeds pre-project constituent concentrations in TDS, chloride, nitrates, sodium, or selenium concentrations for three consecutive years) such that the water quality adversely affects the well's intended purpose, the project owner shall provide treatment or a new water supply to either meet or exceed pre-project water quality conditions.

E. Monitoring Program Evaluation. After the first five-year operational and monitoring period, and every subsequent 5-year period, the CPM shall evaluate the data and determine if the groundwater quality data collection frequencies and constituent list monitored should be revised or eliminated. Revision or elimination of any monitoring program elements shall be based on the consistency of the data collected.

Verification: The project owner shall complete the following:

1. At least sixty (60) days prior to construction, a Groundwater Quality Monitoring and Reporting Plan in compliance with Item A shall be submitted to the CPM for review and approval.

2. At least thirty (30) days prior to the start of construction, a pre-construction groundwater quality report in compliance with Item B shall be submitted to the CPM for review and approval.

3. Semi-annually, by March 31 and September 31, the project owner shall submit Groundwater Quality Reports in compliance with Item D to the CPM for review and approval and to the BLM for review.

4. After the first 5-year operational and monitoring period, and every subsequent 5-year period, the project owner shall submit a 5-year monitoring report to the CPM, for review and approval, that contains all groundwater quality data

collected and provides a summary of the findings and a recommendation about whether the frequency of groundwater quality data collection should be revised or eliminated.

5. During the life of the project, the project owner shall provide to the CPM all monitoring reports, complaints, studies, and other relevant data within 10 days of being received by the project owner.

WASTEWATER COLLECTION SYSTEM REQUIREMENTS

SOIL&WATER-8 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. All records of this testing and classification shall be maintain at the project site. 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-9 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

simultaneously 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.

NON-TRANSIENT, NON-COMMUNITY WATER SYSTEM

SOIL&WATER-10: The Project is subject to the requirement of Title 22, Article 3, Sections 64400.80 through 64445 for a non-transient, non-community water system (serving 25 people or more for more than six months). Pursuant to this requirement, the project owner shall obtain a permit from the County of San Bernardino to operate a non-transient, non-community water system.

Verification: The project owner shall obtain a permit to operate a non-transient, non-community water system with the County of San Bernardino at least sixty (60) days prior to commencement of construction at the site. The project owner shall supply updates annually for all monitoring requirements and submittals to County of San Bernardino related to the permit, and proof of annual renewal of the operating permit.

SOIL&WATER-11 As a conservation method, the project owner shall annually sequester a volume of Free Production Allowance (FPA) equal to the annual volume of groundwater pumped for the AMS project. This sequestration is subject to and defined by the following:

- The project owner shall exercise all option rights indentified in the AFC and thereby acquire groundwater Base Annual Production rights totaling 10,478 AF/y.
- Sequester means that the project owner retain and refrain from exercising groundwater FPA use rights which the project owner could exercise under the Mojave Basin Area Adjudication.
- The project owner shall sequester annually a volume of groundwater equal to that year's volume of groundwater used for the AMS project, up to a maximum annual volume of 2,160 acre-feet.
- Sequestration shall continue annually for the life of the project.
- The annual sequestration of FPA is not intended to affect the Watermaster's implementation of the Mojave Basin Area Adjudication.
- Sequestered water would not be considered by the Energy Commission to be produced water subject to any replacement water obligation under the Mojave Basin Area Adjudication.

Verification: The volume of FPA sequestered shall be documented in the Annual Compliance Report submitted to the CPM and Watermaster. This documentation shall include a table showing the annual and cumulative total FPA sequestered.

SOIL&WATER-12 Under conditions stated below, the project owner may be required to contribute up to $50,000 annually, for the life of the AMS project, towards the Mojave Water Agency's (MWA) turf replacement program, high-efficiency toilet program, or other water conservation program as approved by the CPM. This condition serves as a conservation measure.

The project owner's contribution to the MWA conservation program shall be an amount necessary to conserve groundwater equal in volume to the difference between the annual AMS project's water use and annual groundwater sequestered. If the project owner demonstrates that the annual or cumulative water sequestered equals or exceeds project water use, then no contribution to the MWA conservation program is required. Within the $50,000 limit, the project owner shall ensure that the amount contributed to the water conservation program is adjusted on an annual basis to maintain the required amount of water conservation. The contribution shall be made the same month each year as established by the first year's contribution.

If the project owner proposes to change or add water conservation programs that can be funded for the purposes of this condition, a plan must be provided showing which programs are proposed, how much water savings can be achieved, and how much funding is proposed. The plan shall be provided for CPM review and approval in consultation with the Mojave Water Agency prior to the proposed date of change in water conservation programs.

Verification: The project owner shall do the following:

1. The project owner shall submit to the CPM the following documentation as part of the Annual Compliance Report:
    a. A copy of the receipt from the MWA for the annual contribution; and
    b. An accounting of the following:
        i. The annual and cumulative volume of groundwater used by the project in acre-feet per year;
        ii. The annual and cumulative volume of FPA sequestered by the project in acre-feet per year;
        iii. The numerical difference between annual and cumulative totals in Items i and ii above; and

iv. The annual and cumulative monetary contribution and estimated annual and cumulative volume of water conserved by the project owner's contribution to MWA's turf replacement program, high-efficiency toilet program, or other water conservation program approved by the CPM.

2. If the project owner proposes to reduce the amount of the annual contribution based on the water conservation achieved through previous contributions, the project owner shall provide a plan demonstrating how the adjusted amount will ensure the water conservation program meets the requirements of this condition. The plan shall be provided for CPM review and approval 60 days prior to the annual contribution anniversary date.

SOIL AND WATER RESOURCES – ATTACHMENT A

FACTS FOR WASTE DISCHARGE REQUIREMENTS

1. REASON FOR ACTION AND REGULATORY AUTHORITY

The Discharger submitted a Report of Waste Discharge/Joint Technical Document (hereafter collectively referred to as the RWD) with the California Energy Commission (Energy Commission) and Lahontan Regional Water Quality Control Board (Lahontan Water Board). The Energy Commission will coordinate reviews and approvals with the regulatory agencies to ensure that the proposed project meets the California Environmental Quality Act (CEQA) requirements and conforms with the Porter-Cologne Water Quality Control Act. The Energy Commission will certify this project and has included waste discharge requirements (WDRs) as conditions of certification in accordance with the Warren-Alquist Act[38]. The WDRs are not being proposed by staff of the Regional Board to its Board for consideration and adoption at this time. Once the Energy Commission certifies the proposed project, the Board of the Lahontan Water Board under Section 13263 of the Water Code may prescribe these requirements as WDRs solely for the purpose of enforcement, annual fee collection, inspection and monitoring, and related purposes, but any action of the Board of the Regional Board under Section 13263 of the Water Code must be consistent with the Warren-Alquist Act, including without limitation the non-reviewability provision of subdivision (c) of Section 25531 of the Public Resources Code.

The Applicant filed an Application for Certificate (AFC) with the Energy Commission in July 2009. The applicant is proposing the construction and operation of a 250-megawatt (MW) solar power plant from twin, independently-operable solar fields, each feeding a 125-MW power island.

Under the Warren-Alquist Act, and Governor's Executive Order S-14-08, the Energy Commission has the authority to streamline permitting for renewable energy generation facilities. The Energy Commission implements this "in lieu of" process by incorporating the regulatory requirements and conditions of the various local and State agencies in its certification process. All necessary State and local permits for this Facility, including those permits

[38] The Warren-Alquist State Energy Resources Conservation and Development Act is the enabling legislation for the California Energy Commission. The Act is codified as Public Resources Code (PRC), Section 25000 et seq. PRC Section 25500 establishes the Commission's authority to certify all sites and related facilities for thermal power plants with power ratings of 50 megawatts or more. The section further declares that "the issuance of a certificate by the commission shall be in lieu of any permit, certificate, or similar document required by any state, local or regional agency, or federal agency to the extent permitted by federal law, for such use of the site and related facilities, and shall supersede any applicable statute, ordinance, or regulation of any state, local, or regional agency, or federal agency to the extent permitted by federal law."

typically issued by the Water Board, can be issued to the applicant through the Energy Commission's certification process.

In a February 26, 2010 letter, the U.S. Army Corps of Engineers (USACE) determined that the ephemeral drainages on the site are not waters of the United States (U.S.). However, the drainages affected by the Facility are waters of the State, as defined by California Water Code (Water Code) section 13050, and are subject to State requirements in accordance with Water Code section 13260 and to the Water Quality Control Plan for the Lahontan Region (Basin Plan). All actions impacting or potentially impacting these drainages, construction and industrial activities, will be regulated through these requirements, which will be incorporated in the Energy Commission's certification process.

2. WASTE DISCHARGE REQUIREMENTS HISTORY

The Facility is a new project. There are no previous Lahontan Water Board actions at this Facility or location. These requirements for waste discharge address storm water and groundwater requirements for the Facility.

3. CLIMATE

The Mojave Desert has a typical desert climate, i.e., extreme daily temperature changes, low annual precipitation, strong seasonal winds, and mostly clear skies.
The annual highest temperature in the Mojave Desert exceeds 100 degrees Fahrenheit. Winter temperatures are more moderate, with mean maximum temperatures in the 60s and lows in the 30s.

Nearby City of Barstow has a total average annual precipitation of less than 6 inches. Over 70% of the precipitation occurs between December and March. However, occasional heavy precipitation occurs in the summer due to thunderstorms.

4. SITE GEOLOGY

A. Setting

The Facility is located in Harper Valley at the northwest edge of the Mojave Desert Geomorphic Province. Shallow deposits consist of Holocene (11,000 years and younger) alluvium, lacustrine, and playa deposits. Deeper deposits consist of older alluvium. The Holocene and older alluvium are comprised of mixtures, layers, and lenses of silt, sand, and gravel. The lacustrine and playa deposits are generally finer grained, consisting of sands, silts, and clays. These deposits overlie igneous or metamorphic basement rocks at depth. The elevation of the Facility ranges from 2,010 feet to 2,020 feet above mean sea level.

B. Faulting and Seismicity

The Facility is located in a seismically active region of southern California and within the influence of several active fault systems (northeast-trending Garlock fault to the north and the northwest-trending San Andreas Fault to the south). The northwest-trending Lenwood-Lockhart-Old Woman Springs fault is located approximately 2,300 feet southwest of the Facility.

C. Soils

Most of the Facility is covered by soil types that have rapid (i.e., high) permeability and negligible to low runoff potential. The exceptions are areas underlain by clay loams, which have moderate runoff potential and moderate to moderately slow permeability (i.e., low permeability). Clay loam soils are present in the northeast portion of the Facility and are slightly to moderately saline.

5. GROUNDWATER

The Facility is located in the central portion of the Harper Valley groundwater basin (Department of Water Resources [DWR] groundwater basin No. 6-47). The Harper Valley groundwater basin is divided into several subbasins based on the presence of bedrock barriers and faults that influence groundwater movement.

The Facility site overlies the Harper Lake groundwater sub-basin. Depth to perched groundwater is approximately 50 feet below ground surface (bgs) in the vicinity of Harper Lake. Depth to the regional groundwater table measured at the Facility ranged from approximately 150 to 170 feet below ground surface. Since agriculture use ceased in the 1980s, groundwater levels are slowly recovering. A groundwater depression still exists in the northeastern portion of the site. The groundwater flow direction in the sub-basin is generally toward Harper Lake. The primary source of water to the groundwater basin is from surface infiltration at the base of the mountains and in ephemeral washes. Additionally, there may be some groundwater flow into the Harper Lake subbasin from the adjacent subbasins.

In accordance with State Water Resources Control Board (State Water Board) Resolution No. 75-58, *Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling* and Resolution No. 77-01, *Policy with Respect to Water Reclamation in California*, the applicant has evaluated alternative water sources for Facility operation.

In the vicinity of Harper Lake, some groundwater wells produce water with total dissolved solids (TDS) greater than 1,500 milligrams per liter.

6. SURFACE WATER

Surface water flow in Harper Valley is to Harper Lake, a saline wet playa. The playa is a flat, unvegetated area in the lowest part of this undrained valley. All drainages in this portion of the valley exist as ephemeral washes.

7. LAND USES AND EXISTING SITE CONDITIONS

The approximately 1,765-acre site is on previously disturbed fallow agricultural land.

8. STORM WATER DISCHARGES

Under pre-development conditions, the Facility site has a low gradient (between 1 and 3%) and storm water moves via sheet flow to Harper Lake.

The following requirements regulate waste discharges in storm water runoff and other discharges associated with Facility construction activity and industrial storm water runoff.

A. Construction Storm Water Management

The applicant estimates that the construction phase will last six months, during which time the entire Facility site would be regraded and an unnamed wash will be rerouted and channelized. Site drainage would be managed in accordance with the best management practices (BMPs) as described in the Drainage, Erosion, and Sediment Control Plan (DESCP) and Final Storm Water Pollution Prevention Plan (SWPPP) to be prepared by the project owner in accordance with these WDRs (see Soil and Water Appendix D).

The applicant has proposed a channel design that would convey the 100-year flood event (21,232 cubic feet per second) between the northern (Alpha) field and southern (Beta) field without overtopping the banks. The channel will redirect flows to Harper Lake.

B. Post-Construction Storm Water Management

The applicant proposes to manage storm water, erosion and sedimentation at the completed Facility through a comprehensive system of source controls, treatment BMPs, and site design. At a minimum, the applicant proposes to adhere to San Bernardino County's detention and retention requirements.

Onsite storm water would be contained onsite. Offsite flow in the unnamed wash would be conveyed across the site, without any input from onsite flows, and discharged into Harper Lake. The power block would drain via sheet flow away from equipment foundations to the solar field. Good housekeeping and prompt removal of spills and leaks would be implemented to minimize storm water contact with contaminated materials.

9. RECEIVING WATERS

The receiving waters are the minor surface waters of the Lockhart Hydrologic Area (Hydrologic Subunit 628.42) and groundwaters of the Harper Valley Ground Water Basin (DWR No. 6-47).

10. LAHONTAN BASIN PLAN

The Lahontan Water Board adopted a Water Quality Control Plan for the Lahontan Basin (Basin Plan), which became effective on March 31, 1995. These Facts, Requirements, and Monitoring and Reporting for Groundwater implement the Basin Plan.

11. BENEFICIAL USES -SURFACE WATERS

The Basin Plan designates beneficial uses for surface waters in each watershed of the Lahontan region. Beneficial uses of surface waters within the Facility area and vicinity that could be impacted by the Facility include:

a. Municipal and Domestic Water Supply (MUN)

b. Agricultural Supply (AGR)

c. Groundwater Recharge (GWR)

d. Flood Peak Attenuation/Flood Water Storage (FLD)

e. Water Contact Recreation (REC-1)

f. Non-Contact Water Recreation (REC-2)

g. Warm Freshwater Habitat (WARM)

h. Cold Freshwater Habitat (COLD)

i. Wildlife Habitat (WILD)

j. Water Quality Enhancement (WQE)

12. BENEFICIAL USES -GROUNDWATERS

The Basin Plan designates beneficial uses for groundwaters in each watershed of the Lahontan region. Beneficial uses of groundwaters within the Facility area and vicinity that could be impacted by the Facility include:

a. Municipal and Domestic Water Supply (MUN)

b. Agricultural Supply (AGR)

c. Industrial Surface Supply (IND)

d. Freshwater Replenishment (FRSH)

13. NON-DEGRADATION

The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 (*Statement of Policy with Respect to Maintaining High Quality of Waters in California*). Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings or facts. The Basin Plan implements, and incorporates by reference, state antidegradation policies. The permitted discharge is consistent with the antidegradation provision of Resolution No. 68-16 because either the permitted discharge will not be released into the environment or because adherence to these requirements will result in minor, if any, adverse impacts to water quality.

In accordance with State Water Board Resolution No. 68-16 and the Basin Plan, the following conditions must be met prior to any degradation of water of the State:

a. *Any change in water quality must be consistent with maximum benefit to the people of the State;*

b. *The degradation will not unreasonably affect present and anticipated beneficial uses;*

c. *The degradation will not result in water quality less than that prescribed in the Basin Plan;*

d. *Discharges must use the best practicable treatment or control to avoid pollution or nuisance and maintain the highest water quality consistent with maximum benefit to the people of the State.*

14. OTHER CONSIDERATIONS AND REQUIREMENTS FOR DISCHARGE

Pursuant to Water Code section 13241, these requirements take into consideration:

a. *Past, present, and probable future beneficial uses of water*.

These requirements identify past, present and probable future beneficial uses of water as described in Facts Nos. 11 and 12. The proposed discharge will not adversely affect present or probable future beneficial uses of water, including domestic water supply, agricultural supply, industrial supply, and freshwater replenishment.

b. *Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto*.

Facts Nos. 3 through 8 describe the environmental characteristics and quality of water from this hydrographic unit.

c. *Water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect water quality in the area.*

These requirements will not result in any significant changes to groundwater quality. Adverse effects to surface water quality will be minimized.

d. *Economic considerations*.

These requirements authorize the applicant to implement closure and post-closure maintenance actions at the Facility as proposed by the applicant. These requirements accept the applicant's proposed actions as meeting the best practicable control method for protecting water quality from impacts from the Facility.

e. *The need for developing housing within the region*.

The Discharger is not responsible for developing housing within the region.

f. *The need to develop and use recycled water*.

The Energy Commission and the applicant are evaluating the feasibility of using recycled water as the water source for Facility operations.

SURFACE IMPOUNDMENTS

15. DESCRIPTION OF SURFACE IMPOUNDMENTS (EVAPORATION PONDS)

The four proposed surface impoundments would be lined evaporation ponds used for disposal of process wastewater generated primarily as spent cooling water and process water. The surface impoundments would be waste management units. The anticipated total dissolved solids (TDS) concentration of the wastewater is approximately 60,000 milligrams per liter (mg/L). Wastewaters would be co-mingled in the surface impoundments, which provide a combined evaporation surface of approximately 20 acres (four surface impoundments each with a nominal surface area of five acres). The collective operating capacity of the surface impoundments would be designed to accommodate an annual discharge rate of 24 gallons per minute (0.035 million gallons per day).

Saturated or equilibrium concentrations of impounded wastewaters result in precipitation of solids out of solution. For safety and operational purposes, accumulated solids would be to be removed from the surface impoundments when the solids reach a depth of two feet above the bottom of the impoundment. The surface impoundments must be designed to contain the 1,000-year, 24-hour precipitation storm event (pursuant to California Code of Regulations (CCR), title 27, section 20310) while maintaining the mandatory 2-foot freeboard requirement.

16. SURFACE IMPOUNDMENTS CONSTRUCTION DESIGN

The proposed design for the four surface impoundments, from the surface downwards, consists of the following:

a. A hard surface/protective layer with granular fill/free draining sub-base over geotextile;

b. A primary 60-mil high-density polyethylene (HDPE) liner;

c. An interstitial leak detection and removal system (LDRS) comprising a geomembrane geonet and collection piping;

d. A secondary 40-mil HDPE liner; and

e. A base layer consisting of one foot of onsite screened soil below the lower liner, which contains no particles larger than one-quarter inch and which is compacted to 95% of the maximum dry density per ASTM D1557, or a 6-inch sand layer to prevent punctures.

f. A leak detection system consisting of continuous carrier pipes installed at the sides and low point of each surface impoundment at a depth of approximately five feet below the secondary liner. A neutron probe will be pulled through the pipes to assess the moisture content of the vadose soil. The background moisture content, and subsequent approved action level that will indicate a leak, will be established after the surface impoundments have been constructed, but prior to any liquids being placed in the surface impoundments.

17. LEACHATE COLLECTION AND REMOVAL SYSTEM (LCRS)

In accordance with CCR, title 27, section 21600, subdivision (b)(8)(C), there is an LCRS proposed to be located beneath the primary liner in the surface impoundment. Additionally, an LCRS would be located between the primary and secondary liners underlying each surface impoundment. The LCRS consists of a layer of geonet sloped to a leak detection sump in each surface impoundment. The leak detection sump would include a 16-inch diameter leak-detection-and-removal-well fitted with an electronic leak sensor and a submersible pump to allow removal of collected fluids. The pump would discharge back into the surface impoundment. The discharge pipe shall be equipped with a recording flow totalizer to allow monitoring of the amount of fluid removed over time and calculation of leakage rates. The inspection and maintenance requirements for the LCRS are outlined in the April 2010 Report of Waste Discharge (ROWD).

18. ACTION LEAKAGE RATE OF SURFACE IMPOUNDMENT LINERS

The Action Leakage Rate (ALR) is the allowable leakage from the primary liner system above which spill prevention, control, and countermeasure (SPCC) plan actions are triggered (April 2010 ROWD). According to Code of Federal Regulations, title 40, section 264.222, the ALR is defined as "…the maximum design flow rate that the leak detection system can remove without the fluid head on the bottom liner exceeding 1 foot." The ALR must also include an adequate safety margin to allow for variability in the containment system design (e.g. liner and collection pipe slope, interstitial

fill hydraulic conductivity, thickness of drainage material, etc.). The estimated ALR for the surface impoundments, as documented in the April 2010 ROWD, is 2,750 gallons per acre per day. This is based on one standard hole per acre, a drainage layer geonet with hydraulic conductivity of 0.06 meters per second and a 50% safety factor. The assumption underlying this ALR calculation would be verified in the actual constructed surface impoundments. Based on a 5.0-acre pond, each surface impoundment would have an ALR of 13,750 gallons per day. However, the ALR would need to have field verification because this rate would vary depending on actual drainage material used and its hydraulic conductivity. A final ALR would be submitted to the Energy Commission based on field analysis. A large hole in the geomembrane may cause a rapid large leakage rate (RLLR) of approximately 9,500 gallons per acre per day. This would equate to a RLLR of 47,500 gallons per day per surface impoundment. The RLLR is provided for informational purposes only. The recording flow totalizer at each sump would be monitored at least daily to determine the leakage rate through the primary liner. If the leakage rate exceeds the ALR, then the appropriate actions in the SPCC Plan would be implemented.

LAND TREATMENT UNITS

19. DESCRIPTION OF LAND TREATMENT UNITS

Each of the two Land Treatment Units (LTUs) would be a waste management unit and would cover an area of approximately 75 feet by 150 feet. The LTU would not incorporate a liner containment system or LCRS, but would be constructed with a prepared base consisting of 2 feet of compacted, low permeability, lime-treated material. This base would serve as a competent platform for land treatment activities, and would serve to slow the rate of surface water infiltration in the treatment area.

The compacted and native soil beneath the LTU is designated as a “treatment zone” to a depth of 5 feet. Although the LTU will be taking vehicle traffic, no hard surface would be required, as there is no liner system to protect. A staging area is allocated in the LTU for storage of heat transfer fluid (HTF)-impacted soils while they are being characterized. Soil characterized as hazardous would be removed from the site; therefore, no additional liner system would be required in the LTU for the hazardous waste. The staging area would have temporary plastic sheeting placed beneath the soil piles during characterization and plastic sheeting placed over the piles during precipitation events.

Each LTU would be surrounded on all sides by two-feet high reinforced concrete walls. These walls and site grading would control and prevent run-on of storm water into the LTU or run-off of storm water from the unit. CCR, title 27, section 20250 (b)(5) prescriptive requirements require that no waste shall migrate below the treatment zone.

Approximately 2,292,000 gallons of HTF (Therminol VP-1 [diphenyl ether (73.5%) and biphenyl (26.5%)]) would be utilized at any one time within the Facility. However, the anticipated volume of soil within the LTU contaminated with HTF would not exceed 750 cubic yards. Based on available operation data from other sites, it is anticipated that approximately 750 cubic yards (on average) of HTF-affected soil may be treated per year. Larger or smaller quantities could be generated during some years, depending on the frequency and size of leaks and spills. A SPCC plan would be developed for the Facility.

Storm water may occasionally accumulate in the LTU. This storm water can be pumped to the surface impoundments only after visual observation establishes that the water is free from HTF product and sheen. Based on conditions at similar sites in the area, it is anticipated that such discharge, if necessary, would only occur approximately once every three to five years.

20. WASTE MANAGEMENT UNITS CLASSIFICATION

Pursuant to CCR, title 27, section 20250, the surface impoundments and the land treatment unit are classified as Class II waste management units. Pursuant to CCR, title 27, section 20310, the units would be located outside of the 100-year flood plain and seismic hazard zones. In addition, the base of the waste management units would have a greater than five-foot separation to the underlying groundwater because the depth to groundwater is typically greater than 150 feet bgs.

21. WASTE CLASSIFICATION

A. Wastewater

The anticipated wastewater concentrations have been compared to the Soluble Threshold Limit Concentrations (STLCs) as reported in the CCR, title 22, section 66261.24 “Characteristics of Toxicity,” and compared to Toxicity Characteristic Leaching Procedure (TCLP) values as reported in the Code of Federal Regulations (CFR) Part 261, section 261.24. The anticipated concentration of chemical constituents in wastewater discharging into the surface impoundments would be less than the STLC and TCLP for all reported parameters. Therefore, the wastewater would not be considered a hazardous waste under State or Federal regulations.

B. Residual Solids

Hazardous wastes, per California Health and Safety Code section 25208 (Toxic Pits Cleanup Act), are prohibited from being either discharged into, being stored or accumulating via evaporative process within the surface impoundments. The nonhazardous wastewater discharged to the surface impoundments is hereby classified as a liquid designated waste. Residual solids remaining after evaporation are expected (April 2010 ROWD) to contain inorganic salts below hazardous waste levels.

The Water Code section 13173 defines a designated waste as:

1. Hazardous waste that has been granted a variance from hazardous waste management requirements pursuant to Health and Safety Code, section 25143 or,

2. Nonhazardous waste that consists of, or contains, pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives, or that could reasonably be expected to affect beneficial uses of the waters of the state as contained in the appropriate state water quality control plan.

C. <u>HTF-contaminated soil</u>

The Department of Toxic Substances Control will determine a hazardous waste concentration (in milligrams of HTF per kilogram of soil) for HTF-contaminated soil. HTF-contaminated soil would be considered inert if the concentration is less than or equal to 100 milligrams per kilogram (mg/kg) or is 1/100 of the hazardous waste level, whichever is more conservative. (The hazardous waste concentration at another similar site for HTF-contaminated soil is 10,000 mg/kg). HTF-contaminated soil at concentrations between the hazardous waste concentration and the inert concentration is classified as designated waste.

The wastewater discharged into the surface impoundments would be expected to be nonhazardous; however, the wastewater would contain pollutants (e.g., TDS, fluoride, selenium, and chromium) that could exceed water quality objectives if released, or that could be expected to affect the beneficial uses of waters of the state. Therefore, the wastewater would be classified as a “designated waste.” This classification is consistent with CCR, title 27, section 20210.

GROUNDWATER MONITORING NETWORK

22. GROUNDWATER MONITORING NETWORK (GMN)

The April 2010 ROWD proposes a Groundwater Monitoring Network (GMN) of six monitoring wells: three would monitor the Alpha Block waste management units and three would monitor the Beta Block waste management units. Each pair of two surface impoundments and a land treatment unit would have one upgradient and two down- gradient monitoring wells.

MONITORING PROGRAMS

23. STATISTICAL METHODS

Statistical analysis of monitoring data is necessary for the earliest possible detection of a statistically significant evidence of a release of waste from the Facility. CCR, title 27 requires statistical data analysis. The Monitoring and Reporting Program (MRP) includes methods for statistical analysis. The

monitoring parameters listed in the MRP are believed to be the best indicators of a release from the Facility.

24. DETECTION MONITORING PROGRAM

Pursuant to CCR, title 27 section 20420, the applicant has proposed a detection monitoring program for the Facility. The detection monitoring program for the surface impoundments consists of monitoring the LCRS, moisture detection network (neutron probe network), and monitoring wells for the presence of liquid and/or constituents of concern. The program to monitor the LCRS and water bearing media for evidence of a release, as well as the monitoring frequency, is specified in the MRP. The detection monitoring program for the Land Treatment Unit consists of collecting and analyzing samples of the native soil in, and underneath, the treatment zone for the presence of HTF. The frequency of monitoring is specified in the MRP.

25. EVALUATION MONITORING PROGRAM

An Evaluation Monitoring Program (EMP) is required, pursuant to CCR, title 27 section 20425, to evaluate evidence of a release if detection monitoring and/or verification procedures indicate evidence of a release.

26. CORRECTIVE ACTION PROGRAM

A Corrective Action Program (CAP) to remediate detected releases from the surface impoundments or land treatment unit may be required pursuant to CCR, title 27, section 20430, if results of an EMP warrant a CAP. The applicant submitted a CAP as part of the April 2010 ROWD.

27. CLOSURE AND POST-CLOSURE MAINTENANCE PLAN FOR THE SURFACE IMPOUNDMENTS

The applicant submitted a Preliminary Evaporation Pond Closure Plan as part of the April 2010 ROWD.

28. REASONABLY FORESEEABLE RELEASE FOR THE SURFACE IMPOUNDMENTS

The applicant submitted a CAP to address a reasonably foreseeable release. The scenario presented in the CAP is a dike failure in which the applicant is required to remediate and clean up soil that may become contaminated due to a release from the surface impoundments.

29. CLOSURE AND POST-CLOSURE MAINTENANCE PLAN FOR THE LAND TREATMENT UNIT

The applicant submitted a Preliminary Land Treatment Unit Closure Plan as part of the April 2010 ROWD.

30. REASONABLY FORESEEABLE RELEASE FOR THE LAND TREATMENT UNIT

The applicant submitted a CAP to address a reasonably foreseeable release from the Land Treatment Unit. The scenario presented in the CAP

for the Land Treatment Unit is a release to native soil underlying the treatment zone.

Corrective action includes excavation and proper disposal of HTF-contaminated soil from the Land Treatment Unit and replacing the excavation with clean native soil.

31. NARRATIVE AND NUMERICAL WATER QUALITY OBJECTIVES

The Basin Plan incorporates narrative and numerical water quality objectives that apply to all ground and surface waters within the Lahontan Region. In general, where more than one objective is applicable, the stricter objective applies.

SOIL AND WATER RESOURCES – ATTACHMENT B

REQUIREMENTS FOR WASTE DISCHARGE

I. DISCHARGE SPECIFICATIONS

A. Storm Water Discharges

Waste in discharges of storm water to waters of the State must be reduced or prevented to achieve the best practicable treatment level using controls, structures, and management practices. The applicant shall comply with all substantive portions of the requirements (with the exception of purely administrative requirements, e.g., filing a Notice of Intent) contained in State Water Board's *Waste Discharge Requirements For Discharges of Storm Water Discharges Associated With Construction Activity, General Permit No. CAS00002* and *Waste Discharge Requirements For Discharges of Storm Water Associated With Industrial Activities, General Permit No. CAS00001* and all subsequent revisions and amendments.

These requirements do not preclude the applicant from requirements imposed by municipalities, counties, drainage districts, and other local agencies regarding discharges of storm water to separate storm sewer systems or other water, conveyances and water bodies under their jurisdiction.

B. Receiving Water Limitations

Surface Water and Groundwater Objectives

Receiving water limitations are narrative and numerical water quality objectives contained in the Water Quality Control Plan for the Lahontan Basin (Basin Plan) for all surface waters and groundwaters of the Lahontan Region. As such, they are required to be met. The discharge of waste to surface waters shall not cause, or contribute to, a violation of the following water quality objectives for waters of the Lockhart Hydrologic Unit.

Surface Water

a. Ammonia

Ammonia concentrations shall not exceed the values listed in Tables 3-1 to 3-4 of the Basin Plan for the corresponding conditions in these tables. Tables 3-1 to 3-4 of the Basin Plan are incorporated into these requirements by reference.

b. Bacteria, Coliform

i. Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes.

ii. The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 milliliter (ml), nor shall more than 10% of all samples collected during any 30-day period exceed 40/100 ml. The log mean shall ideally be based on a minimum of not less than five samples collected as evenly spaced as practicable during any 30-day period. However, a log mean concentration exceeding 20/100 ml, or one sample exceeding 40/100 ml, for any 30-day period shall indicate violation of this objective even if fewer than five samples were collected.

c. Biostimulatory Substances

Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses.

d. Chemical Constituents

i. Waters designated as MUN (a beneficial use of surface water of the Lockhart Hydrologic Unit) shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary MCL based upon drinking water standards specified in provisions of the CCR, Title 22, Division 4, Chapter 15, hereby incorporated by reference into these requirements. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

ii. Waters shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses.

e. Chlorine, Total Residual

For the protection of aquatic life, total chlorine residual shall not exceed either a median value of 0.002 milligrams per liter (mg/L) or a maximum value of 0.003 mg/L. Median values shall be based on daily measurements taken within any six-month period.

f. Color

Waters shall be free of coloration that causes nuisance or adversely affects the water for beneficial uses.

g. Dissolved Oxygen

i. The dissolved oxygen concentration as percent saturation shall not be depressed by more than 10%, nor shall the minimum dissolved oxygen concentration be less than 80% of saturation.

ii. For waters with the beneficial uses of WARM (a beneficial use of surface water in the Lockhart Hydrologic Area), the minimum dissolved oxygen concentration shall not be less than that specified in Table 3-6 of the Basin Plan. Table 3-6 of the Basin Plan is incorporated herein by reference.

h. Floating Materials

i. Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect the water for beneficial uses.

ii. The concentrations of floating material shall not be altered to the extent that such alterations are discernible at the 10% significance level.

i. Oil and Grease

i. Waters shall not contain oils, greases, waxes or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect the water for beneficial uses.

ii. The concentration of oils, greases, or other film or coat generating substances shall not be altered.

j. Pesticides

i. For the purposes of these requirements, pesticides are defined to include insecticides, herbicides, rodenticides, fungicides, piscicides and all other economic poisons. An economic poison is any substance intended to prevent, repel, destroy, or mitigate the damage from insects, rodents, predatory animals, bacteria, fungi, or weeds capable of infesting or harming vegetation, humans, or animals (California Agriculture Code 12753).

ii. Pesticide concentrations, individually or collectively, shall not exceed the lowest detectable levels, using the most recent detection procedures available. There shall not be an increase in pesticide concentrations found in bottom sediments. There

shall be no detectable increase in bioaccumulation of pesticides in aquatic life.

iii. Waters designated as MUN shall not contain concentrations of pesticides or herbicides in excess of the limiting concentrations set forth in the CCR, Title 22, Division 4, Chapter 15. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

k. pH

i. In fresh waters with designated beneficial use of WARM, changes in normal ambient pH levels shall not exceed 0.5 pH units.

ii. The California Energy Commission recognizes that some waters of the Lahontan Region may have natural pH levels outside of the 6.5 to 8.5 range. Compliance with the pH objective for these waters will be determined on a case-by-case basis.

l. Radioactivity

i. Radionuclides shall not be present in concentrations, which are deleterious to human, plant, animal, or aquatic life nor which result in the accumulation of radionuclides in the food web to an extent, which presents a hazard to human, plant, animal, or aquatic life.

ii. Waters designated as MUN shall not contain concentrations of radionuclides in excess of the limits specified by the more restrictive of the CCR Title 22 Division 4, Article 5 sections 64441 et seq. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

m. Sediment

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses.

n. Settleable Materials

Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or that adversely affects the water for beneficial uses. The concentration of settleable materials shall not be raised by more than 0.1 milliliter per liter.

o. Suspended Materials

i. Waters shall not contain suspended materials in concentrations that cause nuisance or that adversely affect the water for beneficial uses.

ii. The concentration of total suspended materials shall not be altered to the extent that such alterations are discernible at the 10% significance level.

p. Taste and Odor

Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish or other edible products of aquatic origin, that cause nuisance, or that adversely affect the water for beneficial uses. The taste and odor shall not be altered.

q. Temperature

i. The natural receiving water temperature of all waters shall not be altered unless it can be demonstrated to the satisfaction of the California Energy Commission that such an alteration in temperature does not adversely affect the water for beneficial uses.

ii. For waters designated WARM, water temperature shall not be altered by more than five degrees Fahrenheit above or below the natural temperature.

r. Toxicity

i. All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

ii. The survival of aquatic life in surface waters subjected to a waste discharge, or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge, or when necessary, for other control water that is consistent with the requirements for "experimental water" as defined in the most recent edition of *Standard Methods for the Examination of Water and Wastewater* (American Public Health Association, et al.).

s. Turbidity

Waters shall be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10%.

Groundwater

The discharge of waste to groundwaters shall not cause, or contribute to, a violation of the following water quality objectives for waters of the Harper Valley Groundwater Basin.

Bacteria, Coliform

In groundwaters designated as MUN (a beneficial use of groundwater of the Harper Valley Ground Water Basin), the median concentration of coliform organisms over any seven-day period shall be less than 1.1/100 milliliters.

Chemical Constituents

i. Groundwaters designated as MUN shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary MCL based upon drinking water standards specified in provisions of the CCR, Title 22, Division 4, Chapter 15, hereby incorporated by reference into these requirements. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

ii. Groundwaters shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses.

Radioactivity

Groundwaters designated as MUN shall not contain concentrations of radionuclides in excess of the limits specified by the more restrictive of the CCR Title 22 Division 4, Article 5 sections 64441 et seq. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

Taste and Odor

Waters shall not contain taste or odor-producing substances in concentrations that cause nuisance or that adversely affect beneficial uses. For groundwaters designated MUN, at a minimum, concentrations shall not exceed adopted secondary MCLs based upon drinking water standards specified in provisions of the CCR, Title 22, Division 4, Chapter 15, hereby incorporated by reference into these requirements. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

II. PROHIBITIONS AND REQUIREMENTS

The discharge of wastes associated with the Facility must not violate the following waste discharge prohibitions. These waste discharge prohibitions do not apply to discharges of storm water when wastes in the discharge are controlled through the application of management practices or other means and the discharge does not cause a violation of water quality objectives. The California Energy Commission expects that control measures would be implemented in an iterative manner as needed to meet applicable receiving water quality objectives.

A. Regionwide Prohibitions

1. The discharge of waste,[(i)] which causes violation of any narrative water quality objective contained in the Basin Plan, including the Nondegradation Objective, is prohibited.

2. The discharge of waste, which causes a violation of any numeric water quality objective contained in the Basin Plan, is prohibited.

3. Where any numeric or narrative water quality objective contained in the Basin Plan is already being violated, the discharge of waste which causes further degradation or pollution is prohibited.

4. The discharge of untreated sewage, garbage, or other solid wastes into surface waters of the Lahontan Region is prohibited. (For the purposes of this prohibition, "untreated sewage" is that which exceeds secondary treatment standards of the Federal Water Pollution Control Act, which are incorporated in the Basin Plan in Section 4.4 under "Surface Water Disposal of Sewage Effluent.")

5. For municipal[(ii)] and industrial[(iii)] discharges:

   a. The discharge, bypass, or diversion of raw or partially treated sewage, sludge, grease, or oils to surface waters is prohibited.

   b. The discharge of wastewater except to the designated disposal site (as designated in waste discharge requirements) is prohibited.

   c. The discharge of industrial process wastes[(iv)] to surface waters designated for the Municipal and Domestic Supply (MUN)

Definitions:

(i) "Waste" is defined to include any waste or deleterious material including, but not limited to, waste earthen materials (such as soil, silt, sand, clay, rock, or other organic or mineral material) and any other waste as defined in the California Water Code § 13050(d).

(ii) "Municipal waste" is defined in Section 4.4 of the Basin Plan.

(iii) "Industry" is defined in Section 4.7 of the Basin Plan.

beneficial use is prohibited. The discharge of industrial process wastes to surface waters not designated for the MUN use may be permitted if such discharges comply with the General Discharge Limitations in Section 4.7 of the Basin Plan and if appropriate findings under state and federal anti-degradation regulations can be made.

Prohibitions 5(b) and 5(c) do not apply to industrial storm water. For control measures applicable to industrial storm water, see Section 4.3 of this Basin Plan, entitled "Stormwater Runoff, Erosion, and Sedimentation."

Prohibitions 5(b) and 5(c) do not apply to surface water disposal of treated groundwater. For control measures applicable to surface water disposal of treated ground water, see the current applicable Lahontan Regional Board.

B. <u>Facility Discharge Prohibitions</u>

1. Activities and waste discharges associated with the Facility must not cause or threaten to cause a nuisance or pollution as defined in Water Code section 13050.

2. The discharge or deposition of any wastes into channels, surface water, or any place where it would be discharged or deposited where it would be eventually transported to surface waters, including the 100-year floodplain, must not contain or consist of any substance in concentrations toxic to animal or plant life.

3. The discharge or deposition of any wastes into channels, surface water, or any place where it would be discharged or deposited where it would be eventually transported to surface waters, including the 100-year floodplain, must not contain or consist of oil or other floating materials from any activity in quantities sufficient to cause deleterious bottom deposits, turbidity, or discoloration in surface waters.

(iv) "Industrial process wastes" are wastes produced by industrial activities that result from one or more actions, operations, or treatments which modify raw material(s) and that may (1) add to or create within the effluent, waste, or receiving water a constituent or constituents not present prior to processing, or (2) alter water temperature and/or the concentration(s) of one or more naturally occurring constituents within the effluent, waste or receiving water. Certain non-stormwater discharges may occur at industrial facilities that are not considered to be industrial process wastes for the purposes of Prohibition 5(c). Examples include: fire hydrant flushing, atmospheric condensates from refrigeration and air conditioning systems, and landscape watering.

4. The discharge of waste, as defined in the Water Code that causes violation of any narrative water quality objective contained in the Basin Plan is prohibited.

5. The discharge of waste that causes violation of any numeric water quality objective contained in the Basin Plan is prohibited.

6. Where any numeric or narrative water quality objective contained in the Basin Plan is already being violated, the discharge of waste that causes further degradation or pollution (as defined in Water Code Section 13050) is prohibited.

7. The discharge of septic tank pumpings (septage) or chemical toilet wastes to other than a sewage treatment plant or a waste hauler is prohibited.

C. <u>Requirements</u>

The applicant shall develop a final Storm Water Pollution Prevention Program (SWPPP) in accordance with the State Water Board's *General Permit No. CAS00001* and *General Permit No. CAS00002*. This SWPPP, or any future revision to this SWPPP, and the associated Drainage, Erosion, and Sediment Control Plan (DESCP), shall be implemented after approval by the California Energy Commission's Compliance Project Manager (CPM).

1. The applicant must, at all times, maintain appropriate types and sufficient quantities of material on site to contain any spill or inadvertent release of materials that may cause a condition of pollution or nuisance if the materials reach waters of the State.

2. Discharges of wastewater generated by the Facility's operations, including cooling water, are not allowed to be released to the offsite environment.

3. The applicant must permit California Energy Commission staff or their authorized representative upon presentation of credentials:

   a. Entry onto Facility premises.

   b. Access to copy any record required to be kept under the terms and conditions of the Conditions of Certification or equivalent document.

   c. Inspection of any treatment equipment, monitoring equipment, or monitoring method required by the Conditions of Certification.

   d. Sampling of any discharge or surface water covered by the Conditions of Certification.

4. The applicant must immediately notify the California Energy Commission staff by telephone whenever an adverse condition occurs as a result of this discharge. Such a condition includes, but is not limited to, a violation of the conditions of the Conditions of Certification, a significant spill of petroleum products or toxic chemicals, or damage to control facilities that would cause noncompliance. A written notification of the adverse condition must be provided to the California Energy Commission within two weeks of occurrence. The written notification must identify the adverse condition, describe the actions necessary to remedy the condition, and specify a timetable, subject to any modifications by California Energy Commission staff, for the remedial actions.

5. The applicant must comply with the Monitoring and Reporting Program for Groundwater, included in these requirements.

III. PROVISIONS

A. <u>Special Provisions for Impacts to State Waters</u>

1. The Discharger must comply with terms and conditions of these WDRs. Any noncompliance constitutes a violation of the WDRs pursuant to the Porter-Cologne Water Quality Act (Water Code Section 13000 et seq.), and is grounds for enforcement action by the CEC or the Regional Board.

2. Detailed final grading plans must be provided to the California Energy Commission a minimum of 60 days prior to commencement of construction activities.

3. Construction equipment must be clean and free from oil, grease, and loose metal material and must be removed from service if necessary to protect water quality.

4. No debris, cement, concrete (or wash water therefrom), oil or petroleum products must be allowed to enter into or be placed where it may be washed from the Facility site by rainfall or runoff into waters of the State. When operations are completed, any excess material must be removed from the Facility work area and any areas adjacent to the work area where such material may be transported into waters of the State as defined in Water Code section 13050.

5. No equipment may be operated in areas of flowing or standing water; no fueling, cleaning, or maintenance of vehicles or equipment must take place within any areas where an accidental discharge to waters of the State may occur; construction materials

and heavy equipment must be stored outside of the flow of the waters of the State. When work within the boundaries of waters of the State is necessary, the entire streamflow must be diverted around the work area, temporarily, as needed to control waste discharge.

B. <u>Special Provisions for Storm Water</u>

1. The applicant must ensure that storm water discharges and non-storm water discharges do not cause or contribute to an exceedance of any applicable water quality standards.

2. Post-construction storm water flows emanating from the Facility site must not exceed predevelopment levels. Runoff from newly constructed impervious areas that is greater than background levels must be treated and detained to predevelopment runoff levels. Methods such as *low impact development* may be used to achieve this requirement (see State Water Board Resolution No. 2008-0030). Detention and/or infiltration facilities for a 10-year, one-hour storm event fulfills this requirement for the purposes of these requirements.

3. The applicant must implement Best Management Practices (BMPs) to prevent or reduce the discharge of wastes associated with water contacting construction materials or equipment.

4. The applicant must provide effective cover, mulch, fiber blankets, or other erosion control for soils disturbed by construction activities.

5. The applicant must provide BMPs for erosion stabilization for all areas of disturbed soil regardless of time of year, including erosion from rainfall, non-storm water runoff, and wind.

6. The applicant must stabilize from erosion all finished slopes, open space, utility backfill, and graded or filled lots within two weeks from when excavation or grading activity has been completed.

7. The applicant must control runon from offsite areas, route flows away from disturbed areas in a manner that does not cause onsite or offsite erosion, and provide controls to minimize runon and problems from storm water flows into active or disturbed Facility areas from offsite areas.

8. The applicant must, at all times, maintain effective perimeter controls and stabilize all construction entrances/exits sufficiently to control erosion and soil or sediment discharges from the site.

9. The applicant must properly install and effectively maintain all BMPs for storm drain inlets and perimeter controls, runoff control BMPs, and stabilized entrances/exits.

10. The applicant must ensure that construction activity traffic to and from the Facility is limited to entrances and exits that employ effective controls to prevent offsite tracking of soil.

11. The applicant must ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant control at entrances/exits are maintained and protected from activities that could reduce their effectiveness.

12. The applicant must comply with the following source control requirements:

    a. Develop the Facility in a way that reduces the amount of soil exposed to erosion at any time.

    b. Inspect and remove accumulated deposits of soil at all inlets to the storm drain system at frequent intervals during rainy periods.

    c. Provide buffer strips and/or silt barrier fencing between the active construction area and any water bodies.

    d. Provide "good housekeeping" measures for construction materials, waste management, vehicle storage and maintenance, and landscape materials at all times including, but not limited to, the list of required measures in Attachment A, which is made a part of these requirements.

13. The applicant must maintain, in perpetuity, post-construction control and treatment measures for storm water, or must identify in writing to the California Energy Commission, the entity that is legally responsible for maintaining the post-construction controls at the Facility site.

14. The applicant shall have in place adequate emergency response plans in order to clean up any spill or release of any waste at the Facility.

C. <u>Special Provisions for the Waste Management Units (Surface Impoundments and Land Treatment Units)</u>

1. There shall be no discharge, bypass, or diversion of wastewater from the collection, conveyance, or disposal facilities to adjacent land areas or surface waters.

2. All facilities used for the collection, conveyance, or disposal of waste shall be adequately protected against overflow, washout, inundation, structural damage, or a significant reduction in efficiency resulting from a storm or flood having a recurrence interval of once in 100 years. The surface impoundments and land treatment unit (LTU) shall be designed and maintained with the capacity to capture the 1,000-year, 24-hour storm.

3. The release of wastewater shall not cause the presence of the groundwater monitoring parameters listed in the Monitoring and Reporting Programs for Groundwater to be in excess of established background levels as described in the April 2010 Report of Waste Discharge (ROWD).

4. The discharge, storage, or evaporative accumulation of hazardous waste to waste management units at the Facility is prohibited.

Special Provisions for Surface Impoundments

1. Only wastewater from cooling water blow down and process water (e.g. the reverse-osmosis system reject water), or storm water that may accumulate in the LTU shall be discharged to the surface impoundments.

2. The discharge of wastewater at the Facility except to the authorized disposal sites (i.e., the surface impoundments) of these requirements is prohibited.

3. All lined facilities shall be effectively sealed to prevent the exfiltration of liquids. For this project, "effectively sealed" facilities are the surface impoundments that are designed and constructed in accordance with the requirements of CCR, title 27.

4. The vertical distance between the liquid surface elevation and the highest part of a surface impoundment dike (i.e. the freeboard), or the invert of an overflow structure, shall not be less than two feet.

Special Provisions for the Leachate Collection and Removal System

1. If liquids are detected in the leachate collection and removal system (LCRS) sumps at a rate equal to or greater than the “Action Leakage Rate” as described in the April 2010 ROWD, then the applicant shall comply with the notice of evidence of response to exceeding the action leakage rate requirements presented in the appropriate section of the Monitoring and Reporting Program for Groundwater included with these requirements.

2. If liquids are detected in the LCRS sumps at rates greater than the "Rapid and Large Leakage Rate" as described in the April 2010 ROWD, the applicants shall immediately notify the California Energy Commission and cease the discharge of waste to the affected impoundment. Discharges of waste to the affected impoundment shall be prohibited until the appropriate repairs are made.

3. The depth of leachate in the leachate collection sump shall be kept at the minimum needed to ensure efficient sump dewatering pump operation.

4. The LCRS shall be operated to function without clogging throughout the life of the project including closure and post closure maintenance periods.

5. The LCRS shall be tested at least once annually to demonstrate proper operation.

6. The LCRS shall be capable of removing twice the maximum anticipated daily volume of leachate from the surface impoundments.

7. Any leachate collected in any LCRS shall be returned to the surface impoundments.

Special Provisions for the Land Treatment Unit

1. Only soil contaminated with Therminol or similarly approved HTF and originating at this Facility shall be accepted for treatment at the Land Treatment Unit.

2. All contaminated soil in the staging area shall be placed on plastic sheeting. All contaminated soil in the staging area shall be covered with plastic sheeting during precipitation events.

3. Soil treated at the Land Treatment Unit may be used as fill material, road base or as a cover at the Facility (excluding any area within the 100-year floodplain) if the following concentration limit is not exceeded:

Parameter	**Maximum Concentration of The Composite Sample**
Heat Transfer Fluid Therminol (biphenyl, and diphenyl oxide) or related HTF that has similar environmental fate and transport characteristics as Therminol.	100 milligram per kilogram (mg/kg) or 1/100 of the hazardous waste level, whichever is less (i.e., more conservative) (The site-specific hazardous waste level for heat transfer fluid is to be determined.)

Good Housekeeping Best Management Practices

1. **Good housekeeping measures for construction materials include:**
   a. Maintaining an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced.

   b. Covering and berming loose stockpiled construction materials (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

   c. Storing chemicals in watertight containers or in a bermed storage shed (completely enclosed), with appropriate secondary containment.

   d. Minimizing contact of construction materials with precipitation.

   e. Implementing BMPs to reduce or prevent the offsite tracking of loose construction and landscape materials.

2. **Good housekeeping measures for waste management include:**
   a. Preventing disposal of any rinse/wash waters or materials into the storm drain system.

   b. Berming sanitation facilities (e.g. Porta Potties) and preventing them from being kept within the curb and gutter or on sidewalks or adjacent to a storm drain.

   c. Cleaning or replacing sanitation facilities and inspecting them regularly for leaks and spills.

   d. Covering waste disposal containers when they are not in use and preventing them from overflowing.

   e. Berming and securely protecting stockpiled waste material from wind and rain at all times unless actively being used where spill would enter surface drainage systems.

   f. Addressing procedures to deal with hazardous and non-hazardous spills.

   g. Preparing and implementing a spill response and implementation plan prior to commencement of construction activities, including:
      i. Locations of on-site equipment and materials for cleanup of spills and leaks.

      ii. Procedures to follow in the event of spill or leak that includes immediate cleanup.

      iii. Locations and procedures of disposing of waste materials.

iv. Identification of and training for spill response personnel.

h. Lining and berming of concrete washout areas so there is no leakage or overflow into the underlying soil and onto the surrounding areas. Washout areas must be positioned away from drain inlets and waterways and be clearly labeled.

3. **Good housekeeping measures for vehicle storage and maintenance include:**

   a. Not allowing oil, grease, or fuel to leak in to the soil.

   b. Placing all equipment or vehicles to be fueled, maintained and/or stored in a designated area fitted with appropriate BMPs.

   c. Cleaning leaks immediately and disposing of leaked materials and sorbents properly.

   d. Fix leaks immediately or remove equipment for service.

4. **To assess the potential pollutant sources and identify all areas of the site where good housekeeping or additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and non-storm water discharges, the applicant must assess and report on the following:**

   a. The quantity, physical characteristic (liquid, powder, solid, etc.), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.

   b. The degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.

   c. The direct and indirect pathways that pollutants may be exposed to storm water discharges and non-storm water discharges. This must include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

   d. Sampling, visual observation, and inspection records.

   e. Effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and non-storm water discharges.

SOIL AND WATER RESOURCES – ATTACHMENT C

MONITORING AND REPORTING PROGRAM FOR GROUNDWATER

I. WATER QUALITY PROTECTION STANDARD

Water Quality Protection Standard is required by Title 27 of the California Code of Regulations (CCR, title 27) to assure the earliest possible detection of a release from the Mojave Solar Project (Mojave) to underlying soil and/or groundwater. The Water Quality Protection Standard shall consist of the list of constituents of concern, the concentration limits, the Point of Compliance and all Monitoring Points. This Water Quality Protection Standard shall apply during the operation, closure, post-closure maintenance period, and during any compliance period. Mojave will initially undergo construction and then will be under a Detection Monitoring Program as documented in the April 2010 Report of Waste Discharge (ROWD).

II. MONITORING

A. Flow Monitoring of Discharges to the Surface Impoundments (four evaporation ponds)

The April 2010 ROWD states that discharge to the surface impoundments is derived from two primary sources (cooling tower blow down water and process wastewater [e.g. reverse-osmosis system reject water]) generated from treatment of water for use at the plant and discharged to the surface impoundments.

The applicant shall monitor the following:

1. The volume, in million gallons per day (mgd), of wastewater delivered to the surface impoundments;

2. The cumulative total of wastewater flow delivered to the surface impoundments, in million gallons per month; and

3. The maximum daily flow rate, in mgd, delivered to the surface impoundments each month.

B. Monitoring of Wastewater Discharges to the Surface Impoundments

Semiannually, the applicant shall record the following:

1. The sources of wastewater delivered to the surface impoundments;

2. The amount and types of chemical additives added to the cooling system water that may be discharged to the surface impoundments; and

3. The analytical results of a composite wastewater grab sample that shall be collected and analyzed at a state-certified laboratory for the parameters in Table II-1.

Table II-1: Wastewater Sampling Parameters

Parameter	U.S. EPA or Standard Method	Reporting Limit Goal	Units
Ammonia (as N)	350.1	100	µg/L
Aluminum	200.7	20	µg/L
Arsenic	6020	2	µg/L
Antimony	6020	10	µg/L
Barium	6020	5	µg/L
Beryllium	6020	2	µg/L
Boron	200.7	140	µg/L
Cadmium	6020	5	µg/L
Calcium	200.7	40,000	µg/L
Chloride	300.0	14,000	µg/L
Chromium (total)	6020	5	µg/L
Cobalt	6020	5	µg/L
Copper	6020	5	µg/L
Fluoride	300.0	500	µg/L
Iron	200.7	20	µg/L
Lead	6020	3	µg/L
Magnesium	200.7	10,000	µg/L
Manganese	200.7	15	µg/L
Mercury	7470A	0.2	µg/L
Molybdenum	6020	10	µg/L
Nickel	6020	5	µg/L
Nitrate as nitrogen	300.0	1,000	µg/L
Nitrite as nitrogen	SM 4500	4	µg/L
Phosphate (total)	365.3	100	µg/L
Potassium	200.7	3,000	µg/L
Selenium	6020	10	µg/L
Silver	6020	5	µg/L
Sodium	200.7	10,000	µg/L
Strontium	200.7	500	µg/L
Sulfate	300.0	10,000	µg/L
Thallium	6020	10	µg/L
Total dissolved solids	SM 2540C	10,000	µg/L

Parameter	U.S. EPA or Standard Method	Reporting Limit Goal	Units
Total alkalinity(as CaCO3)	SM 2320B	10,000	µg/L
Vanadium	6020	5	µg/L
Zinc	6020	10	µg/L
Biphenyl *	8015M	500	µg/L
Diphenyl oxide *	8015M	500	µg/L
Cyclohexamine (20-40%) *	8015M	500	µg/L
Morpholine (1-10%) *	8015M	500	µg/L
pH	Field	+/- 0.1	pH units
Temperature	Field	+/- 0.1	° F or °C

µg/L = micrograms per liter
note * -- Analysis of these constituents is not necessary if storm water from the land treatment unit was not discharged into the surface impoundments

C. Surface Impoundment Monitoring

1. Dikes and Liners

a. Daily, the freeboard shall be measured from the top of the lowest part of the dike to the wastewater surface. If the surface impoundment is dry, indicate that it is empty of wastewater.

b. Monthly, the integrity of the dikes and liners shall be inspected. Should the inspection indicate any damage to the dikes or liners or if an unauthorized discharge has occurred, or is likely to occur, the California Energy Commission shall be notified within 48 hours, followed by confirmation in writing.

2. Leachate Collection and Removal System (LCRS)

a. Weekly, visual inspection for liquid in the leachate collection detection sumps for each surface impoundment shall be conducted. The results of those inspections shall be recorded in a permanent log book.

b. All volume of liquid pumped out of the leakage detection sumps for each surface impoundment shall be recorded along with date, time and discharge location, in a permanent log book kept on-site.

3. Surface Impoundment Wastewater Monitoring

Semiannually, at each surface impoundment, liquid grab samples shall be collected at three (3) sample locations in the surface impoundments spaced approximately equidistant. For each of the

four surface impoundments, the three (3) collected samples shall be composited into one sample (four samples total) by the laboratory.

The analytical results of a wastewater grab from each of the four surface impoundments shall be analyzed at a state-certified laboratory for the parameters in Table II-1. The annual samples shall be collected in the last quarter of each year.

4. Surface Impoundment Sludge Monitoring

Annually, in the last quarter of each year, three (3) representative grab samples of the bottom sludge in each surface impoundment, if present, shall be collected, composited and analyzed for the parameters in Table II-2. For each of the four surface impoundments, the three (3) collected samples shall be composited into one sample (four samples total) by the laboratory.

Table II-2: Surface Impoundment Sludge Monitoring

Parameters	Unit
CCR title 22 metals (CAM 17)- Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc	Milligrams per kilogram (mg/kg)
Biphenyl, diphenyl oxide (Therminol or similar)	mg/kg

D. <u>Detection Monitoring</u>

Using approved statistical or non-statistical data analysis methods, and in compliance with CCR, title 27, the applicant shall, for each monitoring event, compare the concentration of each monitoring parameter with its respective concentration limit to determine if there has been a release from the surface impoundments. Monitoring shall be completed in compliance with this Section D as further described below.

1. Unsaturated Zone Monitoring - Neutron Probe

a. Semiannually, the applicant shall check for the presence of excess moisture below the surface impoundment liners using a neutron moisture probe calibrated for use at the site. If excess moisture content is detected, field verification testing shall be performed and the applicant shall notify the California Energy Commission and report physical evidence of a release (see notification procedures below). Field verification testing may

include a combination of additional neutron analysis, laboratory analysis of liquids drawn from the neutron probe casing and visual observation to verify existence of a release.

b. Annually, the applicant shall submit documentation of instrument calibration, statistical analysis and performance checks. Performance checks shall be a comparison of semiannual results of neutron moisture. Pre testing with earlier tests made under comparable conditions to verify proper operation of equipment must be documented.

2. Groundwater Monitoring

The groundwater monitoring network is required, as proposed in the April 2010 ROWD, consisting of six new monitoring wells, three wells adjacent to each pair of surface impoundments and associated land treatment unit (one well up gradient and two wells downgradient).

a. Semiannually, samples shall be collected in the groundwater monitoring network and analyzed for the parameters listed in Table II-3.

The results of the analysis shall be reported in the semiannual report in tabular and graphical form. Each such graph shall be plotted with raw data at a scale appropriate to show trends or variations in water quality. For graphs showing the trends of similar constituents, the scale shall be the same. The data shall also be used to construct an Upper Tolerance Limit to determine evidence of a release and shall be used to evaluate data from the previous three quarters for evidence of a release.

Table II-3
Groundwater Monitoring Well Sampling Parameters

Parameter	U.S. EPA or Standard Method	Reporting Limit Goal	Units
Ammonia (as N)	350.1	100	µg/L
Aluminum	200.7	20	µg/L
Arsenic	6020	2	µg/L
Antimony	6020	10	µg/L
Barium	6020	5	µg/L
Beryllium	6020	2	µg/L
Boron	200.7	140	µg/L
Cadmium	6020	5	µg/L

Parameter	U.S. EPA or Standard Method	Reporting Limit Goal	Units
Calcium	200.7	40,000	µg/L
Chloride	300.0	14,000	µg/L
Chromium (total)	6020	5	µg/L
Cobalt	6020	5	µg/L
Copper	6020	5	µg/L
Fluoride	300.0	500	µg/L
Iron	200.7	20	µg/L
Lead	6020	3	µg/L
Magnesium	200.7	10,000	µg/L
Manganese	200.7	15	µg/L
Mercury	7470A	0.2	µg/L
Molybdenum	6020	10	µg/L
Nickel	6020	5	µg/L
Nitrate as nitrogen	300.0	1,000	µg/L
Nitrite as nitrogen	SM 4500	4	µg/L
Phosphate (total)	365.3	100	µg/L
Potassium	200.7	3,000	µg/L
Selenium	6020	10	µg/L
Silver	6020	5	µg/L
Sodium	200.7	10,000	µg/L
Strontium	200.7	500	µg/L
Sulfate	300.0	10,000	µg/L
Thallium	6020	10	µg/L
Total dissolved solids	SM 2540C	10,000	µg/L
Total alkalinity(as CaCO3)	SM 2320B	10,000	µg/L
Vanadium	6020	5	µg/L
Zinc	6020	10	µg/L
pH	Field	+/- 0.1	pH units
Temperature	Field	+/- 0.1	° F or °C

b. Semiannually, the groundwater potentiometric surface shall be illustrated on a 8.5" x 11" copy of a site plan showing the static water level, in feet below ground surface; the monitoring well locations; the location of the surface impoundments; and the groundwater gradient under each surface impoundment.

c. Prior to sampling, each monitoring well shall be sufficiently purged in accordance with generally accepted sampling practices in order to obtain a representative ground water sample. If any monitoring well is dry for more than a year, a new or modified monitoring well shall be installed.

Groundwater samples must be collected after the wells have been purged in accordance with California Environmental Protection Agency guidance document, *Representative Sampling of Groundwater for Hazardous Substances*, revised February 2008 (see: http://www.dtsc.ca.gov/SiteCleanup/upload/SMP_Representative_Sampling_GroundWater.pdf). The required stability parameters and criteria from this guidance are summarized in Table II-4.

Table II-4: Stabilization Parameters and Criteria

Parameter	Criteria
temperature	± 3% of reading (minimum of ± 0.2 C)
pH	+/- 0.1
specific electrical conductance	+/- 3%
Oxidation-reduction potential	+/- 10 millivolts
dissolved oxygen	+/- 0.3 milligrams per liter

E. Heat Transfer Fluid Contaminated Soil - Spills or Leaks

1. All spills of heat transfer fluid (HTF) shall be cleaned up within 48 hours. Spills of 20 gallons or more of HTF must be reported to the California Energy Commission within 48 hours. The April 2010 ROWD outlines the procedure for removing contaminated soils from the Facility and temporarily staging the soils within the Land Treatment Unit for hazardous waste testing. Representative soil samples shall be analyzed by a California certified laboratory accredited to conduct the specific analytical method. Disposal of contaminated soil resulting from HTF spills that exceed hazardous waste levels shall be accomplished in accordance with applicable waste disposal regulations.

2. HTF-contaminated soil that does not exceed the hazardous waste levels may be discharged into the Land Treatment Unit. A report for every batch of HTF-contaminated soil discharged into the Land Treatment Unit must include the volume of cubic yards discharged, the sampling method and laboratory analytical reports.

3. Semiannually, the applicant shall report a summary of HTF spills. The summary shall include (1) HTF spill volumes of 20 gallons or greater, (2) locations of spilled HTF, and (3) the dates of spills. The

summary shall also include (1) the total volume of contaminated soil resulting from spills regardless of the volume of HTF spilled, (2) the disposition of the contaminated soil, (3) the total volume of contaminated soil, and (4) a breakdown of the total volume by disposition location (e.g., hauled offsite as hazardous waste, discharged to the LTU, or re-used onsite).

F. Land Treatment Unit (LTU) - Heat Transfer Fluid Contaminated Soil

1. After treatment, the HTF-contaminated soil may be reused at the Facility in accordance with “Special Provisions for the Land Treatment Unit” in Section III C. (Special Provisions for the Waste Management Units) in the Requirements for Mojave Solar. Representative soil samples shall be collected for every batch of treated HTF-contaminated soil prior to removal from the LTU. The samples shall be composited according to methods specified in the U. S. Environmental Protection Agency's current version of the manual: "Test Methods for Evaluating Solid Waste" (SW-846). The status and/or results of sample analysis shall be reported semiannually.

   Annually, the applicant shall verify that HTF is not migrating past the five-foot vertical treatment zone underlying the LTU. Four soil samples (one sample from each quadrant of the LTU) shall be collected at a depth of one foot below the five-foot vertical treatment zone and analyzed for the monitoring parameters listed below. The samples shall be collected and composited according to methods specified in the U. S. Environmental Protection Agency's current version of the manual, "Test Methods for Evaluating Solid Waste" (SW-846). If results of any sample analysis indicate that components of HTF are detected, the applicant shall, within two weeks, repeat deeper sample collection at one foot intervals. The applicant shall repeat sample collection until laboratory analytical results show that concentrations are non-detect. If components of HTF are detected beneath the five-foot treatment zone, the applicant shall, within two weeks, report the evidence of release.

   The samples shall be analyzed for the parameters in Table II-5 listed below using a California certified laboratory.

Table II-5: Land Treatment Unit Monitoring Parameters

Monitoring Parameter	Units
Biphenyl, a component of HTF (Therminol or similar)	mg/kg
Diphenyl oxide , a component of HTF (Therminol or similar)	mg/kg

G. Waste Management Unit Monitoring and Maintenance

1. Quarterly the applicant must inspect the condition of the waste management units (four surface impoundments and two land treatment units) to ensure their integrity. The applicant must provide reports on the inspections semiannually. The quarterly inspection must consist of the following:

   a. The applicant must inspect the waste management units for integrity.

   b. The applicant must inspect the drainage features for the entire site including those that will divert water from the site.

2. During the semiannual sampling events, groundwater monitoring wells shall be inspected for damage. Any adverse conditions found in the visual inspection of the wells must be documented and promptly corrected. Documentation of the correction must be submitted with each semiannual report.

III. DATA ANALYSES

All data analyses methods (statistical or non-statistical) shall meet the requirements of CCR, title 27, section 20415, subdivision (e)(9).

A. General Non-statistical Methods

Evaluation of data will be conducted using non-statistical methods to determine if any new releases from the surface impoundments or land treatment units have occurred. Non-statistical analysis shall be as follows.

1. Physical Evidence

Physical evidence can include dike or berm(s) damage or loss, unexplained volumetric changes in the surface impoundments, groundwater mounding, or soil discoloration. Each annual report shall comment on the absence or presence of physical evidence of a release.

2. Time Series Plots

Each annual report must include time series plots for groundwater monitoring parameters. Time series plots are not required for parameters that have never been detected above their method detection limit (as specified by the applicable USEPA Method) or if there are less than four quarters of data. Evidence of a release may include trends of increasing concentrations of one or more constituent over time.

B. General Statistical Analysis Methods

For Detection Monitoring, the applicant shall use statistical methods to analyze the constituents of concern listed in Table II-3 of this Monitoring and Reporting Program that exhibit concentrations that equal or exceed their respective method detection limit in at least 10% of applicable historical samples. The applicant may propose and use any statistical method that meets the requirements of CCR, title 27, section 20415, subdivision (e)(7). The report titled "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities" (USEPA, 1989) or subsequent versions may also be used to select the statistical test to use for comparing detection monitoring well data to background monitoring data. All statistical methods and programs proposed by the applicant are subject to California Energy Commission approval and must comply with CCR, title 27.

IV. RECORD KEEPING AND REPORTING REQUIREMENTS

A. Scheduled Reports to be Filed with the California Energy Commission

A detection monitoring report shall be submitted to the California Energy Commission. The content of the detection monitoring report shall be as follows:

1. Results of sampling analysis, including statistical limits or each monitoring point;

2. A description and graphical presentation of the velocity and direction of ground water flow under or around the Waste Management Units, based upon water level elevations taken during the collection of the water quality data submitted in the report;

3. A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points;

4. An evaluation of the effectiveness of the leachate collection and recovery system, and of the runoff/runon control facilities; and

5. A letter transmitting the essential points in each report, including a discussion of any requirement violations found since the last report was submitted, and describing actions taken or planned for correcting those violations. If the applicant has previously submitted a detailed time schedule for correcting requirement violations, a reference to the correspondence transmitting this schedule will be satisfactory. If no violations have occurred since the last submittal, this shall be stated in the letter of transmittal.

B. Unscheduled Reports to be Filed

1. Release from the Surface Impoundments

The applicant shall perform the procedures contained in this subsection whenever there is evidence of a release from the surface impoundments.

The applicant shall immediately notify the California Energy Commission verbally whenever a determination is made that there is physical or statistically significant evidence of a release (as determined in compliance with CCR, title 27, section 20164) from a surface impoundment. This verbal notification shall be followed by written notification via certified mail within seven days of such determination. Upon such notification, the applicant may initiate verification procedures or demonstrate that another source other than the Impoundment caused evidence of a release (see below). The notification shall include the following information:

a. The surface impoundment that may have released or be releasing wastewater;

b. General information including the date, time, location, and cause of the release;

c. An estimate of the flow rate and volume of waste involved;

d. A procedure for collecting samples and description of laboratory test to be conducted;

e. Identification of any subsurface water bearing zone affected or threatened;

f. A summary of proposed corrective actions; and

- For statistically significant evidence of a release (as determined in compliance with CCR, title 27, section 20164) - monitoring parameters and/or constituents of concern that have indicated statistically significant evidence of a release from the surface impoundments; or
- For physical evidence of a release - physical factors that indicate physical evidence of a release.

2. Exceeding the Action Leakage Rate

The applicant shall immediately notify the California Energy Commission verbally within twenty-four hours whenever a determination is made that there is a fluid volume in the LCRS sumps in excess of the Action Leakage Rates. This verbal notification shall be followed by written notification via certified mail within seven days of such determination. This written notification shall be followed by a technical report via certified mail within thirty days of such determination. The technical report shall describe the actions taken to abate the adverse condition, and shall describe any proposed future actions to abate the adverse condition.

3. Evaluation Monitoring

Pursuant to California Water Code section 13267, subdivision (b), the applicant shall, within 90 days of verifying a release, submit to the California Energy Commission an amended Report of Waste Discharge proposing an evaluation monitoring program (CCR, title 27, sections 20420, subdivision (k)(5) and 20425). If applicant decides not to conduct verification procedures, or decides not to make a demonstration that a source other than the surface impoundments or land treatment unit are responsible for the release, the release will be considered verified.

4. Preliminary Engineering Feasibility Study Report

The applicant shall, within 180 days of verification of a release or detection, submit to the California Energy Commission a Preliminary Engineering Feasibility Study pursuant to CCR, title 27, section 20420, subdivision (k)(6), that shall contain either corrective action measures that could be taken to achieve background concentration or demonstrate that the waste management units are not the cause of the detection.

V. REPORTING REQUIREMENTS

A. General Provisions

The applicant shall comply with the "General Provisions for Monitoring and Reporting" which is attached to and made part of this Monitoring and Reporting Program.

B. Semiannual Report

Beginning on June 30, 2011, a Semiannual Monitoring Report, including the preceding monitoring information, shall be submitted to the California Energy Commission. Subsequent semiannual monitoring reports shall be submitted to the California Energy Commission by January 30 and June 30 of each year.

C. Annual Report

Beginning on January 30, 2012, and by January 30 of each year, the applicant shall submit an Annual Report to the California Energy Commission including the preceding information and with the following information:

a. evidence that adequate financial assurance for closure, post-closure, and reasonably foreseeable releases is still in effect and may include a copy of the renewed financial instrument or a copy of the receipt for payment of the financial instrument;

b. evidence that the amount is still adequate or increase the amount of financial assurance by the appropriate amount if necessary, due to inflation, a change in the approved closure plan, or other unforeseen events; and

c. a review of the closure plan and a statement that the closure activities described are still accurate or an updated closure plan.

D. Data Analysis Report

The applicant shall, by **January 30 of every year**, submit to the California Energy Commission a Data Analysis Report as specified in Section III (Data Analysis) of this Monitoring and Reporting Program.

E. Electronic Submittal of Information

Pursuant to California Code of Regulations, title 23, section 3890, the applicant shall submit reports, including soil vapor and water data, prepared for the purpose of subsurface investigation or remediation of a discharge of waste to land subject to Division 2 of title 27 electronically over the internet to the State Water Resources Control Board's Geotracker system. This requirement is in addition to, and not superseded by, any other applicable reporting requirement.

GENERAL PROVISIONS

FOR MONITORING AND REPORTING

1. SAMPLING AND ANALYSIS

   a. All analyses shall be performed in accordance with the current edition(s) of the following documents:

      i. Standard Methods for the Examination of Water and Wastewater

      ii. Methods for Chemical Analysis of Water and Wastes, EPA

   b. All analyses shall be performed in a laboratory certified to perform such analyses by the California Department of Public Health Services or a laboratory approved by the California Energy Commission. Specific methods of analysis must be identified on each laboratory report.

   c. Any modifications to the above methods to eliminate known interferences shall be reported with the sample results. The methods used shall also be reported. If methods other than EPA-approved methods or Standard Methods are used, the exact methodology must be submitted for review and must be approved by the California Energy Commission.

   d. The applicant shall establish chain-of-custody procedures to insure that specific individuals are responsible for sample integrity from commencement of sample collection through delivery to an approved laboratory. Sample collection, storage, and analysis shall be conducted in accordance with an approved Sampling and Analysis Plan (SAP). The most recent version of the approved SAP shall be kept at the Facility.

   e. The applicant shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to ensure accuracy of measurements, or shall insure that both activities will be conducted. The calibration of any wastewater flow measuring device shall be recorded and maintained in the permanent log book described in 2.b, below.

   f. A grab sample is defined as an individual sample collected in fewer than 15 minutes.

2. OPERATIONAL REQUIREMENTS

   a. Sample Results

      The applicant shall maintain all sampling and analytical results including: strip charts; date, exact place, and time of sampling; date analyses were performed; sample collector's name; analyst's name; analytical techniques used; and results of all analyses. Such records shall be retained for a minimum of three years. This period of retention shall be extended during

the course of any unresolved litigation regarding this discharge, or when requested by the California Energy Commission.

b. Operational Log

An operation and maintenance log shall be maintained at the Facility. All monitoring and reporting data shall be recorded in a permanent log book.

3. REPORTING

a. For every item where the requirements are not met, the applicant shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time, and shall submit a timetable for correction.

b. The applicant shall provide a brief summary of any operational problems and maintenance activities to the California Energy Commission with each monitoring report. Any modifications or additions to, or any major maintenance conducted on, or any major problems occurring to the wastewater conveyance system, treatment facilities, or disposal facilities shall be included in this summary.

c. Monitoring reports shall be signed by:

i. In the case of a corporation, by a principal executive officer at least of the level of vice-president or their duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates;

ii. In the case of a partnership, by a general partner;

iii. In the case of a sole proprietorship, by the proprietor; or

iv. In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

d. Monitoring reports are to include the name and telephone number of an individual who can answer questions about the report.

C. CULTURAL RESOURCES

The potential for impacts to cultural resources depends upon whether such resources are present and whether they would actually be encountered during project development, construction, and operation activities. Cultural resource materials such as artifacts, structures, or land modifications reflect the history of human development. Certain places that are important to Native Americans or local national/ethnic groups are also considered valuable cultural resources. Analysis in this topic area pertains to the structural and cultural evidence of human development in the project vicinity as well as appropriate mitigation measures, should cultural resources be disturbed by project excavation, construction, or operation. The evidence on this matter was undisputed. (6/28/10 RT 64-76, 81, Exs. 1, § 5.4, Appendix D, 4 [Cultural Resources], 8, 16, 26 [Part III], 40, 48 [§§ 4.0, 5.0], 302, § 5.3.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Setting

The AMS project is proposed for a site southwest of Harper Lake, approximately 15 miles northwest of Barstow and nine miles northwest of the community of Hinkley. The 1,765 acre site is comprised of private property that was historically used as the Lockhart Ranch complex. The property served as an agricultural and cattle center for over sixty years and, in that capacity, has utilized water from ground wells. The surface of the project area is mapped to a large extent as “made land” or artificial fill resulting from extensive agricultural disturbance (Exs. 1, pp. 5.4-16 – 5.4-19, 302, pp. 5.3-4 -5.3-5.) The archaeological remains of the region’s prehistory are relatively scarce. Sparse scatters of stone tools and chipped stone tool manufacturing debris, and isolated artifacts, resources that typically yield information of marginal value, account for 40-60 percent of the archaeological remains found in the Mojave and Colorado deserts.

The evidentiary record reviews the prehistoric setting of the project area over the last 12,000 years. (Ex. 302, pp. 5.3-6 - 5.3-8.) The record also notes the ethnographic setting of the site, including past human occupation of the Central Mojave Desert was exploited by a variety of groups as well, including the Chemehuevi/Southern Paiute, the Mojave and possibly the Desert Kawaiisu. (Ex. 302, pp. 5.3-8 -5.3-9.)

The historic setting of the project area began in the late eighteenth century when Spanish padre Father Francisco Garces entered the area. Jedediah Smith was the first American known to cross the Mojave dessert in 1826, while the area was under the Mexican flag. The influence of the missions diminished through the 1830s, as their land holdings were privatized. The resulting ranchos, which primarily focused on cattle grazing, were important social and economic centers. Twenty ranchos were granted in northwestern Riverside and southwestern San Bernardino counties, covering almost 500,000 acres. The rancho industries, including cattle grazing and hides, was a catalyst for a population influx to California. (Exs, 302, pp. 5.3-9 – 5.3-10). However, the California Gold Rush changed the nature of the rancho cattle industry, placing more emphasis on the use of cattle for meat and other goods, rather than their hides. The influx of people created a cattle boom in the state.

Early wagon routes and regional railroads were integrated into permanent roadways with the 20th century arrival of the automobile. Coast-to-coast highway Route 66, established in 1926, passed through Barstow, located 15 miles southeast of the site.

Agriculture has long played a major role in the region. The early ranchos were subdivided and the Homestead Act of 1862 brought more farming to the region. However, agriculture was particularly challenging in the Mojave Desert, since the climate and geomorphology limited access to water. Regardless of these limitations, the region became a primary alfalfa producer. Early crops also included cashews, with both crops demanded an enormous amount of water and necessitated the drilling of deep wells. The limited accessibility to water combined with the Great Depression of the 1930s spelled the end for the original homesteads. Population in the area declined in the 1930s and 1940s, reviving for a few years in the 1950s due to cattle operations at the Lockhart Ranch, however, ranching operations eventually declined and in 1988 much of the ranch was purchased by Luz Development for installation of solar panels. A survey of the town of Lockhhart conducted in 1990, showed there were 41 standing buildings and structures associated with the complex. Since then, the majority of the buildings have been demolished. (Ex. 302, pp. 5.3-9 - 5.3-13.)

2. Method and Threshold for Determining Significance

CEQA requires a lead agency to determine first whether a project may impact a resource that falls within the definition of “historical resource” and second, whether any such impact will cause a substantial adverse change in the

significance of a historical resource and may therefore have a significant impact on the environment. We evaluate such resources by determining whether they meet several sets of specified criteria.

Under the CEQA Guidelines, a "historical resource" is:

- A resource included in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (CRHR);

- A resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting the requirements of Section 5024.1 (g) of the Public Resources Code; or

- Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record. [Cal. Code Regs., tit.14, § 15064.5(a).]

Consequently, under the CEQA Guidelines, a resource is generally considered historically significant if it meets the criteria for listing in the CRHR. These criteria are essentially the same as the eligibility criteria for the National Register of Historic Places (NRHP). In addition to being at least 50 years old,[39] a resource must meet at least one of the following criteria:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

- Is associated with the lives of persons important in our past;

- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

- Has yielded, or may be likely to yield, information important in history or prehistory. [Pub. Res. Code § 5024.1.]

[39] The Office of Historic Preservation's Instructions for Recording Historical Resources (1995) endorses recording and evaluating resources over 45 years of age to accommodate a five-year lag in the planning process.

In addition, historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. [Cal. Code Regs., tit. 14, § 4852(c).]

Historical resources automatically listed in the CRHR include California historical resources listed in or formally determined eligible for the NRHP and California Registered Historical Landmarks from No. 770 onward. [Pub. Res. Code, § 5024.1(d).] Notably, even if a resource is not listed or determined to be eligible for listing in the CRHR, CEQA allows a lead agency to determine that a resource is a historical resource as defined in Public Resources Code, sections 5020.1 (j) or 5024.1.

Developing an inventory of historical resources in and near a project area is the first step of the required resources analysis. The record shows that the efforts of the Applicant and Staff to develop the inventory included an investigatory phase comprised of a background research, consultation with local Native American communities, primary field research, and evaluating the significance of found cultural resources. (Ex. 302, p. 5.3-13.)

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. (Exs. 1, 5.4-19 – 5.4-23, 302, p. 5.3-13.)

The Applicant's consultant conducted a records search in August 2006 at the San Bernardino County Archaeological Information Center to identify any previous cultural resources studies and recorded historical resources within a 1-mile radius around the project area. The consultant also did a records search of 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. The consultant made a subsequent records search request in April 2009. No new records or repots were received after 2006.

A historic refuse scatter, cement slab and wood and cement-lined well and two historic refuse scatters were identified as previously recorded archaeological resources. The 2006 search also revealed six remaining and previously recorded architectural sites. (Ex. 302, pp. 5.3-15 - 5.3-15.)

The Applicant also initiated contact with local Native American groups and interested parties, however, a Sacred Lands File search reveal no specific site information within a 1-mile buffer of the project site. (Exs. 1, p. 5.4-32, Appendix D, 302, p. 5.3-15.)

3. CRHR Eligibility

The record shows that on the basis of background research and the results of the field efforts, the total cultural resources inventory for the project area includes 40 resources identified in the project area of analysis—26 archaeological sites and 14 built environment resources. One of the archaeological resources was prehistoric and the remaining 25 were from the historic period. Of those resources, 15 were identified within the project site with the potential to be impacted by the project. (Ex. 302, p. 5.3-22, Table 5.) These are listed in **Cultural Resources Table 1** below and described in greater detail in the Staff Assessment. (Exs. 1, pp. 5.4-25 -5.4-32, 302, pp. 5.3-22 to 5.3-29.)

Cultural Resources Table 1
Cultural Resources Subject to Project Effects

Resource Designation	***Resource Type***	***Staff Recommendation on CRHR eligibility***
P-36-021006	Prehistoric lithic scatter	CRHR-ineligible
P-36-021096	Historic/modern refuse scatter	CRHR-ineligible
P-36-021005	Historic refuse scatter, possible remnants of adjacent structure and corral	CRHR-ineligible
P-36-007429	Historic refuse scatter	CRHR-ineligible
P-36-020990	Refuse pile and adjacent historic scatter	CRHR-ineligible
P-36-020994	Cement lined reservoir, well, pump, three cement foundations, five cement stand pipes	CRHR-ineligible
P-36-021001	Historic/modern refuse scatter	CRHR-ineligible
P-36-021007	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	Residence	CRHR-ineligible
P-36-021011	Residence	CRHR-ineligible

There are, however, no CRHR-eligible resources within the AMS project area of analysis. (Ex. 302, p. 5.3-29.)

4. Construction and Operation Impacts and Mitigation

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. Indirect impacts to archaeological resources are generally those that result from increased erosion due to site clearance and preparation, or from inadvertent damage or vandalism to exposed resources.

The evidentiary records reveal that the potential for the discovery of buried archaeological deposits is moderate to high across the whole of the project site. The Applicant and Staff have each proposed 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. The measures are intended to mitigate potential impacts to archaeological resources that could be discovered during the construction of the proposed AMS project. Mitigation includes steps in five areas: 1) evaluation and documentation where resources cannot be avoided; 2) a mitigation plan to be implemented if a significant resource is encountered; 3) work crew education by monitoring archaeologists; 4) collection and curation of cultural materials and field notes; 5) work stoppage and special handling should human remains be encountered. (Ex. 302, pp. 5.3-31 -5.3-32.)

We have evaluated the Applicant's suggested mitigation measures and Staff's additional proposals in light of the evidence presented and based thereon, adopt Conditions of Certification **CUL-1** through **CUL-7.** **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** requires the Applicant to provide the CRS with all relevant cultural resources information and maps. **CUL-3** requires the CRS to write and submit to the Energy Commission Compliance Project Manager (CPM) a Cultural Resources Monitoring and Mitigation Plan (CRMMP). **CUL-4** requires the CRS to write and submit to the CPM a final report on all AMS cultural resources monitoring and mitigation activities. **CUL-5** requires 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** requires 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.

These mitigation measures 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.

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. 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. Neither the Applicant nor Staff identified any indirect impacts to any identified cultural resources in the impact areas of the proposed AMS project. (Exs. 1, pp. 5.4-36 – 5.4-41, 302, pp. 5.3-30-5.3-33.)

5. Operations Impacts

During project operation, if a leak should develop in the gas or water pipelines, repair could require excavation. This activity could impact previously unknown subsurface archaeological resources. Based on the evidence, we find that implementation of Conditions of Certification **CUL-1** through **CUL-7** discussed above will reduced any potential excavation-related impacts to a less than significant level. (Ex. 302, p. 5.3-33.)

6. Cumulative Impacts

A cumulative effect refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effects of the proposed project. (Pub. Res. Code § 21083, Cal. Code Regs., tit. 14, §§ 15064(h), 15065(c), 15130, and 15355.)

The evidence shows that the Applicant and Staff evaluated the potential cumulative impacts of the project combined with other closely related past, present, and reasonably foreseeable future projects. An initial step of the

evaluation was the identification of projects whose impacts may compound or increase the incremental effect. There are not currently any open applications for development projects within a 6-mile radius of the project and, as of the date the AFC was submitted, the nearest energy-related project is 43 miles away. (Ex. 302, pp. 5.3-33 -5.3-34.)

7. Public Comments

The record shows that one public comment was received on the topic of cultural resources. In particular, Mr. Glenn Maclean expressed concern that more analysis should be carried out on cultural significance of the Lockhart General Merchandise Store. The Lockhart General Merchandise Store is of a mass and scale that, when seen on site, has an enormous presence. As noted in the original evaluation, it is the largest building in the area. In response to the comment, Staff conducted additional analysis to determine whether, based on well established criteria, the store qualifies as a significant cultural resource under CEQA. The additional analysis contained in the record establishes that the store does not qualify. (Ex. 302, pp. 5.3-34 to 5.3-41.)

FINDINGS OF FACT

Based on the uncontroverted evidence of record, the Commission makes the following findings and reaches the following conclusions:

1. Cultural resources exist in the general project area of analysis.
2. Evidence of cultural resources analysis contained in the record establishes that the project has a moderate to high potential to have significant direct impacts on unknown buried prehistoric archaeological deposits.
3. The potential for impacts to unknown cultural resources may not be discovered until subsurface soils are exposed during excavation and construction. Implementation of Conditions of Certification **CUL-1** through **CUL-7** will facilitate identification and assessment of such resources and will mitigate any potential significant impacts to them. Included among these requirements is the obligation of the project owner to provide a Cultural Resources Specialist and archaeological monitors with authority to halt construction if unknown resources are discovered.
4. There are not currently any open applications for development projects within a 6-mile radius of the project and, as of the date the AFC was submitted, the nearest energy-related project is 43 miles away.

5. The low potential for cumulatively considerable impacts will be further reduced to less than cumulatively considerable with the implementation of Conditions of Certification **CUL-1** through **CUL-7.**

6. Construction and operation activities associated with the AMS project and related facilities will have no significant direct or indirect impacts on known or unknown archaeological, ethnographic, or built-environment resources, with the implementation of Conditions of Certification **CUL-1** through **CUL-7**.

CONCLUSIONS OF LAW

1. The Commission therefore concludes that with implementation of the Conditions of Certification below, the project will conform to all applicable laws, ordinances, regulations, and standards relating to cultural resources as set forth in the pertinent portion of **Appendix A** of this Decision.

2. The mitigation measures contained in the Conditions of Certification below ensure that any direct, indirect, or cumulative adverse impacts to cultural resources resulting from project-related activities will be insignificant.

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

Qualifications Standards, as published in Title 36, Code of Federal Regulations, part 61 (36 C.F.R., part 61). In addition, the CRS shall have the following qualifications:

1. The CRS's qualifications shall be appropriate to the needs of the project and shall include a background in anthropology, archaeology, history, architectural history, or a related field;

2. At least three years of archaeological or historical, as appropriate, resource mitigation and field experience in California; and

3. At least one year of experience in a decision-making capacity on cultural resources projects in California and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources.

The resumes of the CRS and alternate CRS shall include the names and telephone numbers of contacts familiar with the work of the CRS/alternate

CRS on referenced projects and demonstrate to the satisfaction of the CPM that the CRS/alternate CRS has the appropriate training and experience to implement effectively the Conditions.

CULTURAL RESOURCES MONITORS

CRMs shall have the following qualifications:

1. A B.S. or B.A. degree in anthropology, archaeology, historical archaeology or a related field and one year experience monitoring in California; or

2. An AS or AA degree in anthropology, archaeology, historical archaeology or a related field, and four years experience monitoring in California; or

3. Enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology or a related field, and two years of monitoring experience in California.

CULTURAL RESOURCES TECHNICAL SPECIALISTS

The resume(s) of any additional technical specialist(s), e.g., historical archaeologist, historian, architectural historian, and/or physical anthropologist, shall be submitted to the CPM for approval.

Verification: At least 45 days prior to the start of ground disturbance, the project owner shall submit the resume for the CRS, and alternate(s) if desired, to the CPM for review and approval.

At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval. At the same time, the project owner shall also provide to the proposed new CRS the AFC and all cultural resources documents, field notes, photographs, and other cultural resources materials generated by the project. If there is no alternate CRS in place to conduct the duties of the CRS, a previously approved monitor may serve in place of a CRS so that construction may continue up to a maximum of three days without a CRS. If cultural resources are discovered then construction will remain halted until there is a CRS or alternate CRS to make a recommendation regarding significance.

At least 20 days prior to ground disturbance, the CRS shall provide a letter naming anticipated CRMs for the project and stating that the identified CRMs meet the minimum qualifications for cultural resource monitoring required by this Condition. If additional CRMs are obtained during the project, the CRS shall provide additional letters to the CPM identifying the CRMs and attesting to the qualifications of the CRMs, at least five days prior to the CRMs beginning on-site duties.

At least 10 days prior to any technical specialists beginning tasks, the resume(s) of the specialists shall be provided to the CPM for review and approval.

At least 10 days prior to the start of ground disturbance, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources conditions.

CUL-2 Prior to the start of ground disturbance, if the CRS has not previously worked on the project, the project owner shall provide the CRS with copies of the AFC, data responses, and confidential cultural resources reports for the project. The project owner shall also provide the CRS and the CPM with maps and drawings showing the footprints of the power plant, all linear facilities, all access roads, and all laydown areas. Maps shall include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1” = 200’) for plotting cultural features or materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless such activities are specifically approved by the CPM.

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

At a minimum, the CRS shall consult weekly with the project construction manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

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

Verification:

At least 40 days prior to the start of ground disturbance, the project owner shall provide the AFC, data responses, and confidential cultural resources documents to the CRS, if needed, and the subject maps and drawings to the CRS and CPM. The CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities.

If there are changes to any project-related footprint, revised maps and drawings shall be provided at least 15 days prior to start of ground disturbance for those changes.

If project construction is phased, if not previously provided, the project owner shall submit the subject maps and drawings 15 days prior to each phase.

On a weekly basis during ground disturbance, a current schedule of anticipated project activity shall be provided to the CRS and CPM by letter, e-mail, or fax.

Within five days of identifying changes, the project owner shall provide written notice of any changes to scheduling of construction phase.

CUL-3 Prior to the start of ground disturbance, the project owner shall submit the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by or under the direction of the CRS, to the CPM for review and approval. The CRMMP shall be provided in the Archaeological Resource Management Report (ARMR) format, and, per ARMR guidelines, the author's name shall appear on the title page of the CRMMP. The CRMMP shall identify general and specific measures to minimize potential impacts to sensitive cultural resources. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, each CRM, and the project owner's on-site construction manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless such activities are specifically approved by the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures:

1. A proposed general research design that includes a discussion of archaeological research questions and testable hypotheses specifically applicable to the project area, and a discussion of

artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design. A prescriptive treatment plan may be included in the CRMMP for limited resource types. A refined research design will be prepared for any resource where data recovery is required.

2. The following statement included in the Introduction: “Any discussion, summary, or paraphrasing of the Conditions of Certification in this CRMMP is intended as general guidance and as an aid to the user in understanding the conditions and their implementation. The conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the conditions in the CRMMP. The Cultural Resources Conditions of Certification from the Commission Decision are contained in Appendix A.”

3. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the ground disturbance, construction, and post-construction analysis phases of the project.

4. Identification of the person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team.

5. A description of the manner in which Native American observers or monitors will be included, the procedures to be used to select them, and their role and responsibilities.

6. A description of all impact-avoidance measures (such as flagging or fencing) to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The description shall address how these measures would be implemented prior to the start of construction and how long they would be needed to protect the resources from project-related effects.

7. A statement that all cultural resources encountered shall be recorded on Department of Parks and Recreation (DPR) 523 forms and mapped and photographed. In addition, all archaeological materials retained as a result of the archaeological investigations (survey, testing, data recovery) shall be curated in accordance with the California State Historical Resources Commission’s *Guidelines for the Curation of Archaeological Collections*, into a retrievable storage collection in a public repository or museum.

8. A statement that the project owner will pay all curation fees for artifacts recovered and for related documentation produced during cultural resources investigations conducted for the project. The project owner shall identify three possible curation facilities that could accept cultural resources materials resulting from project activities.

9. A statement that the CRS has access to equipment and supplies necessary for site mapping, photography, and recovery of any cultural resource materials that are encountered during ground disturbance and cannot be treated prescriptively.

10. A description of the contents and format of the Cultural Resource Report (CRR), which shall be prepared according to ARMR guidelines.

Verification:

At least 30 days prior to the start of ground disturbance, the project owner shall submit the subject CRMMP to the CPM for review and approval.

At least 30 days prior to the start of ground disturbance, a letter shall be provided to the CPM indicating that the project owner agrees to pay curation fees for any materials collected as a result of the archaeological investigations (survey, testing, data recovery).

CUL-4 The project owner shall submit the Cultural Resources Report (CRR) to the CPM for approval. The CRR shall be written by or under the direction of the CRS and shall be provided in the ARMR format. The CRR shall report on all field activities including dates, times and locations, findings, samplings, and analyses. All survey reports, DPR 523 forms, and additional research reports not previously submitted to the California Historical Resource Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as an appendix to the CRR.

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

Verification:

Within 90 days after completion of ground disturbance (including landscaping), the project owner shall submit the CRR to the CPM for review and approval. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.

Within 90 days after completion of ground disturbance (including landscaping), the project owner shall provide to the CPM a copy of an agreement with, or other written commitment from, a curation facility that meets the standards stated in the California State Historical Resources Commission's *Guidelines for the Curation of Archaeological Collections*, to accept cultural materials, if any, from this project. Any agreements concerning curation will be retained and available for audit for the life of the project.

Within 10 days after CPM approval, the project owner shall provide documentation to the CPM confirming that copies of the CRR have been provided to the SHPO, the CHRIS, and the curating institution, if archaeological materials were collected.

Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRR to the CPM for review and approval.

CUL-5 Prior to and for the duration of ground disturbance, the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment at the project site, laydown area, and along the linear facilities routes. The training shall be prepared by the CRS, may be conducted by any member of the archaeological team, and may be presented in the form of a video. The CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance is completed or suspended, but must be resumed when ground disturbance, such as landscaping, resumes. The training shall include:

1. A discussion of applicable laws and penalties under the law;

2. Samples or visuals of artifacts that might be found in the project vicinity;

3. Instruction that the CRS, alternate CRS, and CRMs have the authority to halt construction in the area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;

4. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources discovery and shall contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;

5. An informational brochure that identifies reporting procedures in the event of a discovery;

6. An acknowledgement form signed by each worker indicating that they have received the training; and

7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

No ground disturbance shall occur prior to implementation of the WEAP program, unless such activities are specifically approved by the CPM.

Verification:

At least 30 days prior to the beginning of ground disturbance, the CRS shall provide the training program draft text and graphics and the informational brochure to the CPM for review and approval, and the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign.

On a monthly basis, until ground disturbance is completed, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of workers at the project site and on the linear facilities who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-6 The project owner shall ensure that the CRS, alternate CRS, or CRMs monitor full time all ground disturbance at the project site, and ground disturbance at laydown areas, roads, and other ancillary areas, to ensure there are no impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner.

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

In the event that the CRS believes that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the

justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.

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

On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of non-compliance with the Conditions and/or applicable LORS. Copies of the daily monitoring logs shall be provided by the CRS to the CPM, if requested by the CPM. From these logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended. The CRS or alternate CRS shall report daily to the CPM on the status of cultural resources-related activities at the construction site, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.

The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resources monitoring and mitigation activities with Energy Commission technical staff (Staff).

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

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

A Native American monitor shall be obtained to monitor ground disturbance in areas where Native American artifacts are discovered. Informational [contact] lists of concerned Native Americans and guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that shall be monitored. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall

immediately inform the CPM. The CPM will either identify potential monitors or will allow ground disturbance to proceed without a Native American monitor.

Verification:

At least 30 days prior to the start of ground disturbance, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log. While monitoring is on-going, the project owner shall include in each MCR a copy of the monthly summary report of cultural resources-related monitoring prepared by the CRS.

Daily, as long as no cultural resources are found, the CRS shall provide a statement that "no cultural resources over 50 years of age were discovered" to the CPM as an e-mail, or in some other form acceptable to the CPM. If the CRS concludes that daily reporting is no longer necessary, a letter or e-mail providing a detailed justification for the decision to reduce or end daily reporting shall be provided to the CPM for review and approval at least 24 hours prior to reducing or ending daily reporting.

At least 24 hours prior to implementing a proposed change in monitoring level, documentation justifying the change shall be submitted to the CPM for review and approval.

No later than 30 days following the discovery of any Native American cultural materials, the project owner shall submit to the CPM copies of the information transmittal letters sent to the Chairperson of the Native American tribes or groups who requested the information. Additionally, the project owner shall submit to the CPM copies of letters of transmittal for all subsequent responses to Native American requests for notification, consultation, and reports and records and any comments or information provided in response by the Native Americans.

CUL-7 The project owner shall grant authority to halt construction to the CRS, alternate CRS, and the CRMs in the event of a discovery. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event cultural resources over 50 years of age or, if younger, considered exceptionally significant are found, or impacts to such resources can be anticipated, ground disturbance shall be halted or redirected in the immediate vicinity of the discovery sufficient to ensure that the resource is protected from further impacts. Monitoring and daily reporting as provided in **CUL-6** shall continue during all ground-disturbing activities wherever project construction 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:

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.

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.

D. GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

This section of the Decision summarizes the record concerning the project's potential effects relating to geological and paleontological resources. Our evaluation in this subject area is guided by California Environmental Quality Act (CEQA) Guidelines, Appendix G. The evidence evaluates whether project-related activities could result in exposure to geological hazards, as well as whether the facility can be designed and constructed to avoid any such hazard which could impair its proper functioning. These include faulting and seismicity, liquefaction, dynamic compaction, hydrocompaction, subsidence, expansive soils, landslides, tsunamis, and seiches. Next, the evidence assesses whether the project will impact any geologic or mineralogical resources. Finally, the analysis of record examines whether fossilized remains or trace remnants of prehistoric plants or animals are likely to be present at the site and, if so, whether the project's potential impacts to these resources are adequately mitigated. The parties did not dispute any matters in this discipline nor did any member of the public commented on geological and paleontological resources. (6/28/10 RT 64-76, 81, Exs. 1, § §5.5, 5.9, 5.12, Appendixes B and E; 2, 3 [Item 75], 48 [§ 16.0]; 300, §6.2.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Site Description

The project site is located within the structurally defined Eastern California Shear Zone (ECSZ), and lies near the southwest edge of Harper Lake on land formerly used for irrigated agriculture. Overall, the proposed site slopes northeast toward the local topographic low at Harper Lake. The geotechnic evaluation for the project indicates the surface soils are "generally compressible" (Ex. 1, p. 5.5-7.) The proposed AMS plant site is not crossed by any known active faults, but a designated Alquist-Priolo Earthquake Fault Zone (EFZ, formerly called Special Studies Zones) is delineated in the northeastern part of the property (Ex. 300, p. 6.2-5.). No evidence for active faulting was found during trenching studies. However, a number of major, active faults lie within 62 miles of the site. (*Id*.; Ex. 1, p. 5.5-9, Table 5.5-4.)

2. Geologic Hazards

The evidentiary record contains documentation of potential geologic hazards at the proposed AMS plant site, including site-specific subsurface information. (Exs. 1, § 5.5, § 6.2-8 – 6.2-14.) The record establishes that the potential for geologic hazards to impact the proposed plant site during its design life would be low if recommendations for mitigation of seismic shaking, liquefaction, and settlement due to compressible soils are followed. Ground shaking, liquefaction, and subsidence due to compressible soils represent the main geologic hazards at the proposed site. These potential hazards could be effectively mitigated through facility design by incorporating recommendations contained in the project geotechnical evaluation. Proposed Conditions of Certification **GEN-1, GEN-5,** and **CIVIL-1** in the **Facility Design** section will also mitigate these impacts to a less than significant level. (Ex. 300, p. 6.2-7.)

Evidence was also received regarding the risks of active faulting and seismicity in the project area. (Ex. 1, pp. 5.5-8 – 5.5-9, 300, p. 6.2-10, Table 2.) Twenty-eight Type A and B faults and fault segments were identified within 62 miles of the AMS site[40]. Of these, four are within 15 miles of the site. However, although four of the many fault segments analyzed lie within 15 miles of the project site, a fault investigation did not reveal the presence of an active fault in the Earthquake Fault Zone (EFZ). Nevertheless, events such as the Landers earthquake (magnitude 7.3), which occurred on June 28, 1992, approximately 62 miles from the AMS site, demonstrate that the proposed site could be subject to intense levels of earthquake-related ground shaking in the future. The effects of strong ground shaking would be mitigated, to the extent practical, through structural designs required by the California Building Code (CBC) and the site-specific project geotechnical report. (Ex. 300, p. 6.2-11.)

The estimated bedrock peak horizontal ground acceleration (Site Class B) for the power plant is 0.50 times the acceleration of gravity (0.50g). Based on drilling data, including standard penetration resistance blowcounts, and on the soil profile generated for the site by the geotechnical evaluation, the soils at the proposed AMS site were determined to be Site Class D. (Ex. 300, p. 6.2-11). Buildings and structures are required to be designed with adequate strength to resist the effects of Design Earthquake Ground Motion, as defined by the CBC. Facility Design Condition of Certification **GEN-1** addresses the potential for

[40] Type A faults have slip-rates of $\geq$5 mm per year and are capable of producing an earthquake of magnitude 7.0 or greater. Type B faults have slip-rates of 2 to 5 mm per year and are capable of producing an earthquake of magnitude 6.5 to 7.0. The fault type, potential magnitude, and distance from the site are summarized in Ex. 300, p. 6.2-10, Geology and Paleontology Table 2.

strong ground shaking. Proper design in accordance with this condition, as well as with requirements presented in the site-specific, design-level geotechnical evaluation, should adequately mitigate seismic hazards to the current standards of practice.

Liquefaction is a condition in which a saturated cohesionless soil may lose shear strength because of a sudden increase in pore water pressure caused by an earthquake. The geotechnical evaluation for the AMS project indicates that potentially liquefiable sandy beds are present in areas of the subsurface where perched ground water is present. Differential settlement was calculated to be ½ inch and ¾ inch over a horizontal distance of 40 feet at the Alpha and Beta power blocks, respectively (Ex. 1, p. 5.5-10, 300, p. 6.2-12.) Therefore, there would be a potential for liquefaction-induced settlement beneath the site during strong seismic events. Measures to mitigate potential catastrophic damage due to liquefaction are presented in the site specific geotechnical evaluation. Liquefaction potential on the proposed AMS site is also addressed, and mitigated, in the proposed Condition of Certification **GEN-1** requirements.

The evidence also contains analyses of risk to the project from lateral spreading, dynamic compaction, hydrocompaction, subsidence, expansive soils, landslide, flooding tsunamis, and volcanic hazards. None of these geologic phenomena pose a significant risk to the AMS project. (Ex. 31, pp. 5.5-8 – 5.5-5.5-11, pp. 6.2-12 - 6.2-14.)

3. Geologic, Mineralogic, and Paleontologic Resources[41]

The proposed AMS site is not located within an established Mineral Resource Zone (MRZ) and no economically viable mineral deposits are known to be present at the site. (Ex. 1, pp. 5.5-11, 5.9-7, 300, pp. 6.2-14 - 6.2-16.) Construction of the project has the potential to result in the destruction of surface or subsurface paleontological resources via breakage and crushing due to ground disturbance activities. However, the majority of the project area is immediately underlain by a previously disturbed surface with a low paleontologic sensitivity. Because the upper 1 to 2 feet of the surface of the proposed AMS

[41] Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics in an effort to understand the history of life on earth. Paleontologic resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. Fossils are considered nonrenewable resources because the organisms they represent no longer exist. Once destroyed, a fossil record can never be replaced. (Ex. 1, p. 5.9-1.)

site is disturbed, the material is unlikely to contain significant paleontological resources within their natural context. Based on the recorded fossil finds, the evidence establishes that the paleontological resource sensitivity of undisturbed Quaternary alluvium and lacustrine sediments varies from low at shallow depths to very high at greater depths. (*Id*.)

In order to reduce potential significant impacts to subsurface resources during deeper construction-related excavations, we have adopted Conditions of Certification **PAL-1** to **PAL-7**. These conditions are designed to mitigate paleontological resource impacts to less than significant levels. They would essentially require a worker education program in conjunction with the monitoring of earthwork activities by a qualified professional paleontologist (a paleontologic resource specialist, or PRS). Earthwork would be halted any time potential fossils are recognized by either the paleontologist or the worker. A PRS would be retained, for the project by the Applicant to produce a monitoring and mitigation plan, conduct the worker training, and provide the monitoring.

Thus, the evidence establishes that once constructed, the operation of the proposed new solar energy generating facility should not have any adverse impact on geologic, mineralogic, or paleontologic resources. In addition, there is no evidence of geologic hazards arising due to cumulative effects related to the AMS project.

FINDINGS OF FACT

Based on the uncontroverted evidence, we make the following findings:

1. The project is located in an active geologic area of the north-central Mojave Desert geomorphic province in southwest San Bernardino County in south-central California.

2. Intense levels of earthquake-related ground shaking and settlement due to earthquake-related liquifaction are the main geologic hazards which could affect the AMS project.

3. The evidentiary record contains a geotechnical evaluation and presents standard engineering design recommendations for mitigation of seismic shaking and site soil conditions applicable to the project site.

4. Potential geologic hazards to the project are effectively mitigated by standard engineering design measures as specified in Conditions **GEN-1, GEN-5,** and **CIVIL-1** of the **Facility Design** section of this Decision.

5. Lateral spreading, dynamic compaction, hydrocompaction, landslides, flooding, tsunamis, and seiches pose low or negligible project risks.

6. The AMS site is not located within an established Mineral Resource Zone (MRZ) and no economically viable mineral deposits are known to be present at the site

7. There is no evidence of existing or potential geological or mineralogical resources at the project site or along the linear alignments.

8. There are no known paleontological resources on the project site.

9. Because the upper 1 to 2 feet of the surface of the proposed AMS site is disturbed, the material within that depth is unlikely to contain significant paleontological resources within their natural context and is assigned a negligible paleontological sensitivity rating.

10. However, at depths of 2 feet below the surface, mass grading, deep foundation excavation, and utility trenching that penetrates underlying undisturbed soils holds a high potential for exposure of paleontological resources, until determined otherwise by the project paleontological resource specialist.

11. The project owner will implement several mitigation measures to avoid impacts to any paleontological resources discovered, including worker education, preparing a Paleontological Monitoring and Mitigation Plan, and having a Paleontologic Resource Specialist on-site. These mitigation measures are found in Conditions of Certification **PAL-1** through **PAL-7,** below.

12. The facility could be designed and constructed to minimize the effect of geologic hazards and impacts to potential paleontological resources at the site during project design life.

13. No geologic hazards which would arise due to cumulative effects during operation of the proposed facility were identified.

CONCLUSIONS OF LAW

1. The Conditions listed below ensure that project activities will not cause significant adverse direct, indirect, or cumulative impacts to geological, mineralogical, or paleontological resources.

2. Compliance with the Conditions of Certification specified below will ensure that the Abengoa Mojave Solar Project conforms to all applicable laws,

ordinances, regulations, and standards related to geological, mineralogical, and paleontological resources as identified in **Appendix A** of this Decision.

CONDITIONS OF CERTIFICATION

PAL-1 The project owner shall provide the compliance project manager (CPM) with the resume and qualifications of its paleontological resource specialist (PRS) for review and approval. If the approved PRS is replaced prior to completion of project mitigation and submittal of the Paleontological Resources Report, the project owner shall obtain CPM approval of the replacement PRS. The project owner shall keep resumes on file for qualified paleontological resource monitors (PRMs). If a PRM is replaced, the resume of the replacement PRM shall also be provided to the CPM.

The PRS resume shall include the names and phone numbers of references. The resume shall also demonstrate to the satisfaction of the CPM the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontology (SVP) guidelines of 1995. The experience of the PRS shall include the following:

1. Institutional affiliations, appropriate credentials, and college degree;
2. Ability to recognize and collect fossils in the field;
3. Local geological and biostratigraphic expertise;
4. Proficiency in identifying vertebrate and invertebrate fossils; and
5. At least three years of paleontological resource mitigation and field experience in California and at least one year of experience leading paleontological resource mitigation and field activities.

The project owner shall ensure that the PRS obtains qualified paleontological resource monitors to monitor as he or she deems necessary on the project. Paleontologic resource monitors (PRMs) shall have the equivalent of the following qualifications:

- BS or BA degree in geology or paleontology and one year of experience monitoring in California; or
- AS or AA in geology, paleontology, or biology and four years' experience monitoring in California; or

- Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

Verification:

(1) At least 60 days prior to the start of ground disturbance, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.

(2) At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project, stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM. The letter shall be provided to the CPM no later than one week prior to the monitor's beginning on-site duties.

(3) Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

PAL-2 The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant, construction lay-down areas, and all related facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and plan and profile drawings for the utility lines would be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and be at a scale between 1 inch = 40 feet and 1 inch = 100 feet. If the footprint of the project or its linear facilities changes, the project owner shall provide maps and drawings reflecting those changes to the PRS and CPM.

If construction of the project proceeds in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Before work commences on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent or construction field manager to confirm area(s) to be worked the following week and until ground disturbance is completed.

Verification:

(1) At least 30 days prior to the start of ground disturbance, the project owner shall provide the maps and drawings to the PRS and CPM.

(2) If there are changes to the footprint of the project, revised maps and drawings shall be provided to the PRS and CPM at least 15 days prior to the start of ground disturbance.

(3) If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within five days of identifying the changes.

PAL-3 The project owner shall ensure that the PRS prepares, and the project owner submits to the CPM for review and approval, a paleontological resources monitoring and mitigation plan (PRMMP) to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting, and sampling activities and may be modified with CPM approval. This document shall be used as the basis of discussion when on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of Vertebrate Paleontology (SVP 1995) and shall include, but not be limited, to the following:

1. Assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking, construction monitoring, mapping and data recovery, fossil preparation and collection, identification and inventory, preparation of final reports, and transmittal of materials for curation will be performed according to PRMMP procedures;

2. Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and the conditions of certification;

3. A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;

4. An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different

sampling procedures that shall be used for fine-grained and coarse-grained units;

5. A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed plan for monitoring and sampling;

6. A discussion of procedures to be followed in the event of a significant fossil discovery, halting construction, resuming construction, and how notifications will be performed;

7. A discussion of equipment and supplies necessary for collection of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;

8. Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meet the Society of Vertebrate Paleontology's standards and requirements for the curation of paleontological resources;

9. Identification of the institution that has agreed to receive data and fossil materials collected, requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution; and

10. A copy of the paleontological conditions of certification.

Verification: At least 30 days prior to ground disturbance, the project owner shall provide a copy of the PRMMP to the CPM. The PRMMP shall include an affidavit of authorship by the PRS and acceptance of the PRMMP by the project owner evidenced by a signature.

PAL-4 Prior to ground disturbance and for the duration of construction activities involving ground disturbance, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for the following workers: project managers, construction supervisors, foremen, and general workers involved with or who operate ground-disturbing equipment or tools. Workers shall not excavate in sensitive units prior to receiving CPM-approved worker training. Worker training shall consist of an initial in-person PRS training, or may utilize a CPM-approved video or other presentation format, during the project kick off for those mentioned above. Following initial training, a CPM-approved video or other approved training presentation/materials, or in-person training may be used for new employees. The training program may be combined with other training programs prepared for cultural and

biological resources, hazardous materials, or other areas of interest or concern. No ground disturbance shall occur prior to CPM approval of the Worker Environmental Awareness Program (WEAP), unless specifically approved by the CPM.

The WEAP shall address the possibility of encountering paleontological resources in the field, the sensitivity and importance of these resources, and legal obligations to preserve and protect those resources.

The training shall include:

1. A discussion of applicable laws and penalties under the law;

2. Good quality photographs or physical examples of vertebrate fossils for project sites containing units of high paleontologic sensitivity;

3. Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;

4. Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;

5. An informational brochure that identifies reporting procedures in the event of a discovery;

6. A WEAP certification of completion form signed by each worker indicating that he/she has received the training; and

7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification:

(1) At least 30 days prior to ground disturbance, the project owner shall submit the proposed WEAP, including the brochure, with the set of reporting procedures for workers to follow.

(2) At least 30 days prior to ground disturbance, the project owner shall submit the training program presentation/materials to the CPM for approval if the project owner is planning to use a presentation format other than an in-person trainer for training.

(3) If the owner requests an alternate paleontological trainer, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval prior to installation of an alternate trainer. Alternate trainers shall not conduct training prior to CPM authorization.

(4) In the monthly compliance report (MCR), the project owner shall provide copies of the WEAP certification of completion forms with the names of those trained and the trainer or type of training (in-person or other approved presentation format) offered that month. The MCR shall also include a running total of all persons who have completed the training to date.

PAL-5 The project owner shall ensure that the PRS and PRM(s) monitor consistent with the PRMMP all construction-related grading, excavation, trenching, and augering in areas where potential fossil-bearing materials have been identified, both at the site and along any constructed linear facilities associated with the project. In the event that the PRS determines full-time monitoring is not necessary in locations that were identified as potentially fossil bearing in the PRMMP, the project owner shall notify and seek the concurrence of the CPM.

The project owner shall ensure that the PRS and PRM(s) have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1. Any change of monitoring from the accepted schedule in the PRMMP shall be proposed in a letter or email from the PRS and the project owner to the CPM prior to the change in monitoring and will be included in the monthly compliance report. The letter or email shall include the justification for the change in monitoring and be submitted to the CPM for review and approval.

2. The project owner shall ensure that the PRM(s) keep a daily monitoring log of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.

3. The project owner shall ensure that the PRS notifies the CPM within 24 hours of the occurrence of any incidents of non-compliance with any paleontological resources conditions of certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.

4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM within 24 hours, or Monday morning in the case of a weekend event, where construction has been halted because of a paleontological find.

The project owner shall ensure that the PRS prepares a summary of monitoring and other paleontological activities placed in the monthly compliance reports. The summary will include the name(s) of PRS or

PRM(s) active during the month; general descriptions of training and monitored construction activities; and general locations of excavations, grading, and other activities. A section of the report shall include the geologic units or subunits encountered, descriptions of samplings within each unit, and a list of identified fossils. A final section of the report will address any issues or concerns about the project relating to paleontologic monitoring, including any incidents of non-compliance or any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the report shall include an explanation in the summary as to why monitoring was not conducted.

Verification: The project owner shall ensure that the PRS submits the summary of monitoring and paleontological activities in the MCR. When feasible, the CPM shall be notified 10 days in advance of any proposed changes in monitoring different from the plan identified in the PRMMP. If there is any unforeseen change in monitoring, the notice shall be given as soon as possible prior to implementation of the change.

PAL-6 The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed including collection of fossil materials, preparation of fossil materials for analysis, analysis of fossils, identification and inventory of fossils, the preparation of fossils for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during project construction.

Verification: The project owner shall maintain in his/her compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after project completion and approval of the CPM-approved paleontological resource report (see Condition of Certification **PAL-7**). The project owner shall be responsible for paying any curation fees charged by the museum for fossils collected and curated as a result of paleontological mitigation. A copy of the letter of transmittal submitting the fossils to the curating institution shall be provided to the CPM.

PAL-7 The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground-disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information and submit it to the CPM for review and approval.

The report shall include, but is not limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to

paleontological resources have been mitigated below the level of significance.

Verification: Within 90 days after completion of ground-disturbing activities, including landscaping, the project owner shall submit the PRR under confidential cover to the CPM.

VII. LOCAL IMPACT ASSESSMENT

The effect of a power plant project on the local area depends upon the nature of the community and the extent of the associated impacts. Technical topics discussed in this portion of the Decision consider issues of local concern including **Land Use, Noise, Socioeconomics, Traffic and Transportation, and Visual Resources.**

A. LAND USE

The land use analysis focuses on two main issues: (1) whether the project is consistent with local land use plans, ordinances, and policies; and (2) whether the project is compatible with existing and planned uses. The evidence on land use was undisputed. (6/28/10 RT 64-76, 8, Exs. 1, §5.7, 2, 3 [Land Use], 5 [Items 78 – 80], 26 [Land Use], 42, 43, 48 [§6.0] 302, § 5.5.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

According to CEQA Guidelines [Cal. Code Regs., tit. 14, §§ 15000 et seq., Appen. G, §§ II, IX, XVII], a project results in significant land use impacts if it would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program (FMMP) of the California Resources Agency, to non-agricultural use;
- Conflict with existing zoning for agricultural use or a Williamson Act contract;
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural uses;
- Physically disrupt or divide an established community;
- Conflict with any applicable habitat conservation plan or natural community conservation plan;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction, or that would normally have jurisdiction, over the project. This includes, but is not limited to, a General Plan, community or specific plan, local coastal program, airport land use compatibility plan, or zoning ordinance; or

- Create individual environmental effects which, when considered with other impacts from the same project or in conjunction with impacts from other closely related past, present, and reasonably foreseeable future projects, are considerable, compound, or increase other environmental impacts.

1. The Site

The proposed AMS project site will be on 1,765 acres of privately–owned land, located nearly nine miles northwest of the community of Hinkley in unincorporated San Bernardino County. The existing Solar Electric Generating Stations (SEGS) VIII and IX facilities, now owned by NextEra™ Energy Resources, are located immediately northwest of the project site.

The project site was historically used as the Lockhart Ranch complex. The property once served as an agricultural and cattle center and used water from ground wells. Past farming activities included flood irrigation and the pivot system of irrigation of quarter section areas. There are currently no ranching or residential activities on the property; however, one active pivot irrigation field is in use on the site. This crop circle is irrigated and producing alfalfa. The remainder of the site is largely non-irrigated former agricultural land that has been grazed by cattle, disturbed, or is now fallow.

The AMS site is surrounded by open space, rural residences and farms. Approximately 10 rural residences and farms are within one mile of the site.

Other land uses in the surrounding area include Harper Dry Lake and a viewing area, which are approximately 1,000 feet east of the project site. According to the U.S. Bureau of Land Management (BLM), water runoff from neighboring land uses has created a large marsh that attracts resident wildlife and various birds to what has become a prime bird watching area.

The project site is not located in an area that is under a Williamson Act contract. Nor is it subject to any Habitat or Natural Community Conservation Plan or within the boundaries of any wildlife preserve or critical habitat area. (Exs. 1, pp. 5.7-1, 5.7-15 – 5.7-17; 302, p. 5.5-4.)

2. Potential Impacts

a. Conversion of Farmland.

The currently irrigated crop circle used for alfalfa production is comprised of 128 acres. Even though a small portion of the 1,765-acre project site is irrigated and

used for agricultural production, we must nonetheless determine whether the proposed project will create environmental impacts to agricultural resources and if so, whether those impacts are significant. In making this determination, we are guided by CEQA Guidelines, Appendix G, the California Department of Conservation's FMMP mapping system, the United States Department of Agriculture Soil Classification Service (NRCS) soil type classifications, and the California Department of Conservation Land Evaluation and Site Assessment (LESA) Model.

We find that under the FMMP mapping system, which provides statistics on the conversion of farmland to non-agricultural uses in San Bernardino County, the AMS site contains 71 acres of "Prime Farmland" and 57 acres of "Farmland of Statewide Importance." (Exs. 1, p. 5.7-5; 302, p. 5.5-4.) These 128 acres of Farmland are the irrigated alfalfa crop circle.

The evidence shows that Staff and the Department of Conservation independently ran the LESA Model based on NRCS designations of the soils found on the AMS site. NRCS designates 882.5 acres of the site (approximately 50 percent) as Farmland of Statewide Importance, 706 acres of the site (approximately 40 percent) as Prime Farmland *if irrigated,* and 176.5 acres of the site (approximately 10 percent) as Not Prime Farmland. (Ex. 302, pp. 5.5-4 - 5.5-5.)

The model is composed of six different factors. Two Land Evaluation (LE) factors relate to measures of soil resource quality. Four Site Assessment (SA) factors relate to measures of the project's size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands. Each factor 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. This single score is applied to the following LESA significance thresholds:

- 0 to 39 Points - Not Significant
- 40 to 59 Points - Significant *only if* LE and SA subscores are each greater than or equal to 20 points
- 60 to 79 Points -Significant unless either LE or SA subscore is less than 20 points
- 80 to 100 Points – Significant (Exs. 302, p. 5.5-5, Appendix LU-1, DOC 1997, Table 9).

Staff ran the LESA Model twice. In both instances, the Model indicated that the project would have significant impacts to 1588.5 acres of agricultural lands comprised of Farmland of Statewide Importance and Prime Farmland. (Ex. 302, pp. 5.5-7 – 5.5-10, Appen. LU-1.)

Staff's first application of the Model, as summarized in the Staff Assessment, resulted in an overall score of 58.98. This analysis included a water availability score of 100 based on Staff's initial understanding of water availability and quality. (Ex. 302, p. 5.5-8.)

Staff received comments on the LESA results and its recommendation that the project owner mitigate impacts to 1588.5 acres at a one to one ratio. The comments collectively suggested that Staff reevaluate water resource availability and quality. (Ex. 302, pp. 5.5-27 – 5.5-31.) The evidence shows that Staff, in light of these comments, reevaluated water resource availability based on the information summarized in the **Soil and Water Resources** section of this Decision, particularly information pertaining to the Mojave Basin Area Adjudication (Adjudication) and water quality. (Ex. 302, pp. 5.5-8 - 5.5-9.)

Staff performed a second LESA analysis based in significant part on its determination that the Adjudication and implementation of the Adjudication imposes physical and economic restrictions on water availability during both drought and non-drought years. Staff applied a reduced water availability score of 65 to its analysis. Even with this revised water score, the resulting cumulative score was 54.64 (with an LE score of 29.89 and SA score of 24.75), resulting in a determination of significant impacts to 1588.5 acres of Farmland. (Ex. 302, p 5.5-9, Appen. LU-1.)

Even though we have regularly looked to the LESA Model and significance thresholds to inform our analysis of impacts to agricultural land, the Model provides us with an *optional* methodology to evaluate the impacts of agricultural land conversion. (Pub. Res. Code, § 21095). We are not bound by the LESA Model and its thresholds. In this proceeding, we find that sole reliance on the LESA Model would preclude the necessary task of evaluating the totality of facts and circumstances regarding water availability, quality, and the viability of agricultural production on the project site. Moreover, we recognize that subjective interpretation and weighing of the evidence can yield different results under the Model even when performed by experienced and knowledgeable individuals.

Thus, we independently reviewed the evidence presented and made the following determinations regarding the impacts to the AMS site's agricultural lands based on the proposed groundwater source:

- The HVGB is the water supply source. Water allocation and supply in the HVGB is administered under the terms of the Adjudication.

- The Adjudication establishes pumping rights and limits the amount of groundwater that can be pumped.

- Under the Adjudication, the volume of groundwater that can be pumped in the AMS project area without added replacement costs has already been reduced by 20 percent.

- Because water levels continue to decline in the HVGB, groundwater pumping can be further limited under the Adjudication to reduce the amount of overdraft. These limitations can reasonably result in a reduction in the acerage that can be irrigated for agricultural purposes.

- Much of the agricultural land on the AMS site has been retired and groundwater levels have begun to recover. If alfalfa production was to resume on this retired land, overpumping would continue and an additional reduction of the groundwater us right would likely be implemented under the Adjudication. This additional reduction would affect how much land could be used for agricultural production.

- The water at the AMS site is brackish and would be physically and economically restrictive to most productive farming activities, with the exception of the currently used 128 acre crop circle. (Exs. 1, § 5.7, 302, §§ 5.5, 5.9.)

Based on all of the foregoing evidence, we have determined that strict adherence to the LESA model in this instance would require mitigation that outweighs and is broader in scope than the potential farmland conversion impacts.

We concur with Staff's and the Applicant's recommendation that we apply the significance criteria set forth in CEQA Guidelines Appendix G, which focuses on the results of FMMP mapping. Under the FMMP mapping system the AMS project will convert 71 acres of Prime Farmland and 57 acres of Farmland of Statewide Importance. The impacts to the 128 acres are significant and must be mitigated.

We have therefore adopted Condition of Certification **LAND-1**. This proposed condition requires the project owner to purchase farmland and/or easements through a land conservancy on a one-to-one ratio and would help ensure that agricultural lands of the same or higher quality are conserved. The evidence shows that this mitigation is reasonably feasible and would reduce the impacts to a less than significant level.

b. Division of Existing Community.

The AMS project is surrounded by rural residential and agricultural land, habitat conservation areas, and SEGS VIII and IX. Ten scattered rural residences and farms are located within a one-mile radius of the proposed site, but none are located within any established residential communities or developments. As a result, the project will not require their relocation.

The plant will be located entirely on private property in an unincorporated area San Bernardino County. No existing roadways or pathways would be removed from service due to the project. Nor will off-site linear facilities be constructed as a result of the proposed project.

As such, implementation of the proposed project will not physically divide an existing or established community. (Exs. 1, p. 5.7-18; 302, p. 5.5-10.)

c. Conflict with Habitat or Conservation Plan.

The AMS site is not subject to a Habitat Conservation Plan or natural Community Conservation Plan. Nor is it within the boundaries of a wildlife preserve or critical habitat area. (Ex. 1, p. 5.7-21.)

3. Consistency with Local Land Use LORS.

As discussed above, the AMS site is within in an unincorporated area of San Bernardino County. The County General Plan and Development Code govern property use within the jurisdiction. The County has a “one-map approach” for both the General Plan land use designations and zoning classifications to ensure land use consistency between the county’s General Plan and its zoning code. The land use and zoning designations for the project site are both Rural Living (RL), which allows residential, agricultural, and open space uses.

RL development allows one unit per 2-1/2 acres with a 2-1/2 gross acre parcel size; 20 percent maximum building coverage; and a 35-foot height limit. (Exs. 1, p. 5.7-8; 302, pp.5.5-6, 5.5-11, Land Use Table 2.) Electrical power generation is allowed in a RL zone subject to a Conditional Use Permit.

The independently-operable Alpha and Beta solar fields will occupy 884 and 800 acres, respectively, of the project site, with each field using approximately 710 acres for solar thermal collector arrays. These two plant sites will exceed the 20 percent maximum building coverage for the RL zone. In addition, new

steel/concrete mono-poles for the transmission lines are expected to average approximately 80 feet in height (maximum pole height of 110 feet), which would exceed the 35-foot RL zone height limit.

The project would be consistent with the General Plan and RL zoning designation with a County-issued conditional use permit or variance. However, because the AMS project is under the exclusive permitting authority of the Energy Commission, our permitting requirements will stand in the place of the County requirements. To ensure consistency with County policies and development requirements, Staff solicited County input regarding development standards (e.g., for height, lot coverage, landscaping etc.), and received suggested Conditions of Approval. The County and indicated that the project would require a Major Variance under County Development Code Chapter 85.17. (Ex. 302, p. 5.5-13.)

Based on information received from the County, we find that the following four elements for approving a variance are satisfied for the AMS project:

(1) Granting the variance will not be materially detrimental to other properties or land uses in the area and will not substantially interfere with the present or future ability to use solar energy systems. With implementation of the mitigation measure contained in this Decision, allowing the AMS will not be materially detrimental to surrounding properties or land uses. Furthermore, SEGS VIII and IX are existing solar facilities adjacent to the northern boundary of the proposed project site. The remaining surrounding area consists largely of open space and scattered rural residences.

The AMS project will not interfere with the ability to use solar energy systems. Instead, the project will contribute to achieving and supporting the State's electric utility requirements with the long term production of renewable electric energy. (Exs. 1, p. 5.7 -19; 302, pp. 5.5-22 – 5.5-23.)

(2) There are exceptional or extraordinary circumstances or conditions applicable to the AMS site and project that do not apply to other properties in the same vicinity and land use zoning district. The evidence shows that the AMS project includes technology not contemplated by the County's standards. Thus, the project represents an exceptional circumstance or condition that does apply to other properties in the vicinity or zoning district. (Exs. 302, pp. 5.5-11, 5.5-22 – 5.5-23.)

(3) Strict application of the land use zoning district deprives the AMS site property of privileges enjoyed by other properties in the vicinity or in the same land use zoning district. It can be reasonably inferred from the evidence presented that the adjacent SEGS VIII and IX solar facilities

have enjoyed privileges such as a relief from strict compliance with RL zone development standards. Indeed, the evidence shows that it was not until 2010 that the County even adopted Chapter 84.29 of its Development Code relating to renewable energy generation facilities. (Ex. 302, pp. 5.5-12 – 5.5-14.)

(4) Granting the variance is compatible with the maps, objectives, policies, programs, and general land uses specified in the General Plan and any applicable specific plan. The evidence shows that the AMS project would not require changes to any applicable County LORS. Therefore, the granting of a variance would be compatible the maps, objectives, policies, programs, and general land uses specified in the County's General Plan and the Development Code. (Ex. 302, pp. 5.5-12 – 5.5-14.)

Furthermore, local LORS compliance will be attained with implementation of Condition of Certification **LAND-2**. This requires the project owner to comply with the County's suggested Conditions of Approval regarding project closure and decommissioning and the County Development Code Chapter 84.29.060, Decommissioning Requirements. (Ex. 302, pp. 5.5-10 – 5.5-23.)

4. Consistency with Subdivision Map Act

The State's Subdivision Map Act also applies to the AMS site and requires the project owner to merge or otherwise combine the 14 parcels over which it has site control, in order for the project to be located on a single legal parcel. (Gov. Code, § 66410 et seq; Ex. 302, p. 5.5-13- 5.5-14.) Staff contends that there are no exceptions and recommends Condition of Certification **LAND-3**, which would ensure that the project complies with the Subdivision Map Act and site control expectations.

5. Land Use Compatibility

We also considered the proposed project's compatibility with other existing land uses in the same setting. Land use compatibility refers to the physical compatibility of planned and existing land uses. As discussed above, the project site is designated RL for zoning and development purposes and is within an area that primarily consists of open space and scattered rural residences and farms.
The County allows properly permitted electricity generating uses in RL areas and we therefore reasonably infer that the County has determined that such property use is compatible with other allowed RL uses subject to specific development and use standards. Furthermore, as stated in the foregoing discussion regarding the suitability of a Major Variance for the AMS project, the project will be consistent with the County General Plan and Development Code.

Given the existing SEGS VIII and IX facilities adjacent to the AMS site and future projected solar projects in the area, and the allowances for development of solar power in the RL zone, we find that the AMS project is compatible with surrounding RL uses.

No community facilities such as schools, stores, or recreational facilities are provided near the AMS site. Scattered rural residences and farms are within one mile of the proposed project site. However, given the existing and previously permitted uses in the AMS project area, such as the existing SEGS VIII and IX facilities, we find that the AMS plant will not be incompatible with surrounding sensitive receptors. (Exs. 1, p. 5.7-16; 302, p. 4.5-25(sic).)

6. Cumulative Impacts

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects [Cal. Code Regs., tit. 14, § 15065(a)(3).]

As shown by the evidence, the existing land uses similar to, and in the vicinity of, the proposed project site are the SEGS VIII and IX facilities. Otherwise, the surrounding area consists of undeveloped desert land and mountain terrain with small rural communities in the vicinity. The existing development in the project area, has contributed to the conversion of existing rural land uses including rural residences, open space, and agricultural activities.

Solar and wind applications for use of BLM and private land are proposed on approximately 553,000 acres of BLM land and 13,900 acres of non-federal land in the Western Mojave Planning Area. In addition, a 585 MW solar photovoltaic project is proposed for 5,033 acres of BLM land less than one mile northeast of the proposed project site, and a 10,105-acre wind energy project is proposed to be sited approximately seven miles south of the project site. Development of these projects would contribute to the conversion of existing agricultural, rural, and open space land uses. The conversion of these lands would represent a significant adverse cumulative land use impact, even without conversion of the lands resulting from the proposed project. (Exs. 302, pp. 5.5-24 – 5.5-26.)

With implementation of Condition of Certifications **LAND-1**, **LAND-2**, and **LAND-3,** the AMS project's contribution to the described cumulative impacts of existing and proposed projects will not be cumulatively considerable.

7. Public and Agency Comments

As discussed above, Staff received comments on the Staff Assessment from the State of California Department of Conservation**,** County of San Bernardino, Transition Habitat Conservancy, and the Applicant. Each commenter underscored the importance of appropriate mitigation for the conversion of Farmland and of adequately assessing factors such as water availability and water quality associated with farming that could occur at the proposed AMS site. (Ex. 302, pp. 4.5-27 – 4.5-31.) These comments collectively suggested that Staff revisit its initial analysis to give appropriate weight to these qualitative water issues.

The record shows that Staff took these comments into account and subsequently obtained additional information regarding the Adjudication and its impacts, existing regional ground water issues. Staff then re-ran the LESA Model again with reduced water availability scores and engaged in further analysis of the subjective qualitative issues not captured by the LESA Model. Staff's response to the comments and related actions are documented in the record. (Exs. 302, pp. 5.5-7 – 5.5-10, 5.5-27 – 5.5-31.) Staff ultimately concluded that the AMS project would have a significant impact to 128 acres of Important Farmland as designated by the FMMP, which requires mitigation at a one to one ratio.

FINDINGS OF FACT

Based on the uncontroverted evidence, the Commission makes the following findings:

1. The project will convert Prime Farmland and Farmland of Statewide Importance (Farmland) to non-agricultural use and thereby cause significant impacts to 128 acres of Important Farmland. However, implementation of Condition of Certification **LAND-1** will mitigate the impacts to a less than significant level.

2. The AMS project will not conflict with existing zoning for agricultural use or a Williamson Act contract. The AMS project is not subject to a Williamson Act contract.

3. The AMS project will not involve other changes in the existing environment, which would result in the conversion of Farmland to non-agricultural uses.

4. There is no evidence that the project will physically divide or disrupt an established community.

5. The AMS project is consistent with applicable land use LORS. To mitigate any potential LORS noncompliance regarding project closure and decommissioning and regarding the Subdivision Map Act, we require compliance with Condition of Certification **LAND-2** and **LAND-3**.

6. The AMS is compatible with surrounding land uses and will not result in any unmitigated public health or environmental impacts to sensitive receptors.

7. With implementation of Conditions of Certification **LAND-1, LAND-2**, and **LAND-3** the AMS project's contribution to cumulative impacts of existing and proposed projects will not be cumulatively considerable.

CONCLUSIONS OF LAW

1. With implementation of the mitigation measures specified in this Decision, and in the Conditions of Certification below, we conclude that construction and operation of the Abengoa Mojave Solar project will not result in significant adverse direct, indirect, and cumulative land use impacts.

2. The record contains an adequate analysis of the land use laws, ordinances, regulations, and standards that are relevant to the project and establishes that the project will not create any unmitigated, significantly adverse land use effects as defined under the California Environmental Quality Act.

3. The Conditions of Certification, below, ensures that Abengoa Mojave Solar Project will be designed, constructed, and operated in conformance with the applicable land use laws, ordinances, regulations, and standards identified in the evidentiary record and listed in the pertinent portion of **Appendix A** of this Decision.

CONDITIONS OF CERTIFICATION

LAND-1 The project owner shall mitigate for the loss of 128 acres of Important Farmland as designated by the California Department of Farmland Mapping and Monitoring Program, at a one-to-one ratio.

Verification: The project owner shall provide a mitigation fee payment to an agricultural land trust such as the Transition Habitat Conservancy or any other

land trust that has been previously approved by the Compliance Project Manager (CPM) prior to the start of construction. The fee payment will be determined by an independent appraisal conducted on available, comparable, farmland property on behalf of the agricultural land trust. The project owner shall pay all costs associated with the appraisal. The project owner shall provide documentation to the CPM that the fee has been paid and that the 128 acres of farmland and/or easements shall be purchased within three years of start of operation as compensation for the 128 acres of FMMP-designated Important Farmland to be converted by the AMS project. The documentation also shall guarantee that the land/easements purchased by the trust will be located in San Bernardino County and will be available in perpetuity for productive agricultural use. If no available land or easements can be purchased in San Bernardino County, then the purchase of lands/easements in other areas within western Mojave or adjacent counties, such as Kern County or Riverside County, is acceptable. The project owner shall provide to the CPM updates in the Annual Compliance Report on the status of farmland/easement purchase(s).

LAND-2 The project owner shall ensure that permanent closure of the project and its associated facilities comply with the County of San Bernardino's suggested Conditions of Approval (CSB 2010b) regarding project closure and decommissioning and San Bernardino County Development Code Chapter 84.29.060, Decommissioning Requirements.

Verification: Consistent with the requirements of **COMPLIANCE-11**, the project owner shall incorporate the applicable requirements of the San Bernardino County Development Code section 84.29.060, Decommissioning Requirements, into the AMS Facility Closure Plan, to the extent feasible, and in as much as the county requirements do not conflict with the California Energy Commission's requirements and standards related to the closure of power generating facilities. Consistent with the requirements of **COMPLIANCE-11,** the Project owner shall submit the Facility Closure Plan to the CPM at least 12 months prior to commencement of planned facility closure/decommissioning.

LAND-3 The project owner shall comply with the Subdivision Map Act (Pub. Resources Code Section 66410-66499.58) by adhering to the provisions of Chapter 87.04 of the San Bernardino County Code of Ordinances to ensure legality of parcels and site control.

Verification: At least 30 days prior to construction of the AMS project, the project owner shall submit evidence to the CPM, indicating approval of the merger of parcels by San Bernardino County, or written approval of another process (i.e., to adjust lot lines) that is acceptable to the county. The submittal to the CPM shall include evidence of compliance with all conditions and requirements associated with the approval of the Certificate of Merger and/or Notice of Lot Line Adjustment by the county. If all parcels or portions of parcels

are not owned by the project owner at the time of the merger, a separate deed shall be executed and recorded with the county recorder. A copy of the recorded deed shall be submitted to the CPM, as part of the compliance package.

B. TRAFFIC AND TRANSPORTATION

This section addresses the extent to which the project will affect the local area's transportation network. The record contains an analysis of: (1) the roads and routings that are proposed to be used for construction and operation; (2) potential traffic-related problems associated with the use of those routes; (3) the anticipated encroachment upon public rights-of-way during the construction of the proposed project and associated facilities; (4) the frequency of trips and probable routes associated with the delivery of hazardous materials; and (5) the possible effect of project operations on local airport flight traffic.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The proposed AMS site is 1,765 acres of privately-owned land in unincorporated San Bernardino County, approximately 17 miles northwest of the City of Barstow, and nine miles northwest of the community of Hinkley. The site lies at the intersection of Harper Lake Road and Lockhart Road, approximately five miles north of State Route 58 (along Harper Lake Road). Access is provided by Harper Lake Road which intersects State Route 58. Construction of AMS is expected to last for 26 months with start of commercial operations planned for winter 2013. The peak construction month, along with peak construction traffic levels, would occur at month 17.

The Applicant and Staff both submitted evidence in support of their respective analyses on project-related impacts to traffic and transportation. The evidence was undisputed. (6/28/10 RT 62-63, 65-73, 76-81, Exs. 1, § 5.13; Appendix H, 26, 46, 47, 48 [§ 11], 301, §5.10, 306.) This evidence establishes the existing Level of Service (LOS)[41] of roadways in the project area. The local roadways currently range from LOS A (best possible) during the afternoon peak traffic, to LOS C at the intersection of SR 58/Harper Lake Road. (Ex. 301, p. 5.10-10, Traffic and Transportation Table 2.)

[41] Level of Service (LOS) is a qualitative measure describing operational conditions within a traffic stream. The term is used to describe and quantify the congestion level on a particular roadway or intersection and generally describes these conditions in terms of such factors as speed, travel time, and delay. The *Highway Capacity Manual*[41] defines six levels of service for roadways or intersections ranging from LOS A representing the best operating conditions and LOS F, the worst.

The nearest airport facilities are:

1. Edwards Air Force Base at 12 miles south west of the AMS site;
2. Barstow-Daggett Airport at 32 miles southeast of AMS site; and
3. Southern California Logistics Airport at 27 miles south of the AMS site. (Ex. 301, p. 5.13-14.)

All of the airports are well outside the Federal Aviation Administration (FAA) 3.79-mile notification requirement zone for projects. Because of the AMS distance from the nearest airport, no impact on the regional airports would occur, and the project would not impact aviation safety.

AMS also lies within military restricted airspace of the R-2508 Complex, used by the Air Force Flight Test Center (Edwards Air Force Base), the National Training Center (Fort Irwin Military Reservation), and the Naval Air Weapons Station China Lake (NAWS China Lake). However, the Department of the Navy has concluded that this project would not result in any significant problems for the Navy and no mitigation is required. (Ex. 301, p. 5.10-14.)

The AMS project area is not serviced by public transit. In addition, bicycle activity in the vicinity of the AMS site is minimal-to-none. The County of San Bernardino Non-Motorized Transportation Plan Update (from June 2001) identifies planned bicycle facilities in the County; however, no bikeways are planned for the roadways adjacent to the AMS site. Furthermore, there are no pedestrian facilities, such as sidewalks and walkways, adjacent to the project site. A freight railroad line travels east-west approximately 4.5 miles south of the AMS site and is used on a daily basis. In the vicinity of the project site, Harper Lake Road, the access to the AMS site, crosses the railroad at-grade. AMS is not proposing to alter the at-grade crossing of the railroad line as part of the access to the site. (Ex. 301, p. 5.10-5.)

The evidence establishes that the Applicant and Staff analyzed scenarios for the current status of traffic flow, for the level of traffic during peak construction, and for the relatively minor amount of additional traffic during standard operations of the project.

1. Construction Impacts and Mitigation

Project construction is expected to take 26 months. The evidence includes analysis of potential construction traffic impacts for both construction workforce

traffic and construction truck traffic. Conditions were evaluated when the workforce would be at its highest. During the peak month (expected to occur at month 17 of the construction schedule) the average number of construction workers would be approximately 1,162 per day. The construction period project trip generation is displayed in **Traffic and Transportation Table 1** below.

Traffic and Transportation Table 1
Construction Period Project Trip Generation

Assumptions	***Project Trip Generation (trips per day)***
Person-Trips Generated by Workers (1,162 workers x 2)	2,324
20% Carpool @ 2.0 workers/vehicle	-232
Vehicle Trips Generated by Workers	2,092
– Trips to Park & Ride (42% of workers)	*(880)*
– Trips directly to the site	*(1,212)*
Bus Trips from Park&Ride[1, 2]	52
Truck Trips to Project Site[1]	134
Total Construction Period Vehicle Trips	**2,278**

[1] In the Level of Service calculations, bus and truck trips are converted to Passenger Car Equivalents (PCE's)
[2] The 1,162 workers x 42% @ park-and-ride = 488 to be transported by bus. Therefore, 13 bus trips (40 persons/bus) each way in the morning and evening, which equates to 52 bus trips.

Source: Ex. 301, p. 5.10-7.

Project-related intersection operations were evaluated during the morning (7:00-8:00 AM) and afternoon (4:00-5:00 PM) peak commute periods. Based on regional demographics and availability of skilled laborers, the Applicant expects that 86 percent of the construction employees would originate from areas west of the AMS site and the remaining 14 percent would originate from areas east of the AMS site. During construction, workers would commute from nearby residences (as opposed to being housed on-site). (Ex. 301, p. 5.10-8.)

The project proposes to provide a park-and-ride lot within the City of Barstow. The lot is located on the northern side of Main Street, approximately one mile east of SR 58. (Ex. 1, p. 5.13-16.) However, because most construction workers may approach the AMS site from the west, Condition of Certification **TRANS-1**,

provides Applicant the opportunity to demonstrate the feasibility of locating a park-and-ride lot to the west of the project.

The Applicant may need to temporarily close lanes or block traffic when delivering heavy equipment during construction. Consequently, the potential exists for a significant impact to occur in the form of temporary congestion, hazardous materials spill, or blockage of emergency access due to truck traffic during construction. Therefore, we have required the Applicant to develop a construction traffic control plan as indicated in the proposed Condition of Certification **TRANS-2**. Furthermore, the significant level of truck traffic during the construction period has the potential to cause damage to the pavement services on the roadways in the vicinity of the site, resulting in both a safety impact to motorists and economic impact to the local agencies who maintain the roads. Accordingly, Condition of Certification **TRANS-3** requires the Applicant to document and repair any project-related damage to local roadway surfaces.

The peak construction increase in traffic would represent a noticeable change when compared to existing conditions, particularly on Harper Lake Road between the AMS driveway and SR 58. Traffic would likely increase from existing daily traffic volume of 250 vehicles to 1,700 vehicles during the construction year. Nevertheless, the total 'with project' traffic volume would be relatively low and roadway segments would remain within the LOS thresholds already identified by the local jurisdictions. Because all nearby roadway segments and intersections are expected to operate at LOS D or better conditions, impacts from AMS-related construction traffic are less than significant. (Exs. 1, pp. 5.13.-16 - 5.13-22, 301, p. 5.10-9.)

The LOS of the study intersections for existing conditions and for the construction year, with and without the AMS project is summarized below in **Traffic and Transportation Table 2**.

Traffic and Transportation Table 2
Peak Construction (Year 2012) Intersection Performance

Study Intersection	Existing				Year 2012				Year 2012 With Project			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
SR 58/Harper Lake Road	12.4	B	16.1	C	13.0	B	17.1	C	33.3	D	31.3	D
SR 58/ Lenwood Road	3.2	A	3.1	A	4.0	A	4.3	A	4.1	A	4.6	A
Main Street/SR 58 SB Ramps	5.1	A	4.5	A	4.8	A	4.3	A	10.1	B	5.4	A
Main Street/SR 58 NB Ramps	11.3	B	11.9	B	10.9	B	11.5	B	10.9	B	11.5	B

Notes: All study intersections are unsignalized.
Source: Ex. 1; 301, p. 5.10-10.

The intersection of SR 58/Harper Lake Road is expected to operate at acceptable LOS D conditions, during the AM and PM peak hour. While the service level meets Caltrans' standards, the expected queue of vehicles making the left-turn from SR-58 to Harper Lake Road could significantly exceed the presently available storage area during the peak construction period. The Applicant and Staff agree that implementation of Condition of Certification **TRANS-4**, which requires the project owner to stagger work starting times for day-shift employees and restricts deliveries during specified times, will mitigate potential this impact to a less than significant level. Thus, the evidence of project impacts to traffic on roadway segments and at traffic ramps reveals that the AMS project construction will not impose any significant impacts to traffic flow. (Ex. 301, 5.10-11, Tables 5 and 6.)

2. Operation Impacts and Mitigation

To analyze the project's traffic impacts during standard operations, a 20-year horizon from the time the project begins operating was evaluated. (Exs. 1, pp. 13-23 – 13-26, 301, pp. 5.10-11 – 5.10-13.) The background traffic volumes for the target year 2035 were estimated by applying a 2 percent annual growth rate to the "through" traffic along SR-58 and Main Street.

During normal operations, the AMS project would require a labor force of 68 full-time employees. Therefore, the project would generate 250 vehicles per day with 52 vehicles in the peak hour. During standard operation approximately 38 truck trips per month would occur primarily during off-peak travel times.

Workers for the operational phase of the project are assumed to come from the local area; therefore, the routes taken to the AMS site would likely be I-15, SR-58, and Harper Lake Road. Standard operation of the project would not significantly affect the LOS of the local roadways or intersections, which would operate at LOS D or better conditions with the AMS-related traffic. (Ex. 301, p. 5.10-13, Table 8.) Therefore, impacts from AMS-related traffic will be less than significant.

The evidence also contains an analysis of access to the project site for emergency vehicles during project operation. Emergency vehicles can access the site directly from SR-58 from either the east or the west and would not be barred from access due to a singular problem on a surrounding roadway. Based on this evidence, we conclude that the regional access to the site is adequate for emergency vehicles. (Ex. 301, p. 5.10-13.)

The AMS site is located near a trunk line of the Burlington Northern Santa Fe (BNSF) that parallels SR-58 and connects to the main yard in Barstow. As noted above, Condition of Certification **TRANS-5** will provide enhanced traffic control during construction for the at-grade railroad crossing near the site. Additional traffic during project operation will not significantly affect the railroad crossing. (Ex. 301, 5.10-14.) In addition, the AMS site is located greater than 20 miles from the nearest airport. The evidence of record establishes that reflection of the sun off the project's parabolic mirrors would not be a significant issue to the pilots of passing aircraft given that the parabolic mirrors are designed to reduce glare and would therefore not cause a hazard to air navigation. (*Id*.)

Hazardous materials, including small quantities of diesel, water treatment chemicals, and oil will be delivered during project operations. The main hazardous material used on-site would be heat transfer fluid for the solar arrays. These materials will be delivered to the site via truck from the Barstow rail yard. Condition of Certification **TRANS-5** includes a condition that precludes delivery of hazardous materials during non-daylight hours, in order to enhance the safety at the rail crossing near the site. In addition to the governing federal regulations, Condition of Certification **HAZ-3** requires the Applicant to develop and implement

a Safety Management Plan for the delivery of hazardous materials. (See the **Hazardous Materials Management** section of this document.)

3. Agency and Public Comments

Joe Ramirez, a member of the public, commented on or made inquiries regarding the Staff Assessment. He asked about requiring contractors driving to the site to slow down and minimize passing on Harper Lake Road; expressed concern about roadway damage such as pot holes; which could occur from heavy traffic; and, asked whether park and ride lots would also apply to contractors.

Staff responded that the Energy Commission does not have jurisdiction over state motor vehicle law regarding speeding and safe passing but Staff nonetheless encourages the Applicant to impose safe driving requirements in its contract with employees and vendors. Regarding possible roadway damage, Staff advised that Condition of Certification **TRANS-3** requires the Applicant to repair Harper Lake Road and a portion of SR-58 to pre-project condition. With regard the park and ride lots, Staff responded that the lots would be for a majority of the construction workers as specified in Condition of Certification **TRANS-1.** Staff further clarified that some deliveries will be made directly the site, while others would be made to a nearby staging/assembly area. (Ex. 301, p. 5.10-20.0

4. Cumulative Impacts

Cumulative impacts

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. [Cal. Code Regs., tit. 14, § 15065(a)(3).]

The evidence includes an analysis of traffic conditions during construction of the AMS project (Year 2012) in the context of other known development projects in the area[42]. The other proposed solar-generating facilities in the Western Mojave

[42] Wal-Mart Food Distribution Center (Barstow) – Lenwood Road, between Mains Street and SR-58. Nursery Product LLC Composting Facility (San Bernardino County) – 160 acre bio-solid and composting facility at Helendale Road and SR-58.Cambridge Homes (Barstow) – 426 single family homes and 43 acres of light industrial uses on Lenwood Road. (Ex. 301 p. 5.10-16.)

region are widely-spread and as a result, traffic generation is dispersed. More importantly, these facilities generate a negligible amount of traffic during standard operations. Therefore, the cumulative impact of these projects together with AMS project is less than significant. (Exs. 1, pp. 5.13-17 – 5.13-26, 301, p. 5.10-16.)

FINDINGS OF FACT

Based on the undisputed evidence in the record and assuming implementation of the Conditions of Certification which follow, we make the following finds and conclusions.

1. The AMS project would be consistent with the Circulation and Infrastructure Element of the County of San Bernardino General Plan.

2. The AMS project will comply with all applicable LORS related to traffic and transportation.

3. The AMS project will not significantly degrade the level of service on local roadways.

4. During the construction and operation phases, local roadway and highway demand resulting from the daily movement of workers and materials will not increase beyond significance thresholds established by San Bernardino County.

5. None of the study segment's LOS would deteriorate to a significantly low LOS due to project construction, so the project will not result in a significant impact.

6. During the construction and operational phase, the AMS will not adversely affect local roads or aviation operations associated with any airport flight traffic.

7. Construction and operation of the AMS project will have no significant impact on the military restricted airspace of the R-2508 Complex, used by the Air Force Flight Test Center (Edwards Air Force Base), the National Training Center (Fort Irwin Military Reservation), and the Naval Air Weapons Station China Lake (NAWS China Lake).

8. The AMS project will have no significant impacts on public transportation, bicycle, or pedestrian facilities.

9. With implementation of the Conditions of Certification the AMS project will not result in significant impacts.

10. Since there are no significant direct or cumulative traffic and transportation impacts, there will be no environmental justice issues.

CONCLUSIONS OF LAW

1. The AMS project would be consistent with the Circulation Element in the local circulation plans and policies and all other applicable laws, ordinances, regulations, and standards.

2. The AMS project will not have a significant adverse impact on the local and regional road/highway network.

3. The AMS project presents no environmental justice issues related to traffic and transportation.

CONDITIONS OF CERTIFICATION

TRANS-1 Prior to site mobilization activities, the project owner shall secure or construct one or more park-and-ride facilities with a combined capacity of 500 spaces.

Verification: At least 90 days prior to start of site mobilization, the project owner shall propose 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. The proposal shall include a rationale for the location of the lot(s) based upon the expected geographic distribution of employees and availability of suitable sites. 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(s) are 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 project owner 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 feet 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 project owner shall submit a letter to San Bernardino County, Caltrans, and the CPM indicating such repairs are finished and ready for inspection.

TRANS-4 During construction, the project owner will stagger the start time of employees for the day-time shift (morning start) in four roughly equal groups spaced by at least 30 minutes between groups. Also during construction, the project owner will be restricted from receiving any construction deliveries from the west starting 30 minutes before the day-time shift and continuing until all groups have arrived for the morning shift.

Verification: The project owner shall include these restrictions in the construction traffic control plan required by **TRANS-2**.

TRANS-5 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: A record of hazardous materials deliveries shall be provided to the CPM as required in **HAZ-3**.

C. SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

This topic reviews the demographic characteristics of population centers near the project site to evaluate the potential impacts of project-induced population increases and the fiscal and physical capacities of local communities to accommodate population increases. The project's economic benefits, including local project-related expenditures, property and sales tax revenues, as well as school impact fees, are also discussed. Additionally, an environmental justice screening analysis is included to determine whether the project will result in disproportionate impacts on minority and/or low-income populations and, if so, whether mitigation is required.

The evidence for this topic was undisputed. (6/28/10 RT 64-76, 81, Exs. 1, § 5.11; 48 [§9], 300, § 5.8.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

Under CEQA Guidelines, a project may have a significant effect on socioeconomics if it would:

- Induce substantial population growth in an area, either directly or indirectly;
- Displace substantial numbers of people and/or existing housing, necessitating the construction of replacement housing elsewhere;
- Cause a substantial change in revenue for local businesses or government agencies; or
- Adversely impact acceptable levels of service for law enforcement, schools, and hospitals.

Additionally, the project was analyzed to determine if it would:

- Result in any disproportionate adverse socioeconomic impacts to any low-income or minority population.

The 1,765-acre AMS site is located approximately nine miles west of the outermost edge of the community of Hinkley in unincorporated San Bernardino County.

1. Potential Impacts

Socioeconomic impacts are considered significant if a large influx of non-resident workers and dependents move to the project area, increasing demand for community resources that are not readily available. (Exs. 1, § 5.11, 300, p. 5.8-5.)

Over the approximate 26-month construction period, an average of approximately 830 daily construction workers will be required, with a peak daily workforce of 1,162, in month 17 of construction. Laborers will include craftspeople, supervisory, support, and construction management personnel. Once operational, the project will employee 68 workers. (Exs. 1, p. 5.11-30; 1, § 5.11-2.3; Tables 5.11-8, 5.11-9, 5.11-10, 5.11-11; 300, p. 5.8-6.) The record indicates that a large local workforce in San Bernardino, Riverside, Ontario and Los Angeles Counties is sufficiently skilled and diverse to meet project construction needs. (Exs. 1, Tables 5.11-16; 300, p. 5.8-7, Socioeconomics Tables 4 and 5.)

For the purpose of this analysis, a project will induce substantial population growth when workers permanently moving into the project area because of project construction and operation, thereby encouraging construction of new homes, extension of roads or other infrastructure, and/or require the needs for new or expanded public services. To determine whether the AMS project would induce population growth, Staff's analysis assessed the availability of the local workforce within the regional study area. "Local workforce" for the AMS project is considered to be the Riverside/San Bernardino/Ontario and Los Angeles County Metropolitan Statistical Areas (MSA).[43]

As noted above, the Applicant expects that a peak daily workforce of 1,162 during month 17 of construction. (Ex. 1, p. 5.11-23.) This peak employment number is used to analyze worst-case construction population and employment impacts. Socioeconomics **Table 1** below shows Year 2006-2016 occupational employment projections for the Riverside/San Bernardino/Ontario and Los Angeles County MSA's by construction labor skill as compared to the estimated number of total construction workers by craft needed during the peak month as presented in the AFC. (Ex. 1, p. 5.11-24.) Data contained in the evidence indicates there is more than adequate local workforce for peak month project

[43] Metropolitan Statistical Areas are geographic entities defined by the U.S. Office of Management and Budget (OMB) for use by Federal and State statistical agencies in collecting, tabulating, and publishing socioeconomic statistics.

construction. As such, construction of the proposed project would not induce substantial growth or concentration of population in the project area and construction of the AMS project would not encourage people to permanently relocate to the area. Should some construction workers from within the study area choose to stay temporarily at a local area motel or hotel close to the AMS site, there is ample transient housing available. There are approximately 1,400 hotel/motel rooms and suites among 19 different establishments in the Lancaster/Palmdale area. (Ex. 1, p. 5.11-27.) We therefore conclude that construction of the AMS project would have no direct or indirect impact on population growth in the area.

Since project-induced population increases will be minimal, construction and operation of the project will not result in significant adverse impacts on government services including: schools, parks and recreation, public utilities, law enforcement, or emergency services in the local communities. (Exs. 1, § 5.10.4.3.2 et seq., § 5.10.4.4.7 et seq.; 300, pp. 5.8-9 - 5.8-10.)

The AMS site is located within the boundaries of the Barstow Unified School District. The evidence demonstrates that there is a more than adequate local workforce available for proposed project construction and operational workforce needs. Therefore, the AMS project would have no direct or indirect impact on population growth in the area and would not impact existing or future service levels of the Barstow Unified School District.

Education Code section 17620 authorizes a school district to levy a fee against any construction within a district. However, in January of 2008, the Barstow Unified School District suspended the collection of development impact fees for industrial and residential development. (Ex. 1, p. 5.11-31.) Thus, the proposed AMS project would not be required to pay a development impact fee to the Barstow Unified School District. As no school impact fee is imposed by the applicable school districts, the AMS project would be in compliance with Education Code section 17620. (Ex. 300, p. 5.8-10.)

Socioeconomics Table 1
Total Labor by Skill in Riverside/San Bernardino/Ontario and Los Angeles County MSA's (2006 and 2016 Estimate) and AMS Required Construction by Craft – Peak Month

Trade	Total # of Workers for Project Construction – Peak Month	Riverside/San Bernardino/Ontario MSA 2006	Los Angeles County MSA 2006	Riverside/San Bernardino/Ontario MSA 2016	Los Angeles County MSA 2016
Carpenters, Masons, Finishers	75	32,960	35,480	37,080	39,340
Electricians	125	6,740	13,040	7,600	13,700
Equipment Operators	35	4,790	4,410	5,460	4,780
Grading Supervisors	0	10,990[1]	15,490[1]	12,380[1]	16,440[1]
Heavy Equipment Operator	3	4,790	4,410	5,460	4,780
Insulators, Sheetmetal Workers	52	27,930[2]	31,330[2]	32,080[2]	34,810[2]
Ironworkers	45	19,460	54,990	20,800	52,230
Construction Laborers	65	27,930	31,330	32,080	34,810
Mechanic	0	22,580	43,270	26,110	47,420
Mechanics Helper	0	22,580	43,270	26,110	47,420
Millwrights	55	2,630	10,400	2,960	10,380
Painters	0	7,950	13,240	9,210	14,250
Pipefitters	145	4,630	12,090	5,330	12,900
Security	12	10,000	52,150	11,550	61,130
Sprinklerfitters	24	4,630[3]	12,090[3]	5,330[3]	12,900[3]
Supervisors, Planners	85	10,990[1]	15,490[1]	12,380[1]	16,440[1]
Surveyors, Designers	30	1,420	6,470	1,670	7,030
Welders	90	3,960	8,410	4,640	8,840
Assembly Workers (Semi Skilled)	298	10,990[1]	15,490[1]	12,380[1]	16,440[1]

[1] The "Supervisors, Construction and Extraction Workers" EDD category was used; [2] The "Construction Laborers" EDD category was used; [3] The "Plumbers, Pipefitters, and Steamfitters" EDD category was used.
Source: Ex. 1, Table 5.11-16

2. Section 25523(h) Public Benefit Findings

Public Resources Code section 25523(h) requires discussion of the project's public benefits. The project's fiscal benefits, based on property value, payroll, local purchases of equipment, supplies, and associated expenses, include the following estimates:

Socioeconomics Table 2
AMS Economic Benefits (2009 dollars)

Fiscal Benefits	
Construction materials and capital expenditures – Local	$121 million
Annual Operations and Maintenance – Labor	$8.2 million
Annual Operations and Maintenance – Materials	$12.7 million
State and local sales taxes: Construction	$4.9 million
State and local sales taxes: Operation	$90,000
Estimated annual property taxes	$300,000
School Impact Fee	$0
Direct, Indirect, and Induced Benefits	
Estimated Direct Employment	
Construction Employment	830 jobs (maximum)
Construction Payroll	$272 million
Operational Employment	68 jobs (maximum)
Operational Payroll	$12.6 million
Estimated Indirect and Induced Effects	
Construction Jobs	1,711 jobs
Indirect Construction Labor Income	$39.2 million
Induced Construction Labor Income	$107.7 million
Operational Jobs	92 jobs
Indirect Operational Labor Income	$3.5 million
Induced Operational Labor Income	$2.8 million

Source: Exs. 1; 300 p. 5.8-13.)

3. Environmental Justice Screening Analysis

California law defines environmental justice as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies." [Govt. Code § 65040.12(e); Pub. Res. Code, § 71116(j).]

Federal Executive Order 12898 (1994), "*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*," requires state and federal agencies to incorporate environmental justice concerns in their environmental analyses. The USEPA's *Draft Revised Guidance for Investigating Title VI Administrative Complaints Challenging Permits* (USEPA, Aug. 2000) calls for a two-step analysis: (1) does the potentially affected community include minority and/or low-income populations and, if it does, (2) are the environmental impacts likely to fall disproportionately on minority and/or low-income members of the community. (Ex. 1, § 5.11.3.) See also, *Title VI Public Involvement Guidance for EPA Assistance Recipients Administering Environmental Permitting Programs*, 71 Fed. Reg. 14207 et seq. (USEPA, Mar. 21, 2006).

According to the USEPA's *Guidance*, an environmental justice population exists if the minority and/or low-income populations of the affected area constitute 50 percent or more of the general population or if the minority population percentage in the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. (*Id*; Ex. 300, p. 5.8-2.)

Applicant used a six-mile radius of the project site to determine the presence of environmental justice populations. The same six-mile radius was used to assess air quality and public health effects. Census 2000 data indicate that, for the AMS project, the total population within a six-mile radius of the proposed site is 181 persons, and the total minority population is 89 persons or 49.17 percent of the total population. However, while the demographic screening area as a whole does not exceed 50.0 percent, several Census Blocks within the six-mile radius of the proposed site contain a minority population greater than 50 percent. Therefore, we have considered environmental justice in our environmental impact analyses. (Ex. 300, p. 5.8-2.)

The evidence also identified the current population living below the poverty level, based on Year 2000 U.S. Census. The total population within a six-mile radius of

the proposed site evaluated for low-income populations is 5,837 persons, and the total low-income population is 596 persons or 10.21 percent of the total population.[44]

According to Applicant, since the mitigated project will not result in high and adverse impacts to any population, the project will not result in any disproportionate impacts to environmental justice populations.[45] Staff's analysis reflects the same conclusion. (Exs. 1, p. 5.11-34; 300, p. 5.8-14.)

4. Cumulative Impacts

Cumulative socioeconomics impacts may occur when overlapping construction schedules for several projects in the same vicinity create a demand for workers that cannot be met by the local labor force, resulting in an influx of non-local workers and their dependents. (Ex. 300, pp. 5.8-11.)

There are prospective plans for substantial solar and wind energy development in the project area and throughout the Southern California desert region. However, despite the potential for construction schedule overlaps, there is no evidence that the project's demand for workers will result in adverse cumulative socioeconomic effects because a large, skilled workforce in the study area is available within commuting distance. Since the AMS project will not result in any project-specific adverse socioeconomic impacts, it will not cumulatively contribute or combine with any potential impacts related to the future solar and wind development projects in the region. Further, the economic benefits derived from construction and operation of AMS will provide cumulative benefits when project-induced revenues are combined with the revenues from future development projects. We therefore conclude that AMS will not contribute to adverse

---

[44] The smallest geographic unit available within the Year 2000 US Census data for income status is the Block Group, while racial profile data is available in the smaller Block unit. Therefore, the total population presented for the low income demographic profile is larger than the minority demographic profile due to the Block Group extending beyond the six-mile radius of the AMS site.

[45] The evidentiary record indicates that the fully mitigated project will not result in any significant adverse environmental or public health impacts to any population, regarding the following technical topics: **Air Quality, Hazardous Materials Management, Land Use, Noise, Public Health, Socioeconomics, Soils and Water Resources, Traffic and Transportation, Transmission Line Safety and Nuisance, Visual Resources, and Waste Management**. The analyses for each topic were based on well-established scientific protocols and regulatory standards, which account for sensitive receptors that are presumed to be most susceptible to adverse environmental or public health impacts.

cumulative impacts to the area's population, employment, housing, police, schools, parks, or hospitals. (Ex. 300, pp. 5.8-12 to 5.8-13.)

FINDINGS OF FACT

Based on the uncontroverted evidence of record, we make the following findings:

1. A large, skilled labor pool in San Bernardino County, California, and in neighboring Los Angeles County is available for construction and operation of the project.

2. Over the 26-month construction period, an average of approximately 830 daily construction workers, with a peak daily workforce of 1,162, will be required during month 17 of construction.

3. The project will hire about 68 permanent, full-time employees from the local area for project operations.

4. The project will not cause an influx of a significant number of construction or operation workers to permanently relocate to the local area because most of the workers hired through the Project Labor Agreement would reside within commuting distance of the site.

5. There is an adequate supply of hotels/motels and rental properties within the project vicinity to accommodate workers who stay in the area temporarily during the week and commute to their homes on the weekend.

6. The project will not result in significant adverse effects on local employment, housing, schools, public utilities, parks and recreation, law enforcement, or emergency services.

7. In January of 2008, the Barstow Unified School District suspended the collection of development impact fees for industrial and residential development. Thus, the proposed AMS project would not be required to pay a development impact fee to the Barstow Unified School District in order to be in compliance with Education Code section 17620.

8. The total capital expenditures and construction material costs of the AMS are estimated (in 2009 dollars) at $121 million.

9. Construction payrolls are estimated (in 2009 dollars) at $272 million.

10. The anticipated construction payrolls, the local purchases of materials and supplies, and the sales tax revenues generated by the expenditures will

have a temporary beneficial impact on the economies of San Bernardino County.

11. When completed, the project will provide an annual operations payroll of approximately $12.6 million (2009 dollars).

12. The project will generate property tax revenues of approximately $300,000 (2009 dollars) per year for San Bernardino County.

13. The project will provide direct, indirect, and induced economic benefits to San Bernardino County and surrounding communities.

14. The minority and low-income population densities, respectively, within a six-mile radius of the project site do not exceed the 50 percent threshold for a screening level environmental justice analysis.

15. However, several Census Blocks within the six-mile radius of the proposed site contain a minority population greater than 50 percent. Therefore, we have considered environmental justice in our environmental impact analyses.

16. The project will not create disproportionate impacts on minority and/or low-income populations because the mitigated project does not result in any significant health or environmental impacts to any population in the project vicinity.

17. Construction and operation of the project will not result in any direct, indirect, or cumulative significant adverse socioeconomic impacts.

CONCLUSIONS OF LAW

1. We therefore conclude that implementation of all Conditions of Certification in this Decision, will ensure that the project will comply with all applicable laws, ordinances, regulations, and standards relating to socioeconomic factors as identified in the pertinent portions of **Appendix A**.

2. The evidence of record contains an adequate analysis of socioeconomic effects related to the project and establishes that the project will not create any significant adverse socioeconomic effects as defined under the National Environmental Policy Act or the California Environmental Quality Act.

3. The evidence of record contains an adequate analysis of potential socioeconomic effects in accordance with federal and state guidelines on

environmental justice and establishes that the project will not create any disproportionate adverse effects on minority or low-income populations.

4. Because no significant adverse socioeconomics impacts would occur as a result of construction and operation of the proposed AMS project, no conditions of certification are required for socioeconomic resources.

D. NOISE AND VIBRATION

The construction and operation of any power plant project will create noise or unwanted sound. The character and loudness of this noise, the times of day or night during which it is produced, and the proximity of the project to sensitive receptors combine to determine whether project noise will cause significant adverse impacts. In some cases, vibration may be produced as a result of construction activities such as blasting or pile driving; these activities have the potential to cause structural damage and annoyance. The analysis of record summarized below evaluates whether noise and vibration produced during project construction and operation will be sufficiently mitigated to comply with applicable law and avoid the creation of significant adverse impacts. The evidence was undisputed. (6/28/10 RT 64-76, 81; Exs. 1, §5.8, Appendix G, 3, 26 [VI], 48 [§7.0], 301, §5.6, 306.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Noise-Sensitive Receptors and Setting

The proposed Abengoa Mojave Solar (AMS) project site is located in a sparsely populated unincorporated area in San Bernardino County, California, approximately nine miles northwest of the community of Hinkley. The closest and only noise-sensitive noise receptors within several miles are six to eight residential homes at four widely-separated locations between approximately 2,400 feet and 4,500 feet south of the planned location of the nearest power block. (Exs.1, § p. 5.8-12, 301, pp. 5.6-3 to 5.6-4.)

As the area around the project site is relatively remote, there are few daytime noise sources. These may include very sporadic traffic noise from vehicles on the only nearby paved road, Harper Lake Road (typically less than one or two vehicles per hour during the daytime); high-altitude over-flights of aircraft; and natural sounds from birds and insects. The predominant noise source during the daytime, however, is the interaction of the wind with surrounding vegetation and man-made structures (such as the existing transmission line towers near the MSP site). No agricultural activities were identified. No noise was observed from vehicle traffic on State Route 58, nearly six miles away. The nighttime noise environment once the wind dies down was observed to be quiet. (Ex. 1, pp. 5.8-12 - 5.8-13, 301, p. 5.6-4.)

The Applicant performed an ambient noise survey from May 19 through May 20, 2009, using acceptable equipment and techniques. (Exs. 1, p. 5.8 -13 – 5.8-5.8-17.) Long-term (25+ consecutive hour) noise measurements were recorded at two locations (LT-1 and LT-2). Short-term (15-minute) measurements were taken at various times throughout the day and night at three other locations (ST-1, ST-2 and ST-3). Because there are no noise receptors near location ST-3 (the abandoned Boys' Oasis facility at the junction of Harper Lake Road and Santa Fe Road), project noise impacts at ST-3 were not evaluated. (Ex. 301, pp. 5.6-5 - 5.6-6.)

The ambient noise monitoring surveys recorded L_{eq} (energy average) and L_{90} (background) noise levels. **Noise Table 1** below, describes the monitoring locations and measurement times, and summarizes the ambient noise measurements at these locations in A-weighted decibels (dBA). (Ex. 301, p. 5.6-6.)

Noise Table 1
Summary of Measured Noise Levels

Measurement Sites		Measurement Dates/Times	Measured Noise Levels, dBA	
Site	**Location**		**Average During Daytime Hours L_{eq}**	**Nighttime Hours L_{90}**
LT-1	Near the Ramirez residence at 15563 Edie Road	Continuously from 1:23 PM May 19, 2010 through 3 PM, May 20, 2010	49	21
LT-2	Near the Grieder residence at 41234 Harper Lake Road	Continuously from 1:37 PM May 19, 2010 through 3:00 PM, May 20, 2010	42	27
ST-1	Near the Holmes residence at 15635 Lockhart Road	15-minute measurements several times throughout the May 19-20, 2010 survey period (morning, afternoon, evening and night)	47	21
ST-2	Near the Lucy residence at 15654 Roy Road (represents 3 to 4 homes in a cluster)	15-minute measurements several times throughout the May 19-20, 2010 survey period (morning, afternoon, evening and night)	46	21

Source: (Ex. 301, p. 5.6-6 and Ex. 1, p. 5.8-20.)

2. Construction

Construction noise is usually a temporary phenomenon and in this case, is expected to occur over a period of about 26 months. Construction of the AMS project is expected to be typical of similar projects in terms of schedule, equipment used, and other types of activities. (Exs. 1, p. 5.8-27 – 5.8-30, 301, p. 5.6-7.) No off-site linear facilities will be constructed as part of the project.

Predicted project construction noise levels, including construction of on-site linear facilities, are summarized below in **Noise Table 2**.

NOISE Table 2
Predicted Construction Noise Levels

Receptor	Highest Construction Noise Level (dBA)	Measured Existing Ambient, Average Daytime L_{eq} (dBA)	Project Plus Ambient	Change
LT-1	60	49	60	+11
LT-2	54	42	54	+12
ST-1	60	47	60	+13
ST-2	56	46	56	+10

Source: (Ex. 301, p. 5.6-7.)

3. Compliance with Laws, Ordinances, Regulations and Standards

Because the project site is located within San Bernardino County (County), the primary laws, ordinances, regulations and standards (LORS) applicable to the project are the County noise requirements. The County allows construction between the hours of 7:00 a.m. and 7:00 p.m., Mondays through Saturdays, to be exempt from County noise level requirements. (Ex. 301, p. 5.6-3.) Condition of Certification **NOISE-6** will ensure that these hours are enforced. Therefore, the noise impacts of the AMS project construction activities will comply with local noise LORS. (Ex. 301, p. 5.6-7.)

The County's Development Code governs allowable vibration levels and the Federal Transit Administration (FTA) also recommends ground-borne vibration standards. (Exs. 1, p. 5.8-11, 301, pp. 5.6-2 - 5.6-3.) The only construction operation likely to produce vibration that could be perceived off site is pile driving. The Applicant does not anticipate pile driving during project construction. (Exs. 1,

5.8-29, 301, p. 5.6-9.) Therefore, the AMS project construction activities will comply with the LORS for vibration.

Federal and State laws regulate worker noise exposure under the Occupational Safety & Health Act (OSHA; 29 U.S.C. § 651 et seq.) and the California Occupational Safety & Health Act (Cal-OSHA; 29 U.S.C. § 651 et seq., Cal. Code Regs., tit. 8, §§ 5095-5099). (Ex. 301, p. 5.6-2.) Condition of Certification **NOISE-3** will ensure that construction workers are adequately protected from noise hazards. (Ex. 301, p. 5.6-9.)

We therefore find that the project will comply with the LORS for construction worker noise exposure.

4. CEQA Impacts

Although the County does not limit construction noise levels, the projected noise levels were compared with ambient levels for purposes of analyzing impacts under CEQA. (Ex. 301, p. 5.6-7.)

CEQA requires that significant environmental impacts be identified and either eliminated or mitigated to the extent feasible. In general, an increase over background noise levels up to and including 5 dBA in a residential setting is considered insignificant; an increase of more than 10 dBA, however, is typically considered significant. An increase of between 5 and 10 dBA should be considered adverse, but could be either significant or insignificant, depending upon factors such as: (1) the resulting noise level; (2) the duration and frequency of the noise; (3) the number of people affected; and (4) the land use designation of the affected receptor sites.

Noise due to construction activities is usually considered insignificant in terms of CEQA compliance if the construction activity is temporary, the use of heavy equipment and noisy activities is limited to daytime hours, and industry-standard abatement measures are employed. (Exs. 1, p. 5.8-23, 301, pp. 5.6-4 - 5.6-5.)

a. General Construction Noise

Noise Table 2 above indicates that general construction noise (including noise associated with construction of on-site linear facilities) will increase the existing ambient noise level at the project's identified noise-sensitive receptors by 10 to 13 dBA. Such an increase will be considerable. These construction noise

predictions are conservative, however. For instance, general construction activities with the most equipment items in use and most intense activities were used in these calculations; during periods of reduced activity, lower noise levels would be expected. However, in consideration of the project's considerable noise effects, and in addition to Condition of Certification **NOISE-6**, Conditions of Certification **NOISE-1** and **NOISE-2** will establish a public notification and noise complaint process to resolve any complaints regarding construction noise. (Ex. 301, pp. 5.6-7 - 5.6-8.)

b. Steam Blows

Although **Noise Table 2** presents the project's predicted general construction noise levels, the loudest noise typically encountered during construction of any project incorporating a steam turbine is usually created by steam blows, a process required to flush out the steam system at the end of the construction period, before operations can begin. A series of short steam blows, lasting two or three minutes each, are performed several times daily over a period of two or three weeks. High pressure steam blows, if unsilenced, can typically produce noise levels as high as 129 dBA at a distance of 50 feet; this would amount to roughly 96 dBA at LT-1. Unsilenced steam blows could be disturbing at the nearest noise-sensitive receptors, depending on the frequency, duration, and noise intensity of venting. With a silencer installed on the steam blow piping, noise levels are commonly attenuated to 89 dBA at 50 feet. A quieter steam blow process utilizing lower pressure steam over a continuous period of about 36 hours may also be used. Resulting noise levels reach about 86 dBA at 50 feet. Condition of Certification **NOISE-7** will ensure that appropriate restrictions on steam blows are enforced. Therefore, noise impacts related to steam blows will be less than significant. (Ex. 301, p. 5.6-8.)

The evidence establishes that construction noise impacts to sensitive receptors will be intermittent and temporary and take place during daytime hours. The evidence further shows that with implementation of the Conditions of Certification, these noise effects of the AMS project construction activities will be less than significant. (Ex. 301, pp. 5.6-8 – 5.6-9.)

5. Operation

The primary noise source of the project will be the power block, where the steam turbine generator, cooling tower, electric transformer, and various pumps and fans will be located. (Ex. 301, p. 5.6-9.)

Under the County's development standards, the project's operational noise level at residential receptors is limited to 55 dBA L_{eq} during the daytime (between 7:00 a.m. and 10:00 p.m.), and to 45 dBA L_{eq} during the nighttime (between 10:00 p.m. and 7:00 a.m.). Based on the Applicant's noise modeling to determine the project's noise impacts on sensitive receptors, predicted daytime operational noise levels are summarized in **Noise Table 3** below. (Ex. 301, p. 5.6-9.)

Noise Table 3
Predicted Daytime Operational Noise Levels at All Identified Sensitive Residential Receptors

Receptor	Project Daytime Noise Level (dBA)	Measured Existing Ambient, Average Daytime L_{eq} (dBA)	Project Plus Ambient Noise Level (dBA)	Change
LT-1	53	49	54	+5
LT-2	40	42	44	+2
ST-1	52	47	53	+6
St-2	46	46	49	+3

Source: (Ex. 301, p. 5.6-10.)

As shown, operational noise levels at the project's noise-sensitive receptors are predicted to range from 40 dBA to 53 dBA; these levels are less than the 55 dBA daytime LORS limit for residential uses in San Bernardino County. (Ex. 301, p. 5.6-9.)

Predicted nighttime noise levels at the project's noise-sensitive receptors are presented in **Noise Table 4** below.

Noise Table 4
Predicted Operational Nighttime Project Noise Levels at All Identified Sensitive Residential Receptors

Receptor/ Distance	Project Nighttime Noise Level (dBA)	Measured Existing Ambient, Average Nighttime L_{90} (dBA)	Project Plus Ambient Noise Level (dBA)	Change
LT-1	22	21	25	+4
LT-2	7	27	27	0
ST-1	21	21	24	+3
ST-2	15	21	22	+1

Sources: (Ex. 301, p. 5.6-11)

As shown, predicted nighttime noise levels range between 7 dBA and 22 dBA. These levels are less than the 45 dBA nighttime LORS limit. (Ex. 301, p. 5.6-10.)

Condition of Certification **NOISE-4** will impose mitigation measures to bring project operational noise levels into compliance with LORS limits, if necessary. Also to ensure compliance, Conditions of Certification **NOISE-1** and **NOISE-2** will establish a public notification and noise compliance process requiring the Applicant to resolve any complaints caused by operational daytime or nighttime noise. (Ex. 301, p. 5.6-10.)

With implementation of these conditions of certification, noise due to the operation of the AMS project will be in compliance with the applicable LORS. (Ex. 301, p. 5.6-10.)

Although the project will comply with applicable LORS, any project-related increase over existing ambient noise levels at the project's noise-sensitive receptors are evaluated to identify any significant adverse impacts under CEQA. (Ex. 301, p. 5.6-10.)

Most project operational activities will occur during the daylight hours, which include both intermittent and constant noises. Thus, the project's operational noise levels are compared to the existing daytime ambient average (L_{eq}) noise levels at the project's noise-sensitive receptors. (Ex. 301, p. 5.6-10.)

At monitoring locations LT-1, LT-2 and ST-2, as shown in **Noise Table 3** above, the addition of project operational noise levels to ambient noise levels will result in increases of 5 dBA or less above ambient levels, which are always regarded as a less-than-significant impact. Therefore, the above noise impact at LT-1, LT-2 and ST-2 will be less than significant. (Ex. 301, p. 5.6-11.)

At monitoring location ST-1, the addition of project operational noise to the ambient noise level will result in an increase of 6 dBA above the ambient level (refer to **Noise Table 3**). Although such an increase will be noticeable, operations will occur during the daylight hours; therefore, it is will not likely cause disturbance. Thus, this impact is considered to be less than significant. (Ex. 301, p. 5.6-11.)

The predicted project nighttime noise levels resulting from facility-related activities are summarized above in **Noise Table 4** above.

Because during the nighttime, most intermittent noises cease, noise that stands out at night is most represented by the background noise, or L_{90}. For residential receptors, project noise emissions are evaluated by comparing them with nighttime ambient background levels, which are typically lower than daytime levels; this evaluation assumes that the potential for public annoyance from power plant noise is greatest at night when residents are trying to sleep. It is considered prudent to average the lowest nighttime hourly background noise levels to arrive at a reasonable baseline for comparison with the project's predicted noise level. (Ex. 301, p. 5.6-11.)

At all monitoring locations, the addition of project operational noise to the ambient noise level will result in increases of 5 dBA or less above ambient background levels (see **Noise Table 4**); these impacts are considered less than significant. (Ex. 301, p. 5.6-12.)

NOISE-4 will ensure that both daytime and nighttime noise levels due to project operation will not exceed the levels identified in **Noise Tables 3 and 4**. (Ex. 301, p. 5.6-11.)

Winds and temperature gradients will not likely intensify power plant noise significantly at nearby noise-sensitive receptors, due to the receptors' locations relative to the power plant and the prevailing wind direction. To ensure this, Condition of Certification **NOISE-4** requires that the power plant's noise level be measured at these receptors during a windy day. Therefore, noise impacts related to wind will be less than significant. (Exs. 1, p. 5.8-40, 301, p. 5.6-12.)

<u>Tonal Noises.</u> Tonal noises are individual sounds (such as pure tones) which, while not louder than permissible levels, stand out in sound quality. The Applicant plans to address overall noise in project design, and to take appropriate measures, as needed, to eliminate tonal noises as possible sources of annoyance. To ensure that tonal noises do not cause public annoyance, Condition of Certification **NOISE-4** will require mitigation measures, if necessary, to prevent project-related tonal noises. Therefore, impacts related to tonal noises will be less than significant. (Exs. 1, pp. 5.8-39 – 5.8-41, 301, p. 5.6-12.)

Linear Facilities. All water pipes and gas pipes will be underground and therefore silent during plant operation. Noise effects from electrical interconnection lines typically do not extend beyond the lines' right-of-way easements and will be inaudible to receptors. Thus, noise impacts related to linear facilities will be less than significant. (Exs. 1, p. 5.8-39, 301, p. 5.6-12.)

Vibration. The operating components of a simple cycle power plant consist of high-speed gas turbines, compressors, and various pumps. All of these pieces of equipment must be carefully balanced in order to operate; permanent vibration sensors are attached to the turbines and generators. Experience with numerous previous projects employing similar equipment indicates that ground-borne vibration from the AMS project will be undetectable by any likely receptor, and related impacts will be insignificant. (Ex. 301, pp. 5.6-12 - 5.6-13.)

In addition, none of the project equipment is likely to produce noticeable low frequency noise (airborne vibration) beyond the project site boundaries. This makes it highly unlikely that the AMS project will cause perceptible airborne vibration effects (such as rattling of windows and of the walls of lightweight structures) at any offsite noise-sensitive receptor; impacts will be insignificant. (Ex. 301, p. 5.6-13.)

Worker Exposure to Noise. The project will include measures to protect operating and maintenance workers from noise hazards. Signs will be posted in areas of the plant with noise levels exceeding 85 dBA (the level that OSHA recognizes as a threat to workers' hearing), and hearing protection will be required and provided. (Ex. 301, p. 5.6-13.)In addition, Condition of Certification **NOISE-5** will ensure that plant operation and maintenance workers are adequately protected. Therefore, impacts related to worker exposure to noise will be less than significant.

6. Cumulative Impacts

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. [Cal. Code Regs., tit. 14, § 15065(a)(3).]

The evidence establishes that there are no other known projects in the vicinity, which, when combined with the AMS project, will result in cumulative noise impacts. (Exs. 1, p. 5,8-40, 301, p. 5.6-13.)

FINDINGS OF FACT

Based on the uncontroverted evidence of record, the Commission makes the following findings:

1. Construction and operation of the AMS project will not significantly increase noise levels above existing ambient levels at nearby receptors.

2. Construction noise levels are temporary and transitory in nature and will be mitigated to the extent feasible by employing measures such as sound reduction devices and limiting construction to daytime hours in accordance with local noise control laws and ordinances.

3. Pile driving activities will not be required for construction of the AMS project.

4. Operational noise will not cause significant adverse impacts to nearby residences.

5. The project owner will implement measures to protect workers from injury due to excessive noise levels.

6. The AMS project will not create ground or airborne vibrations that will cause significant off-site impacts.

7. Implementation of the Conditions of Certification, below, ensure that project-related noise will not cause significant adverse impacts to sensitive noise receptors.

8. The noise from the AMS project will not create or contribute to a significant adverse cumulative impact.

CONCLUSION OF LAW

1. The Commission concludes that the AMS project, if built and operated in conformance with the proposed conditions of certification below, will comply with all applicable noise and vibration LORS and will produce no significant direct, indirect or cumulative adverse noise impacts on people within the project area.

CONDITIONS OF CERTIFICATION

NOISE-1 Prior to ground disturbance, the project owner shall notify all residents and business owners within two miles of the project site boundaries and within ½-mile of the linear facilities, by mail or by other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours a day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction where it is visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: At least 15 days prior to the start of ground disturbance, the project owner shall transmit to the compliance project manager (CPM) a statement, signed by the project owner's project manager, stating that the above notification has been performed, and describing the method of that notification. This communication shall also verify that the telephone number has been established and posted at the site, and shall provide that telephone number.

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all legitimate [46] project-related noise complaints. The project owner or authorized agent shall:

Use the Noise Complaint Resolution equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;

- Attempt to contact the person(s) making the noise complaint within 24 hours;
- Conduct an investigation to determine the source of noise in the complaint;
- If the noise is legitimate 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 Form (below), or a functionally

[46] A legitimate complaint refers to a complaint about noise that is confirmed by the CPM to be disturbing, and that is caused by the AMS project as opposed to another source (as verified by the CPM). A legitimate complaint constitutes a violation by the project of any noise condition of certification (as confirmed by the CPM), which is documented by an individual or entity affected by such noise.

- 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.

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-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 55 dBA measured at or near monitoring location LT-1 (15563 Edie Road), an average of 43 dBA measured at or near monitoring location LT-2 (41234 Harper Lake Road), an average of 55 dBA measured at or near monitoring location ST-1 (15635 Lockhart Road), and an average of 49 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 24 dBA measured at or near monitoring location LT-1 (15563 Edie Road), an average of 30 dBA measured at or near monitoring location LT-2 (41234 Harper Lake Road), an average of 24 dBA measured at or near monitoring location ST-1 (15635 Lockhart Road), and an average of 24 dBA measured at or near monitoring location ST-2 (15654 Roy Road). All noise limitations contained in this condition of certification 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 to be representative of the normal daytime environment in the project area. 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 shortterm 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.

Verification: The survey shall take place within 90 days of the project first achieving a sustained output of 90% or greater of rated capacity. Within 30 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 30 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.

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.

NOISE-6 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 for limited work approved by the CPM:

Mondays through Saturdays: 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.

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.

NOISE-7 If a traditional, high-pressure steam blow process is used, the project owner shall monitor steam blow noise at the closest receptors, LT-1, ST-2, and ST-1, to ensure the noise of steam blows does not exceed 60 dBA at these locations. If this noise level is unattainable, the project owner shall either relocate the residents for the duration of steam blows to a location further away from these activities, or equip steam blow piping with a temporary

silencer that quiets the noise of steam blows to no greater than 60 dBA, measured at LT-1, and ST-2., and ST-1. The steam blows shall be conducted between 7:00 a.m. and 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.

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. During steam blow activities, noise levels will be monitored at receptor locations LT-1, ST-1, and ST-2 and the results reported to the CPM.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

Abengoa Mojave Solar Project
(09-AFC-5)

NOISE COMPLAINT LOG NUMBER _____

Complainant's name and address:

Phone number: _____

Date complaint received: _____
Time complaint received: _____

Nature of noise complaint:

Definition of problem after investigation by plant personnel:

Date complainant first contacted: _____

Initial noise levels at three feet from noise source _____dBA Date: _____

Initial noise levels at complainant's property: _____ dBA Date: _____

Final noise levels at three feet from noise source: _____ dBA Date: _____

Final noise levels at complainant's property: _____ dBA Date: _____

Description of corrective measures taken:

Complainant's signature: _____ Date: _____

Approximate installed cost of corrective measures: $ _____
Date installation completed: _____
Date first letter sent to complainant: _____ (copy attached)
Date final letter sent to complainant: _____ (copy attached)

This information is certified to be correct:

Plant Manager's Signature: _____

(Attach additional pages and supporting documentation, as required).

E. VISUAL RESOURCES

Visual resources constitute the natural and cultural features of the landscape that contribute to the visual character or quality of the environment. CEQA requires an examination of a project's visual impacts in order to determine whether the project has the potential to cause substantial degradation to the existing visual character of the site and its surroundings. (Cal. Code Regs., tit. 14 § 15382, Appen. G.)

The evidence presented on this topic was undisputed. (6/28/10 RT 62, 65-68, 72-76, 80-81, Exs.1, § 5.15, 4, 48 [§13.0], 301, §5.12, 306.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

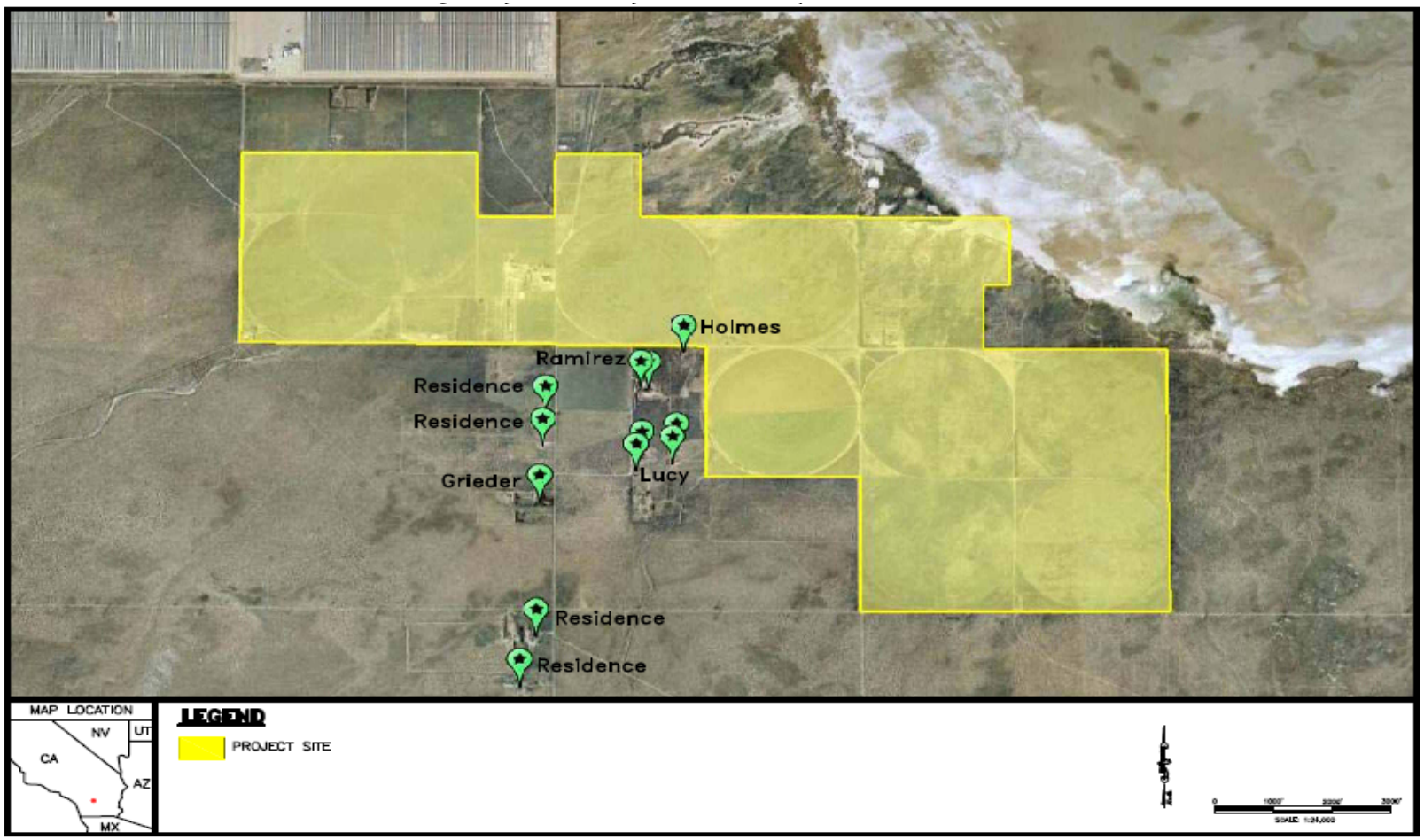
1. Setting and Project Description

The AMS site is located approximately nine miles northwest of the unincorporated community of Hinkley in unincorporated San Bernardino County, California. The project will occupy 1,765 acres of previously disturbed and now mostly abandoned agricultural lands in the vicinity of Harper Lake and Lockhart roads. The site is generally characterized by Mojave creosote scrub vegetation located on an expansive flat plain gently sloping toward Harper Dry Lake, approximately 1,000 feet northeast of the project site.

Black Mountain, a wilderness area managed by the federal Bureau of Land Management (BLM), is located approximately eight miles beyond the dry lake bed. State Route-58 (SR-58) trends five miles south of the project site, at background viewing distance. A wildlife viewing area at the southwest edge of the dry lake is managed and maintained by the BLM. Public access to a Watchable Wildlife Area is via Harper Lake Road and Lockhart Road. (Ex. 301, p. 5.12-3.)

The project vicinity is sparsely populated. Approximately a dozen residential structures (some abandoned) are located within one mile of the project site. No other residences are within a five-mile radius of the project. **Visual Resources Figure 1** below depicts the location of the known residences.

Visual Resources Figure 1
Abengoa Mojave Solar Project - Known Occupied Resident Locations



Source: Ex. 300

Other old, abandoned structures give the area a somewhat blighted appearance. The SEGS VIII and IX solar facilities are immediately adjacent to and northwest of the proposed AMS site north of Hoffman Road and west of Harper Lake Road. There are no other developed land uses in the area. The AMS project will be approximately twice as large as SEGS VIII and IX but based on similar technology and hardware will have similar visual character. (Ex. 301, p. 5.12-4.)

The project site offers distant views to Black Mountain. Overall, visibility to the plant site is limited by small undulations in the surrounding Mojave Desert plain.

The site is not visible from state routes, except for a very short section of SR-58 east of Harper Lake Road, and equally short segment of Highway 395 south of Kramer Junction, both at background distance. (Ex.1, Figure 5.15-1a.)

There are no distinctive geographic features on the AMS site. The flat-to-gently rolling character of the land and absence of trees provide for open and expansive viewing within the foreground (up to one-half mile), middle ground (one-half to three miles), and background (over three miles). Distant views are sometimes limited due to atmospheric haze or pollution. Large power lines and industrial developments are prominent elements of the otherwise open landscape.

The project will have two solar fields, identified as Alpha (884 acres in the northwest portion of the project area) and Beta (800 acres in the southeast portion of the project area). An additional 81 acres will be shared between the plant sites be used for off-site drainage improvements.

Each power island will have its own warehouse and control/administration building. Solar collector array (SCA) assembly buildings will be installed in the northeast portion of the Alpha solar field, which will be later converted to warehouses. The total square footage of the project buildings and pre-engineered enclosures (e.g., control/admin building, warehouse, electrical equipment enclosures, etc.) will be approximately 185,000 square feet.

An onsite transmission line interconnection substation will be located in the southwest corner of the Beta solar field. The sole off-site element associated with the project will be the connection of the AMS project-related transmission line to the existing Southern California Edison (SCE) Kramer - Cool Water 230-kV line on the southern border of the site.

Visible project features will include the SCAs, transmission towers, cooling towers and a variety of structures/buildings, identified by **Visual Resources Table 1** below, as well as perimeter chain-link fencing. (Ex. 301, p. 5.12-7.)

Visual Resources Table 1
Design Characteristics of Visually Prominent Project Features

Quantity	***Project Feature***	***Height*** *(ft)*	***Length*** *(ft)*	***Width*** *(ft)*
22,500	Solar Collector Arrays	21.1	39.4	18.9
32	Transmission Line Monopoles	80 - 110	25-in. base diameter	9-in. tip diameter
2	Steam Turbine Generator Building	72.5	42.1	107.8
2	Steam Generation	50	198	70
2	Cooling Towers	44	324	54
2	Mirror Modules Assembly Factory	44	295.3	262.5
2	Central E&C and Operations Building	32	163	109
2	Power Plant E&C Buildings	32	110	25
2	Heat Transfer Fluid Pump House	23	81.5	70
2	Auxiliary Boiler Building	30	50	28.6
2	Diesel Generator Building	30	40	12
2	Closed Cycle Cooling Buildings	30	39.7	18.9
2	Cooling Tower Electrical Buildings	16.5	57	20
2	Heat Transfer Fluid Electrical Buildings	16.5	49.2	26.2
2	Water Treatment Building	16.5	50.4	36.4
2	Warehouse	16.5	170	80

Source: Ex. 301, p. 5.12-7

The project design includes a number of elements related to facility color, light shielding and vegetative screening to minimize visual effects. These elements include:

- Excluding the solar collectors, low reflectivity finishes in neutral desert tan colors that reference the surrounding environment will be used on the surfaces of all aboveground structures, including: the control, administration, warehouse, water treatment, SCA assembly and substation buildings; as well

as enclosures for mechanical and electrical equipment; and water storage tanks. This will minimize the contrast of the structures with their backdrop.

- Specification of all substation equipment with low reflectivity, neutral finishes. All insulators at the substations and on the takeoff equipment will be non-reflective and non-refractive. Chain-link fences surrounding the substation and the project site will have a dulled finish to reduce contrast with the desert surroundings.
- Use of painted light-gray colors or dulled galvanized steel on tubular steel poles (TSPs) used for overhead transmission lines. If concrete monopoles are used, they will be natural concrete with light-gray colors. All insulators specified will be made of materials that do not reflect or refract light. All conductors specified for the project will be non-specular (treated at the factory to dull their surfaces to reduce their potential to reflect light).
- All construction-related operations at the construction laydown area will be kept clean and orderly. Construction debris will be removed promptly at regular intervals, not to exceed two weeks at any one location.
- Restriction of all outdoor lighting to the minimum required to meet safety and security standards, with all light fixtures hooded to prevent light from spilling off the site or up into the sky. All outdoor lights will have sensors and switches to permit turn off when lighting is not required.
- To assist with visual screening of the project, the Applicant will consult with residential property owners within one-half mile of the project site boundary for input regarding off-site-planting on the properties. (Ex. 301, pp. 5.12-7 - 5.12-8.)

2. Impacts Analysis

To assess the significance of a visual impact, we must determine whether the project will:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare which will adversely affect day or night time views in the area. (14 Cal. Code Regs., Appen. G. Aesthetics.)

Impacts to Scenic Vistas and Resources. There are no specific scenic vista points of notable importance in the project viewshed. Nor are there historic buildings or other potential scenic resources to be affected by the AMS. There are no designated federal scenic byways or designated state scenic highway corridors in the vicinity of the project. (Ex. 301, p. 5-12-11.)

Impacts to the Existing Visual Character or Quality of the Site and its Surroundings.

The project's visual setting is described in terms of existing visual character and quality. Visual character refers to attributes of the visual setting and is objectively descriptive. Visual quality defines a landscape using characteristics broadly recognized as valued and preferred by most viewers. These include the presence of undisturbed natural features, particularly vegetation and water, and visual attributes typically identified as preferred or valued in various professionally accepted assessment methodologies, such as vividness (memorability), unity and intactness. (Ex. 301, p. 5.12-11, Appendixes VR-1, VR-2.)

Visual quality is rated in the context of the project's broad regional landscape setting. Landscapes that are visually degraded compared to those common within the region are assigned a low visual quality rating and landscapes that are common within the region are assigned a moderate visual quality rating. Landscapes that are unusually scenic and vivid within the region are given a high visual quality rating. (Ex. 301, p. 5.12-11.)

3. Construction Impacts

Construction is expected to occur over a 26-month period. Temporary construction laydown and parking areas will be located on the project site. Equipment and materials will be delivered to the plant site by truck. The construction sequence will include the following general steps with a potential for visual impact:

- Site Preparation. This includes demolition of existing structures, grading, and preparation of drainage features. Grading for the solar field and power island will be completed during the first six months of construction. Finish grading and repairs will follow as portions of the project are completed.

- Foundations. This includes excavations for large equipment such as steam turbine generators (STGs), solar steam generators (SSGs), generator set-up

(GSU), cooling tower, solar field footings, and power island ancillary foundations.

- Major Equipment Installation. This includes larger equipment installation, assembly of solar field components in the onsite SCA assembly buildings and their installation on foundations.

Project construction activities can be seen from ground level views occurring within approximately one mile of the project site. In addition, construction traffic associated with work force and equipment deliveries will be noticeable to travelers on Harper Lake Road.

According to the evidence, project construction will cause moderate to high levels of visual disturbance, but will be seen by few people due to the due the remote location of the project site. (Ex. 301, p. 5.12-12.) We therefore conclude that the visual impact of construction activities will be less than significant.

4. Operational Impacts

The Applicant and Staff identified the following eight key observation points (KOPs) [47] from which to conduct detailed analyses of the AMS project and to obtain existing condition photographs and prepare photo simulations representing the most critical viewing locations:

- KOP 1 – View from Harper Lake Road just north of Phoenix Road, 2 to 2.75 miles south of the nearest project site boundaries, looking north;
- KOP 2 – View from Harper Lake Road south of Roy Road, 0.75 to 1.0 mile south of the nearest project site boundaries, looking north;
- KOP 3 – View from Roy Road east of Edie Road, 500 feet from the closest project boundary (west boundary of the Beta solar field), looking east;
- KOP 4 – View from Edie Road approximately 500 feet south of Lockhart Ranch Road, looking east;
- KOP 5 – View from Lockhart Ranch Road east of Edie Road, looking east;
- KOP 6 – View from BLM Watchable Wildlife Area, 650 feet from the Beta field SCAs, looking south;
- KOP 7 – View from BLM Watchable Wildlife Area, 2,000 feet from the Alpha field SCAs, looking west; and

[47]The use of KOPs or similar view locations is common in visual resource analysis. The U.S. Bureau of Land Management (USDI BLM 1986a, 1986b, 1984) and the U.S. Forest Service (USDA Forest Service 1995) use such an approach.

- KOP 8 – View from Fossil Bed Road and Black Canyon Road, 5.7 miles from the project site, looking southwest.

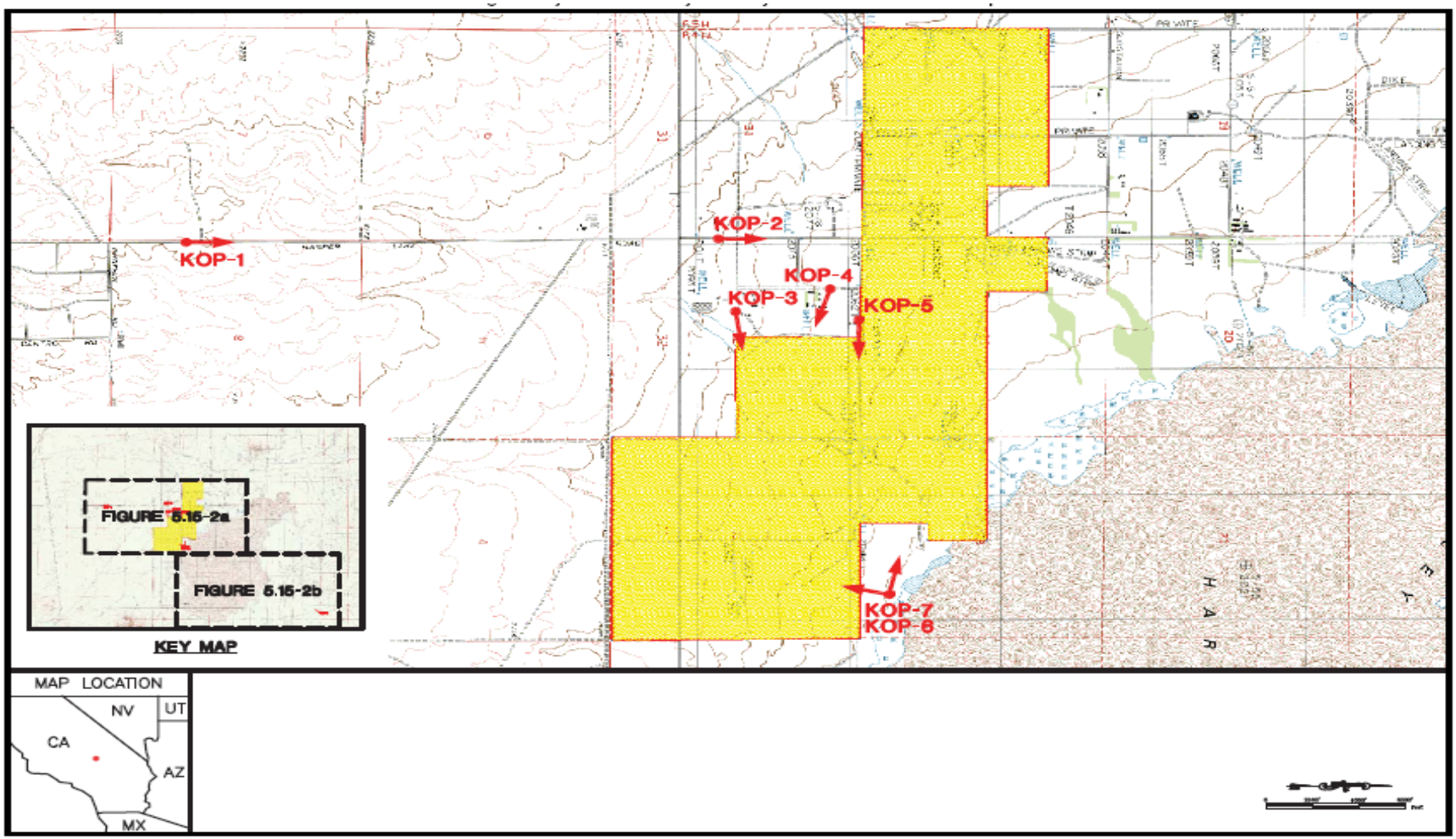
Visual Resources Figures 2 and 3 below show the locations of the KOPs.

///

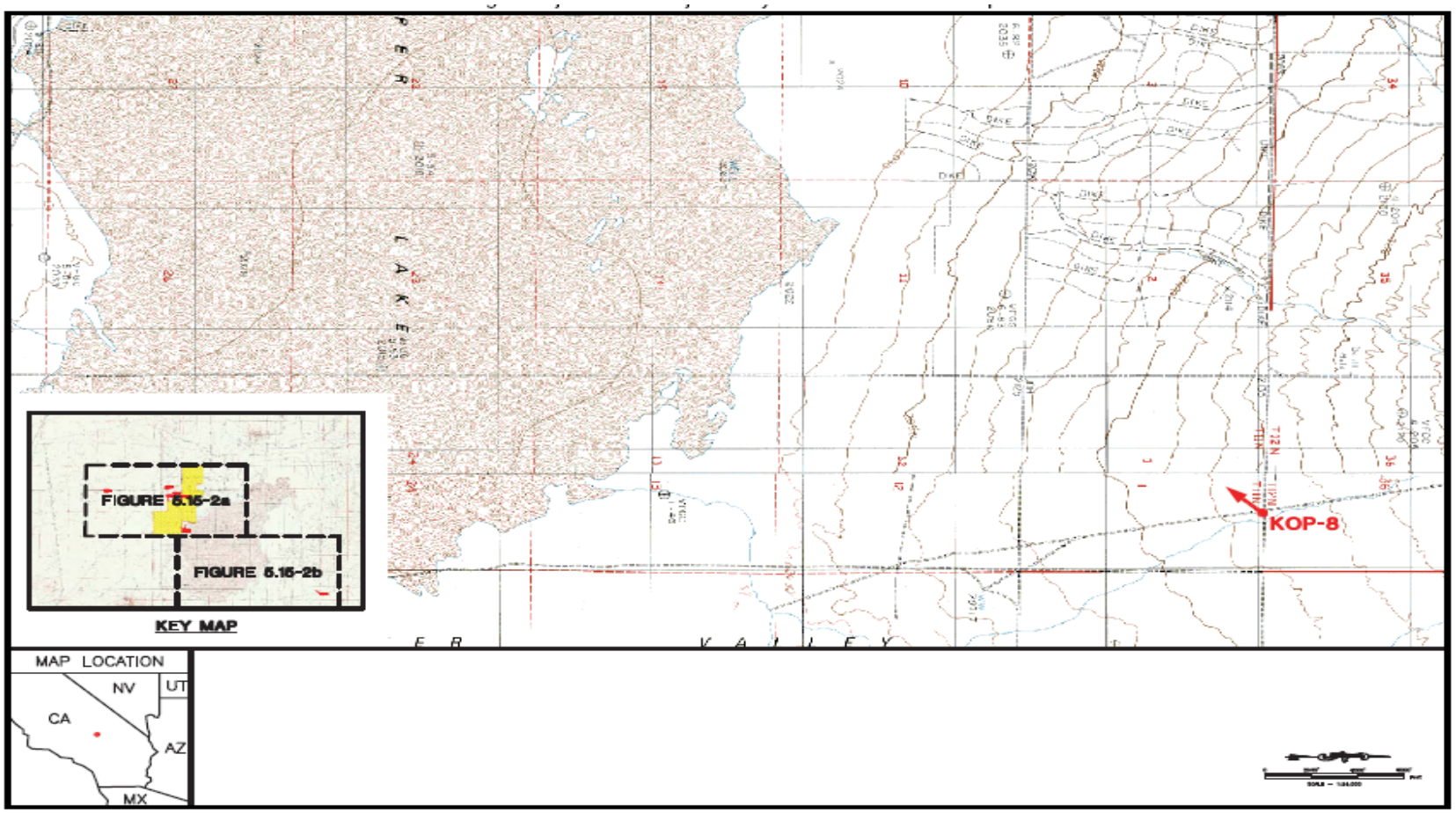
///

///

Visual Resources – Figure 2
Key Observation Points Map 1



Visual Resources - Figure 3
Key Observation Points Map 2



Assessment of impact significance from each of the KOPs is based on visual sensitivity combined with project-related visual changes to setting. A visual sensitivity evaluation assesses existing visual quality, viewer concern, and viewer exposure (i.e., the number of viewers combined with visibility to the site and view duration). Visual change evaluation assesses project-introduced contrast, dominance of project features, and view disruption.

Detail is provided for each of these topics by KOP. (Exs. 1, pp. 5.15-41 – 5.15-49, 301, pp 5.12-13 - 5.12-24, 301, pp. 5.12-9 – 5.12-24.)

KOP-1: Harper Road Near Phoenix Road

KOP 1 is located on Harper Lake Road, the primary north-south road leading to the project area and providing access to rural residences and the Harper Dry Lake Watchable Wildlife Area. Views are characteristic of the Western Mojave Desert landscape and are predominantly undeveloped with foreground and middle ground views of native Mojave Desert creosote scrub. Utility poles paralleling Harper Lake Road leading from the immediate foreground and multiple, large transmission line towers in the middle ground of the view are noticeable built features. Background views are of distant mountains.

The view from KOP 1, as shown **Visual Resources Figure 4,** exhibits a panoramic open space character and limited development, but lacks complexity and variety of landscape features. It is a desert landscape lacking a pristine quality due to the presence of discordant elements such as the road, utility lines, and large transmission lines. The landscape has a moderate level of unity since the expanse of desert vegetation contributes to a harmonious, unified character.

Viewer exposure from KOP 1 is low, due to few viewers (typically motorists) and relatively short view duration. The project site is only partially seen due to topography and distance, and comprises a small element within an open, expansive view.

The visual quality, viewer sensitivity, and viewer exposure combine to result in low overall visual sensitivity for KOP 1.

Visual Resources Figure 4

KOP 1 – View From Harper Lake Road near Phoenix Road - Pre-Project

Visual Resources Figure 5

KOP 1 – View From Harper Lake Road near Phoenix Road - Post Project

Visual Resources Figure 5 above is a photo simulation of the project as it will appear from KOP-1. The SCA fields will be at least partially within view and will extend over a wide area within the view. At two to three miles distance, project features will not be distinct. Facilities at the power block area will appear as a concentration of forms of varying heights and widths.

Due to the distance of the project from KOP-1, visual contrast introduced by the project features overall will be Low. Contrasts associated with the power block facilities will be moderate due to their geometric forms and proposed coloring (light shades of beige and brown). The facilities will be seen in the middle-ground distance zone against a backdrop of desert and distant hills. In the photo simulation, the buildings in the power block are lighter in color than the backdrop. Contrast could thus be lowered with implementation of Condition of Certification **VIS-1**, requiring surface treatment in colors that will blend with the background.

The project will be noticeable but will not attract attention more than other man-made elements within view. None of the project features will protrude into the skyline, mountains or hills of the background distance zone. Although the project covers a large area, it is viewed in an open and expansive context in which both the intact, natural foreground and distant mountain ridgelines visually dominate. Thus, project dominance from KOP-1 will be Low

The project will not disrupt any scenic views or vistas from KOP-1. Further, even though the project will cover a large area of land, except for the power block (which still remains very visually subordinate at this distance), the apparent height of most features will be low.

Based on the noted project-related contrast, dominance and view disruption, the overall visual change to the scene as a result of the project is low.

Thus, the evidence shows that the introduction of the project into the KOP-1 viewshed will result in a less-than-significant impact to visual resources based on the low overall visual sensitivity and low overall visual change. Since the proposed color shades for many of the project features in the power block are key to reducing the visual effect of the project, however, Condition of Certification **VIS-1** is recommended to ensure that all project facilities, including the non-mirror portions of the SCAs, support a color palette that minimizes visual contrasts to the greatest extent practicable. (Exs. 1, pp. 5.15-42 – 5.15-43, 301, p-. 5.12-13 – 5.12-14.)

KOP-2: Harper Lake Road South of Roy Road

The current view from KOP is shown by **Visual Resources Figure 6** below. This KOP is located near two private residences west of Harper Lake Road. The existing visual quality of the view from KOP-2 is moderate. Foreground and middle-ground views are of native desert vegetation and rural residential development west of Harper Lake Road, with prominent utility poles and overhead lines paralleling the road. Background views are of distant mountains. The view is not highly vivid, and the landscape is not intact. Unity is somewhat impaired by the presence of foreground development. The view from KOP-2 exhibits a general open space character, but has a limited diversity of landforms, and contains discordant development.

Viewer concern from KOP-2 is considered moderate based on moderate visual sensitivity for motorists and high visual sensitivity for residents.

Viewer exposure from KOP-2 is moderately low. The number of viewers is very low and visibility of the project site is moderate at this distance. The project site is seen in the context of an open, expansive view and other existing development.

The visual quality, viewer concern and viewer exposure combine to result in moderate overall visual sensitivity for KOP-2.

Visual Resources Figure 7 below simulates the AMS project as it will appear from KOP-2. Most project features will be seen from KOP-2 at distances from three-quarters to two miles. The SCA fields will be at least partially within view and will extend over a wide area. Some project features detail will be evident. The power block east of Harper Lake Road will appear as a concentration of blocky vertical, geometric forms of varying heights and widths. The project transmission line will be visible.

Visual Resources Figure 6

KOP 2 – View from Harper Lake Road South of Roy Road – Pre Project

Visual Resources Figure 7

KOP 2 – View from Harper Lake Road South of Roy Road – Post Project

Contrasts associated with the power block facilities will be moderate due to their vertical, geometric line and form and the contrasting, relatively light shade of colors. The facilities will be seen in the near middle-ground distance against a backdrop of darker-colored desert and distant hills. The SCA fields contrast is anticipated to be amplified by bright glare under typical conditions.

Project dominance from KOP-2 will be moderate. Project features will attract about the same amount of attention as other man-made elements within view and will not protrude into the skyline or mountain ridge in the background. Even at this relatively close distance, the project will occupy a narrow portion of the overall view and remain subordinate to the dominant foreground landscape and background ridges.

View disruption will be low. The project will cover a large area, but the apparent height of the SCA fields will be low. Power block facilities will appear tall but do not substantially interfere with views of the mountains in the distance.

Based on the noted project-related contrast, dominance and view disruption, the overall visual change from KOP-2 will be moderate.

The evidence shows that in the context of moderate overall visual sensitivity of the scene, the moderate overall visual change of the project will result in a less-than-significant visual impact. (Exs. 1, p. 5.15-43-5.15-44, 301, pp. 5.12-15 - 5.12-16.)

<u>KOP-3: Roy Road East of Edie Road</u>

Visual Resources Figure 8 below represents an unobscured view of the project site as currently seen by residents from KOP-3, which is an area from an unpaved road providing access to a few private residences.

The existing visual quality is low-to-moderate. The landscape seen from KOP-3 is largely disturbed active or abandoned agricultural land. A swath of desert vegetation exists in the near foreground, beyond which the flat, non-descript agricultural fields extend from the foreground up to about two miles. Distant hills form the backdrop to the east but are not highly vivid or dominant due to distance. Existing transmission lines can be seen near the right edge of the view.

Viewer concern from KOP-3 is considered to be moderate to high since the view is from a public access road but primarily represents local residents.

Visual Resources Figure 8

KOP 3 – View from Roy Road East of Edie Road – Pre Project

Visual Resources Figure 9

KOP 3 – View from Roy Road East of Edie Road – Post Project

Viewer exposure at KOP-3 is low-to-moderate. Visibility is unrestricted, and the leading edge of the project is in the foreground. The duration of views from residences will be long, but the number of viewers at KOP-3 is very low.

The visual quality, viewer concern, and viewer exposure combine to result in moderate overall visual sensitivity from KOP 3.

Visual Resources Figure 9 above simulates the project site from KOP-3 after project construction. The SCA mirrors will be highly reflective which, under certain conditions, will cause a high level of contrast. The project will extend across the entire scene.

The visual contrast introduced by the project will be high. There are open views to the site and the industrial character of the SCAs, power block, and transmission line will visually contrast in form, line, colors and textures with the open surrounding desert. The extent and continuity of the SCA field will somewhat mimic the horizontal quality of the agricultural land it will replace at a distance, but in the foreground the contrasting character will be highly evident.

Project dominance from KOP-3 will be high. The project will occupy an extensive area and will alter the character from agricultural open space to a developed site of mirrored structures, some of which will be in the foreground.

View disruption will be moderate. The project will disrupt or block views of the lower portions of the distant hills and mountains that can be seen to the east in the background distance zone from KOP-3.

Based on the noted project-related contrast, dominance and view disruption, the overall visual change to the scene as a result of the project is high.

The evidence shows that in the context of moderate visual sensitivity, the high visual change of the project will result in a less-than-significant adverse visual impact. The few residents experiencing this view, however, will be strongly affected. In an effort to provide relief from permanent views of the project from residences located within one-half mile of the project, Condition of Certification **VIS-2** (Offsite Landscape Screening) will be implemented. (Exs. 1, pp. 5.15-44-5.15-45, 301, pp. 5.12-16 - 5.12-18.)

KOP-4: Edie Road South of Lockhart Ranch Road

KOP-4 currently has open views of the project site that will be seen by residents in the area. SCAs will be located on both sides of Lockhart Ranch Road. The SCAs south of Lockhart Ranch Road will be about 1,200 feet east of KOP 4. (See **Visual Resources Figure 10** below.)

Visual Resources Figure 10

KOP 4 – View from Edie Road South of Lockhart Ranch Road – Pre Project

Visual Resources Figure 11

KOP 4 – View from Edie Road South of Lockhart Ranch Road – Post Project

The existing visual quality is low-to-moderate. The landscape seen from KOP-4 is a mixture of disturbed agricultural land and desert scrub vegetation in the near foreground. Hills form the backdrop but are not prominent due to their distance. Overhead utilities are visible.

Viewer concern from KOP-4 is considered to be moderate-to-high. The view is from a public access road but primarily represents local residents.

Viewer exposure at KOP-4 is low-to-moderate. Visibility to the project is mostly unrestricted, and parts of the project will be in the foreground. The duration of views from residential properties will be long; however, the number of viewers at KOP 4 is very low.

The visual quality, viewer concern, and viewer exposure combine to result in moderate overall visual sensitivity for KOP-4.

Visual Resources Figure 11 above simulates the project site from KOP 4 after construction. The SCA mirrors will be highly reflective creating a high level of contrast. The project will extend past the left edge of the photo image and beyond since it will also occupy the north side Lockhart Ranch Road.

The visual contrast introduced by the project from KOP 4 will be high due to open views to the industrial SCAs, resulting in visual contrasts in form, line, colors and textures with the surrounding desert. The Alpha field power block is expected to be visible from this KOP. The extent of the SCA fields and continuity of their form will somewhat mimic the horizontal quality of the agricultural lands they will replace, but will present strong overall contrast in the foreground. The light-colored project features will contrast with the darker foreground and background, amplifying the level of contrast.

Project dominance from KOP 4 will be high. The project will occupy an extensive area and will alter the character from agricultural open space to a developed site of mirrored structures, some of which will be in the KOP 4 foreground.

View disruption will be high. The project will disrupt or block views of the mountains seen to the east in the background distance zone.

Based on the noted project-related contrast, dominance and view disruption, the overall visual change to the scene as a result of the project is high.

The evidence shows that the introduction of the project in the KOP 4 view will result in an adverse but less-than-significant visual impact**.** However, the few residents experiencing this view will be strongly affected. In an effort to provide relief from permanent views of the project from the few residences located within one-half mile of the project, Condition of Certification **VIS-2** (Offsite Landscape Screening) is recommended. (Exs. 1, p. 5.15-45, 301, pp. 5.12-18 – 5.12-19.)

KOP-5: Lockhart Ranch Road East of Edie Road

KOP-5 is on Lockhart Ranch Road east of Edie Road. This KOP is along the south edge of the Alpha solar field and about 400 feet west of the Beta solar field. The view is looking east. **Visual Resources Figure 12** below shows the current view of the project site.

Visual Resources Figure 12

KOP 5 – View from Lockhart Ranch Road East of Edie Road – Pre Project

Visual Resources Figure 13

KOP 5 – View from Lockhart Ranch Road East of Edie Road – Post Project

The existing visual quality of the view from KOP-5 is low-to-moderate. The foreground of the view contains native desert scrub, but views toward the project site are predominantly of active and abandoned agricultural fields. Foreground views also include rural residential and farm development north of Lockhart Ranch Road, some of which appears abandoned. Utility poles and overhead lines edge the south side of Lockhart Ranch Road. Background views of distant mountains lack vividness and prominence. Some ornamental landscape trees in the vicinity appear dead or in poor condition, detracting from visual intactness.

Viewer concern from KOP-5 is considered to be moderate. Individuals using this part of Lockhart Ranch Road primarily will be traveling to and from the Harper Dry Lake Watchable Wildlife Area. Motorists are considered to have moderate visual sensitivity. One residence was identified in the vicinity of the KOP, although it appeared to be abandoned.

Viewer exposure to the project from KOP-5 is low. Visibility of the project site is very high since viewers are in the midst of the SCA fields; however, the number of viewers is very low. The home in the view appeared to be abandoned.

The visual quality, viewer concern, and viewer exposure combine to result in low-to-moderate overall visual sensitivity for KOP-5.

Visual Resources Figure 13 above simulates the project from KOP 5. In addition to features discussed below, the power blocks will be visible from Lockhart Ranch Road, although they are not within the view depicted from KOP 5.

The visual contrast introduced by the project from KOP 5 will be high. There will be open views of the project in the foreground on both sides of Lockhart Road although the Alpha field on the north side will be set back at least 300 feet. The SCAs, power blocks, and transmission line will contrast with form and textures of the existing setting. Perimeter fencing will be a prominent feature at this distance.

Project dominance from KOP 5 will be high. The project will occupy an extensive area and will be in the foreground, strongly dominating the entire field of view.

View disruption will be moderate-to-high. The project will disrupt or block views of the lower portions of distant hills and mountains seen to the east and southeast in the background, and mountains to the northwest in their entirety, due to the proximity of the perimeter fencing.

Based on the noted project-related contrast, dominance and view disruption, the overall visual change to the scene as a result of the project is high.

The evidence shows that the AMS project in the view from KOP 5 will result in an adverse but less-than-significant impact to visual resources. Although the overall level of visual change will be high, it will result in a less than significant visual impact because the Visual Sensitivity of this KOP is low-to-moderate. Sensitivity is low because existing visual quality is moderately low and there are very few viewers that will see the project from KOP 5. (Exs. 1, pp. 5.15-45 - 5.15-46, 301, pp. 5.12-19 - 5.12-21.)

<u>KOPs -6 and -7: BLM Watchable Wildlife Area</u>

Visual Resources Figures 14 and 15 below depict current views from the Harper Dry Lake Watchable Wildlife Area looking south (KOP-6) and west (KOP-7). The Watchable Wildlife Area consists of a gravel access road and parking area with gravel footpaths leading to observation decks. These public facilities are on the west side of the dry lake. Views from the observation decks are oriented to the east and north and visitors observing wildlife look in the opposite

direction from the project site (the project will be behind them). Visitors will see the project when returning to the parking area.

The existing visual quality is low in the southward view from KOP-6 and moderate from KOP-7. The view from KOP-6 is nondescript, and is comprised of abandoned agricultural land with desert vegetation disturbed by the parking area in the foreground. Utility lines and poles along Lockhart Ranch Road are in view. Large transmission lines are visible on the horizon and against the sky at a distance of just over one mile. Due to topography, the view does not extend beyond these transmission lines and there is no distant backdrop of mountains. The view to the west from KOP-7 extends for many miles to some far distant hills. Desert is seen in the foreground, backed by some trees.

Visual Resources Figure 14

KOP 6 – Views from the South Harper Lake Watchable Wildlife Area – Pre Project

Visual Resources Figure15

KOP 6 – Views from the West Harper Lake Watchable Wildlife Area – Pre Project

Viewer concern from KOPs -6 and -7 is considered moderate. Viewer focus is on wildlife in the wetlands to the east, observed in views away from the project site.

Viewer exposure at KOPs -6 and -7 is low. Although visibility to the project is unrestricted, view duration to the project will be short since views will occur primarily as visitors are returning to the parking lot from the observation decks. Further, the number of viewers at KOPs -6 and -7 is assumed by the BLM to be very low although no official counts or formal estimates of visitors to the area have been made.

The visual quality, viewer concern, and viewer exposure combine to result in moderate-to-low overall visual sensitivity for KOPs -6 and -7. (

Visual Resources Figures 16 and 17 below depict photo simulations of the project site from KOPs -6 and -7. The SCA mirrors will be highly reflective which, under certain conditions, will cause a high level of contrast. The project will extend across the entire scene in both views.

The visual contrast introduced by the project as seen from KOPs -6 and -7 will be High. The SCAs, power block facilities, and transmission line will result in contrasts in form, line, colors and textures with the surrounding landscape. The extent and continuity of the SCA fields will somewhat mimic the horizontal quality of the landscape they will replace from KOP -7, but the light, greenish-colored SCAs will contrast with the darker colored background mountain ridges, the yellow-tan color of dry grasses, and the darker color of scrub vegetation.

Project dominance from KOP-6 will be high and moderate from KOP-7. The project will occupy a vast area and have a distinctly different character than the agricultural open space and surrounding desert. It will become an industrial site made up of rows of mirrored structures, some of which will be seen in the near middle ground from KOP-6. Nonetheless, spatial dominance of both views is considered moderately low due to the orientation of visitor views at this destination in the opposite direction.

View disruption from KOP-6 will be low since views do not extend beyond the project site. From KOP-7, view disruption will be moderate as the project will replace or block views of some existing trees and will block the portions of the distant hills and mountains that can now be seen to the west in the background. However, overall view orientation at this destination is generally toward Harper Dry Lake.

Visual Resources Figure 16

KOP 6 – Views from the West Harper Lake Watchable Wildlife Area – Post Project

Visual Resources Figure 17

KOP 7 – Views from the West Harper Lake Watchable Wildlife Area – Post Project

Based on the noted project-related contrast, dominance and view disruption, the overall visual change to the scene as a result of the project is high at KOP-6 and moderate at KOP-7.

The evidence shows that existing visual quality in this location is compromised by the existing SEGS VIII and IX facilities and lacking in vivid, scenic features. The number of viewers at this location is extremely low and observation of wildlife in the wetlands to the east (away from the project site) is the principal reason for visitors to come to this location. For these reasons, viewer concern with scenic quality is not considered to be primary, and the change in visual character due to the project, though adverse, will not substantially affect the wildlife observation of viewers. As a result, project impacts to views are adverse but less than significant at KOPs-6 and -7. (Exs. 1, pp. 5.15-46 – 5.15-48, 301, pp. 5.12-21 - 5.12-23.)

KOP-8: Fossil Bed Road Near Black Canyon Road

KOP-8 is located at the intersection of roads providing access to BLM-managed recreation areas, including the Black Mountain Wilderness. It provides very long distance, un-obstructed views in the direction of the project site as shown by **Visual Resources Figure 18** below. The view is characterized by the flat plain of the Mojave Desert. Viewers at this location include persons seeking recreation. The Black Mountain Wilderness Area is northeast of this location.

The existing visual quality is moderate to high. The landscape seen from KOP-8 appears as intact, undisturbed desert. Harper Dry Lake shows as a thin, light-colored line at a distance of about three miles beyond the desert scrub that extends from the foreground. Very distant hills form the backdrop. Vividness of the scene is low-to-moderate while intactness and unity of the landscape are both high.

Viewer concern from KOP-8 is considered high since most viewers are people engaged in recreation.

Viewer exposure at KOP-8 is low. Although visibility toward the project is unrestricted, the project is well into the background distance zone, duration of views will be fairly short as viewers pass this location toward a destination, and the number of viewers is very low.

The visual quality, viewer concern, and viewer exposure combine to result in moderate overall visual sensitivity of KOP-8.

Visual Resources Figure 18

KOP 8 – View from Fossil Bed Road near Black Canyon Road – Pre Project

Visual Resources Figure 19

KOP 8 – View from Fossil Bed Road near Black Canyon Road – Post Project

Visual Resources Figure 19 above is simulation the project site from KOP-8 after project construction. While the project is within view, it is seen at such a distance that it appears indistinct. The photo simulation depicts how little change will occur to the viewshed. Under certain conditions the mirrors could be highly reflective. This might make the project more conspicuous than shown in the simulation.

The visual contrast introduced by the project from KOP-8 will be low due to the project distance. The facilities at the power blocks will cause subtle and visual contrasts in form with the surrounding desert. The extent and continuity of the SCA field will somewhat mimic the horizontal quality of Harper Dry Lake and the flat desert.

Project dominance from KOP-8 will be low. The project will occupy an extensive area, largely covered by structures with a mirrored surface. It will be seen in the background from KOP-8.

View disruption will be low. The project will not disrupt or block views due to the flat topography and the distance of the project from KOP-8.

Based on the noted project-related contrast, dominance and view disruption, the overall visual change to the scene as a result of the project is low at KOP-8.

The evidence shows that although visual sensitivity of KOP-8 is moderate, the visual change resulting from the project will be low. The introduction of the project into the viewshed of KOP 8 will result in a less-than-significant visual impact. (Exs. 1, pp. 5.15-48 - 5.15-49, 301, pp. 5.12-23 - 5.12-24.)

5. Publicly Visible Water Vapor Plumes

The record describes Staff's modeling analysis of the AMS project's cooling tower exhaust stack visible plumes. Visible water vapor plumes from the Applicant's proposed unabated cooling tower design will occur 21.32 percent of seasonal daylight clear hours during the seasonal period (November through April) based on design data and operating parameters provided by the Applicant. (Ex. 301, pp. 5.12-25 – 5.12-26.) Because the predicted water vapor plume frequency will exceed Staff's 20 percent impact criteria threshold, Staff undertook the additional step of calculating plume dimensions.

The plume dimensions from the AMS cooling tower exhaust stacks will be approximately 56 feet high, 70 feet wide, and 27 feet long. (Id.) Since the

proposed exhaust stacks will be 44 feet tall, the effective plume height above the ground will be 100 feet.

The severity of the impacts created by the project's visible water vapor plumes depends on several factors, including the duration, and physical size of the plumes, the sensitivity of the viewers who will see the plumes, the distance between the plumes and the viewers, the visual quality of the existing viewshed, and whether any scenic landscape features will be blocked by the plumes.

Based on the height of the cooling tower exhaust stacks, the predicted 56-foot high plume will appear roughly twice the height of the stacks. The effective plume height above the ground will be 100 feet, which will be about 27 feet higher than the tallest building in the power block complex (73 feet). (Ex. 301, p. 5.12-26.)

Given the open nature of the view from any of the KOPs, the plumes will encompass a narrow portion of the view. The whitish color of the plume and its cloud-like appearance rising into the air will have a moderate to high level of contrast against the predominantly beige and brown backdrop of land, and against the blue sky. The plumes may be seen as contributing to the industrial character of the project. During nighttime hours the plumes will be noticeable but less visually evident than during daylight hours and not contrast as strongly. While there will be ambient light in the power block area, the plumes will be emitted into the sky above the height of the light fixtures.

The evidence shows that the predicted 20th percentile plumes will contribute to the contrast of the facility as a whole, adding a vertical element of light color. In comparison to the vast scale of the mirror fields, however, the 96-foot plumes will not dominate the view but will be visually subordinate to the rest of the facility. At middle-ground distances, the contrast of a plume of this size will remain moderate. At foreground distances, it will contribute further to the already high levels of visual change. The 20th percentile plume will thus not strongly qualitatively change the anticipated levels of impact from various KOPs as described above. (Ex. 301, p. 5.12-26.)

6. Light and Glare

Existing sources of night lighting near the project come from the nearby SEGS VIII and IX facilities and local rural residences and farm operations. Minor sources come from local traffic on Harper Lake Road and Lockhart Road. The remainder of the area is generally undeveloped and primarily dark.

The project lighting system will be designed to provide the minimum illumination needed to achieve safety and security objectives and will be shielded and oriented to focus illumination on the desired areas and minimize additional nighttime illumination in the site vicinity. Thus, the project is anticipated to add a noticeable amount of night lighting, but will not result in a significant effect due to the remote location of the project and very low number of sensitive receptors. (Ex. 301, pp. 5.12-26 - .5.12-29.)

Night lighting for the power block will be designed to be consistent with San Bernardino County Building Code section 83.07.040 regarding Glare and Outdoor Lighting - Mountain and Desert Regions as well as San Bernardino County Ordinance 3900, which addresses light pollution and night sky issues. Implementation of Condition of Certification **VIS-3** will ensure shielding of all project lighting, including construction lighting, and to prevent upward-directed illumination and compliance with San Bernardino County Ordinance 3900. (Ex. 301, p. 5.12-27.)

The primary source of potential glare from the project will be the mirrored surfaces of the SCAs. The bright mirrors and bright spots reflecting off the mirrors are intrusive nuisances and may be a distraction, but generally do not pose a visual hazard except for persons within 60 feet of the plant perimeter fence. Pedestrians within that zone may be exposed to beam intensity levels resulting in epithelial or retinal damage.

In addition, reflective mirror glare at lower, non-hazardous intensity levels has the potential to be an intrusive nuisance or source of discomfort to viewers. **Visual Resources Figure 20** below depicts a typical project reflection at the nearby Kramer Junction SEGS in mid-morning**. Visual Resources Figure 21** below depicts a view of a trough project in Nevada at middle ground distance. When looking toward the mirrors, the bright spots that typically appear are images of the sun. They will be seen by nearby observers on the ground. The bright spots move as one's relationship to the sun changes, in effect following the viewer. Direct observations by Staff of reflected glare from SCAs at the Kramer Junction solar facilities along US-395 support this. (Ex. 301, pp. 5.12-27 - 5.12-28.) At a minimum, the glare observed by Staff was considered a nuisance, and deemed a source of discomfort if directly observed for more than a few moments.

Visual Resources Figure 20
Solar Project Trough Glare Example 1

Visual Resources Figure 21
Solar Project Trough Glare Example 2

Potential exists for motorists on Harper Lake and Lockhart roads to be affected by glare or brightness from the SCA mirrors (most likely to occur when the SCA mirrors are rotated beyond horizontal and especially when rotated to catch morning and afternoon sun). Motorists passing by the solar fields will see a succession of mirrors. Residents looking out east-facing windows or who are outdoors west of the site will have views of the SCAs. They may be subject to the very bright nuisance glare effects observed by Staff at the Kramer Junction facilities. The SCAs will be farther away from the Watchable Wildlife Area than from the noted private residences and local roads. The effects in this area are expected to be no more than a nuisance or distraction.

The Applicant proposes a six to eight-foot high perimeter fence consisting of chain-link material. Visibility of the SCAs essentially will be unobstructed and glare is possible. For nearby residents who could be exposed to high levels of nuisance glare for extended periods in and around their homes, this could represent a potentially significant impact.

In addition, the evidence indicates that the potential level of beam intensity at 60 feet from the east or west plant boundaries may expose pedestrians within that zone to beam intensity levels representing a potential hazard. (Ex. 301, p. 5.12-28.) Condition of Certification **VIS-4**, which requires the Applicant to install 10-foot high slatted fencing in certain areas, is therefore recommended. The height requirement is based on an assumed mirror pedestal height of up to 12 feet, and is intended in part to prevent potential hazardous glare within 60 feet of the plant boundaries during periods of transition between stow and tracking position of the mirror units. The slatted fencing will serve as a reasonable grating to break up direct views of the potentially bright mirrors and thus reduce the effects of glare, including potentially hazardous glare. Condition of Certification **VIS-2** will complement the effectiveness of the fencing, reducing or eliminating exposure to bright glare within and around residents' homes.[48] (Ex. 301, pp. 5.12-26 -5.12-29.)

[48] The recommendation for 10-foot-tall screening under Condition of Certification **VIS-4** will be inconsistent with maximum fence height requirements for renewable projects under County of San Bernardino Development Code Section 84.29.50. However, the County has stated that it would grant a Major Variance for this and similar instances of non-conformance with existing development standards if the project were under County jurisdiction. In addition, Section 83.06.020 states that provisions for fences, hedges and walls do not apply to fences or walls required by a State or Federal agency, or by the County for safety reasons. (Ex. 301, p. 5.12-29.)

7. Cumulative Impact Analysis

Section 15355 of the CEQA Guidelines (Cal. Code Regs., tit. 14) defines a cumulative impact as the result of a combination of projects under consideration together with other existing or reasonably foreseeable projects causing related impacts. Cumulative impacts can result from individually minor but collectively significant impacts taking place over a period or time. The significance of a cumulative visual impact depends on the degree to which the geographic area including the project is visually exposed and (1) the viewshed is altered; (2) views of a scenic resource are impaired; or (3) visual quality is diminished.

The AMS project will be located in a visually remote area of San Bernardino County. Topography and distance are prime factors that determine the project's viewshed. While the valley topography is mostly flat, the surface of the land is undulating and drops slowly in elevation from south to north. Over a distance of several miles these conditions cause the project area to be unseen from SR-58, except for a very short segment east of Harper Lake Road, and for a similarly short distance on U.S. 395 south of Kramer Junction, both at background distances. SR-58 and U.S. 395 are the only places in the general vicinity where there are large numbers of potential viewers. There are no identified scenic resources in the viewsheds of any of the KOPs that provide visibility of the project site.

The project viewshed is comprised mostly of undeveloped western Mojave Desert with a few dispersed dwellings, Harper Dry Lake, some abandoned agricultural fields, and the existing SEGS VIII and IX plant facilities. The SEGS projects occupy a total of just less than 1,000 acres. Several electric power transmission lines traverse the area. The AMS project will convert 1,765 acres of former agricultural fields to solar collection fields and industrial structures. The solar collection fields of the existing SEGS facilities and the proposed AMS project will cover more that 2,500 total acres. Even so, the SCAs form a flat, almost continuous surface that can be visually subordinate from ground level at middle-ground distances.

The BLM received an application for a future solar photovoltaic project in the Harper Lake region in 2007, which will occupy 5,033 acres of federal land adjacent to the Harper Lake ACEC. The two existing solar electric generating projects in combination with the proposed AMS facility and the potential future photovoltaic project will create approximately 7,700 acres (about 12 square miles) of industrial land use on land that was formerly desert or agricultural fields.

Despite the geographic extent, the cumulative visual impacts associated with such a change will be less than significant because the area is visually remote and the industrial character of the combined projects will be seen by a very small number of people. (Ex. 301, p. 5.12-30.)

8. Compliance with Laws, Ordinances, Regulations and Standards (LORS)

With implementation of the Conditions of Certification, the project will comply with applicable LORS. (Ex. 301, pp.5.12-2, 5.12-3, 5.12-30 - 5.12-32.)

FINDINGS OF FACT

Based on the evidence, we find as follows:

1. The AMS project is located in a generally undeveloped portion of the California desert with few adjacent residential uses, and similar facilities within the viewshed.
2. The project area does not possess identified scenic vistas or scenic highways.
3. The AMS project will not substantially degrade the existing visual character or quality of the site and its surroundings.
4. Construction will occur over approximately 24 months.
5. Due to the very low number of potential observers, construction-period activity will result in less-than-significant visual impacts.
6. The primary project components that could affect visual resources include the SCAs, 32 transmission line monopoles, 2 cooling towers and 26 associated buildings.
7. The project's potential impacts on visual resources were analyzed from eight defined KOPs at different locations surrounding the project site and the AMS project will not result in a significant visual impact from any of the KOPs.
8. All AMS project equipment other than the solar arrays will have non-reflective surfaces and a neutral color palette such that glare and visual contrast will be minimized to the greatest extent practicable. This is addressed through project design considerations as well as Condition of Certification **VIS-1**.
9. Although we find that potential impacts will be less than significant, Condition of Certification **VIS-2** will provide relief from permanent views of the project from residences located within one-half mile of the project.
10. Condition of Certification **VIS-3** will ensure that visual impacts due to nighttime lighting will be less than significant.

11. Conditions of Certification **VIS-2** and **VIS-4** ensure that the potential new source of glare from the project SCAs will be kept to a less-than-significant level.
12. The predicted occurrence of visible vapor plumes will contribute to the contrast of the facility as a whole, adding a vertical element of light color. In comparison to the vast scale of the mirror fields, however, plumes will not dominate the view but will be visually subordinate to the rest of the facility.
13. The remoteness of the AMS project and the low number of viewers result in the AMS project neither creating nor contributing to the creation of significant adverse cumulative visual impacts when combined with other industrial projects in the viewshed.

CONCLUSIONS OF LAW

1. Implementation of the following Conditions of Certification will result in the project causing no significant adverse direct, indirect, or cumulative impacts to visual resources.
2. Implementation of the Conditions of Certification, below, will ensure that AMS project complies with all applicable laws, ordinances, regulations, and standards relating to visual resources identified in the pertinent portion of **Appendix A** of this Decision.

CONDITIONS OF CERTIFICATION

SURFACE TREATMENT OF PROJECT STRUCTURES AND BUILDINGS

VIS-1 The project owner shall treat the surfaces of all project structures and buildings visible to the public, other than surfaces that are intended to direct or reflect sunlight, so that their colors minimize visual intrusion and contrast by blending with the rural landscape in both color and value and their colors and finishes do not create excessive glare.

The project owner shall submit to the Compliance Project Manager (CPM) for review and approval a specific surface treatment plan that will satisfy these requirements. The treatment plan shall include:

A. A description of the overall rationale for the proposed surface treatment, including the selection of the proposed color(s) and finishes;

B. A list of each major project structure, building, tank, pipe, wall, and fencing, specifying the color(s) and finish proposed for each. Colors

must be identified by vendor, name, and number or according to a universal designation system;

C. One set of color brochures or color chips showing each proposed color and finish;

D. A specific schedule for completion of the treatment; and

E. A written procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or structures treated in the field, until the project owner receives notification of approval of the treatment plan by the CPM. Subsequent modifications to the treatment plan are prohibited without CPM approval.

Verification: At least 90 days prior to specifying to the vendor the colors and finishes of the first structures or buildings that are surface treated during manufacture, the project owner shall submit the proposed treatment plan to the CPM for review and approval.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a plan with the specified revision(s) for review and approval by the CPM before any treatment is applied. Any modifications to the treatment plan must be submitted to the CPM for review and approval. The review of any subsequent revisions shall be completed by the CPM within 15 days of receipt of the revisions.

Prior to the start of commercial operation, the project owner shall notify the CPM that surface treatment of all listed structures and buildings has been completed and they are ready for inspection and shall submit one set of electronic color photographs from key observation points (KOPs) 1, 2, 3, 4, 5, 6, 7, and 8 analyzed in the Staff Assessment.

The project owner shall provide a status report regarding surface treatment maintenance in the Annual Compliance Report. The report shall specify a): the condition of the surfaces of all structures and buildings at the end of the reporting year; b) maintenance activities that occurred during the reporting year; and c) the schedule of maintenance activities for the next year.

OFF-SITE LANDSCAPE SCREENING

VIS-2 The project owner shall develop and implement a plan to reduce permanent views of the project from residential properties located within 0.5 mile of the project boundary by installing off-site landscape planting on the residential properties if the landowner so desires and requests implementation of the off-site landscape screening in writing.

The landscape planting shall reduce views of the project and exposure to glare to a reasonable level. The landscape planting shall only include drought-resistant plants that reduce views of the project and exposure to glare to a reasonable level.

The project owner shall submit to the CPM for review and approval a screening plan providing proper implementation that will satisfy these requirements. The plan shall include:

A. A detailed plan at a reasonable scale such that all information is legible, and elevations and/or section drawings showing the relationship of the screening to the project site. The plan, elevations and/or sections shall clearly demonstrate how the view-reducing reducing requirements stated above shall be met. The plan shall provide a detailed plant list including quantities and sizes of materials to be used and an installation schedule demonstrating installation of as much of the screening as early in the construction process as is feasible in coordination with project construction; Landscaping shall include native species that are drought tolerant and do not modify or provide a habitat for predator species such as ravens;

B. A watering plan for the drought-resistant vegetative planting that includes methods such as drip irrigation.

C. Plant establishment procedures, including a plan for routine care and monitoring of plant materials will be provided by the project owner to each landowner. The project owner will work with landowners to ensure proper and diligent watering, weeding, and maintenance. The project owner will replace plants that fail to thrive for a period of five years from installation;

D. Documentation that a landowner declines to have landscape screening installed on his property in the event they choose not to participate in the screening program.

E. The plan shall not be implemented until the project owner receives final approval from the CPM.

Verification: The screening plan shall be submitted to the CPM for review and approval at least 90 days prior to installation.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a revised plan for review and approval by the CPM. The review of any subsequent revisions shall be completed by the CPM within 15 days of receipt of the revisions.

The project owner shall notify the CPM within seven days after completing the screening installation that the screening is ready for inspection.

The project owner shall report maintenance activities, including replacement of plants that fail to thrive for the previous year of operation for a period of five years, in each Annual Compliance Report.

TEMPORARY AND PERMANENT EXTERIOR LIGHTING

VIS-3 To the extent feasible and consistent with safety and security considerations, the project owner shall design and install all temporary and permanent exterior lighting so that:

a) lighting does not cause excessive reflected glare;

b) lighting does not illuminate the nighttime sky;

c) illumination of the project and its immediate vicinity is minimized as to times of use and extent, and;

d) lighting on the exhaust stacks shall be the minimum needed to satisfy safety and security concerns.

Permanent night lighting shall comply with all applicable standards, practices, and regulations including, and specifically, the following Illuminating Engineering Society documents:

- RP-33-99 Lighting for Exterior Environments
- DG-13-99 Outdoor Lighting
- TM-10-00 Addressing Obtrusive Light (Urban Sky Glow and Light Trespass) in Conjunction with Roadway Lighting
- TM-15-07 Luminaire Classification System for Outdoor Luminaires

Verification: At least 90 days prior to ordering any exterior lighting, the project owner shall contact the CPM to show compliance with all of the above requirements. This shall include, but not be limited to, final lighting plans, fixture and control schedules, fixture and control cut sheets and specifications, a photometric plan showing vertical and horizontal footcandles at all property lines to a height of 20 feet, and the proposed time clock schedule.

Prior to construction and prior to commercial operation, the project owner shall notify the CPM that the installation of the temporary and permanent lighting has been completed and is ready for inspection. If after inspection the CPM notifies the project owner that modifications to the lighting are needed, within 30 days after receiving the notification the project owner shall implement the modifications and notify the CPM when the modifications are competed and ready for inspection.

Within 48 hours of receiving a lighting complaint, the project owner shall provide the CPM with a complaint resolution form as specified in the Compliance General

Conditions, including a proposal to resolve the complaint, and a schedule for implementation of the proposed resolution. The project owner shall notify the CPM within 48 hours after completing the resolution of the complaint. A copy of the complaint resolution form report shall be submitted to the CPM within 30 days and included in the Annual Report.

PERIMETER SCREENING

VIS-4 The project owner shall develop and implement a screening plan that reduces direct visibility of the SCA mirrors to traffic on Harper Lake Road north of Lockhart Road, to traffic on Lockhart Road from Harper Lake Road to the eastern boundary of the Beta solar field, to residents living within one mile of the west boundary of the Beta solar field, and to visitors of the Harper Dry Lake Watchable Wildlife Area. The plan shall utilize sufficient setbacks of the SCAs from roads and 10-foot high slatted fencing to eliminate public exposure to hazardous levels of reflection, and to minimize public exposure to nuisance glare. The screening shall be designed to minimize glare from the project as seen by motorists and local residents during all times of year and periods of the day. Fence slats shall be of a non-reflective tan or other color designed to blend with the visual background in order to minimize color contrast of the fence.

The project owner shall submit to the CPM for review and approval a screening plan providing proper implementation that will satisfy these requirements. The plan shall include:

A. A detailed plan at a reasonable scale such that all information is legible, and elevations and/or section drawings showing the relationship of the screening to the road and SCAs from locations on Lockhart Road. The plan, elevations and/or sections shall clearly demonstrate how the glare-reducing requirements stated above shall be met. The plan shall provide a detailed installation schedule demonstrating installation of as much of the screening as early in the construction process as is feasible in coordination with project construction;

B. Maintenance procedures, including a plan for routine annual or semi-annual debris removal and repair of slatted fencing for the life of the project;

C. A procedure for monitoring and replacement of damaged screening for the life of the project; and

D. The plan shall not be implemented until the project owner receives final approval from the CPM.

Verification: The screening plan shall be submitted to the CPM for review and approval at least 90 days prior to installation.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a revised plan for review and approval by the CPM. The review of any subsequent revisions shall be completed by the CPM within 15 days of receipt of the revisions.

The project owner shall notify the CPM within seven days after completing the screening installation that the screening is ready for inspection.

The project owner shall report maintenance activities, including replacement of damaged or destroyed screening for the previous year of operation in each Annual Compliance Report.

Appendix A: *Laws, Ordinances, Regulations, and Standards*

Appendix B: *Exhibit List*

Appendix C: *Proof of Service List*

APPENDICES

AIR QUALITY

Applicable LORS	*Description*
Federal	
40 Code of Federal Regulations (CFR) Part 52	Nonattainment New Source Review (NSR) requires a permit and requires Best Available Control Technology (BACT) and Offsets. Permitting and enforcement delegated to MDAQMD. Prevention of Significant Deterioration (PSD) requires major sources or major modifications to major sources to obtain permits for attainment pollutants. AMS is a new source that does not have a rule listed emission source thus the PSD trigger levels are 250 tons per year for NOx, VOC, SO_2, PM2.5 and CO.
40 CFR Part 60	New Source Performance Standards (NSPS), Subpart Dc Standards of Performance for Small Industrial-Commercial-Institutional Steam Generation Units. Establishes recordkeeping and reporting requirements for natural gas fired steam generating units. Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. Establishes emission standards for compressions ignition internal combustion engines, including emergency generator and fire water pump engines.
40 CFR Part 93 General Conformity	Requires determination of conformity with State Implementation Plan for Projects requiring federal approvals if project annual emissions are above specified levels.
State	
Health and Safety Code (HSC) Section 40910-40930	Permitting of source needs to be consistent with Air Resource Board (ARB) approved Clean Air Plans.
HSC Section 41700	Restricts emissions that would cause nuisance or injury.
California Code of Regulations (CCR) Section 93115	Airborne Toxics Control Measure for Stationary Compression Ignition Engines. Limits the types of fuels allowed, established maximum emission rates, establishes recordkeeping requirements on stationary compression ignition engines, including emergency generator and fire water pump engines.
Local (Mojave Desert Air Quality Management District)	
Rule 201 and 203 Permits Required	Requires a Permit to Construct before construction of an emission source occurs. Prohibits operation of any equipment that emits or controls air pollutant without first obtaining a permit to operate.

Applicable LORS	***Description***
Rules 401, 402, and 403 Nuisance, Visible Emissions, Fugitive Dust	Limits the visible, nuisance, and fugitive dust emissions and would be applicable to the construction period of the project.
Rule 403.2 Fugitive Dust Control for the Mojave Desert Planning Area	Limits fugitive dust emissions within the Mojave Desert Planning Area. Rule 403.2 supersedes Rule 403 if there are any conflicting requirements. This rule would be applicable to the construction period of the project.
Rule 404 Particulate Matter - Concentration	Limits the particulate matter concentration from stationary source exhausts.
Rule 406 Specific Contaminants	The rule prohibits sulfur compound emissions in excess of 500 ppmv.
Rule 407 Liquid and Gaseous Air Contaminants	The rule prohibits carbon monoxide emissions in excess of 2,000 ppmv.
Rule 409 Combustion Contaminants	Limits the emissions from fossil fuel combustion.
Rule 431 Sulfur Content of Fuels	Limits the sulfur content of liquid fuels to no more than 0.5% by weight.
Rule 461 Gasoline Transfer and Dispensing	This rule specifies the vapor recovery requirement for gasoline tank filling (Phase I) and vehicle refueling (Phase II) for gasoline storage and refueling facilities.
Rule 900 Standard of Performance for New Stationary Source	Incorporates the Federal NSPS (40 CFR 60) rules by reference.
Rule 1303 New Source Review	Specifies BACT/Offsets technology and requirements for a new emissions unit that has potential to emit any regulated pollutants.
Rule 1306 Electric Energy Generating Facilities	Describes actions to be taken for permitting of power plants that are within the jurisdiction of the Energy Commission.

GREENHOUSE GAS

Applicable LORS	*Description*
Federal	
40 Code of Federal Regulations (CFR) Part 98	This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO_2 equivalent emissions per year.
State	
California Global Warming Solutions Act of 2006, AB 32 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)	This act requires the California Air Resource Board (ARB) to enact standards that will reduce GHG emission to 1990 levels by 2020. Electricity production facilities will be regulated by the ARB.
California Code of Regulations, tit. 17, Subchapter 10, Article 2, sections 95100 et. seq.	These ARB regulations implement mandatory GHG emissions reporting as part of the California Global Warming Solutions Act of 2006 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)
Title 20, California Code of Regulations, section 2900 et seq.; CPUC Decision D0701039 in proceeding R0604009	The regulations prohibit utilities from entering into long-term contracts with any base load facility that does not meet a greenhouse gas emission standard of 0.5 metric tonnes carbon dioxide per megawatt-hour (0.5 $MTCO_2$/MWh) or 1,100 pounds carbon dioxide per megawatt-hour (1,100 lbs CO_2/MWh).

ALTERNATIVES

California Environmental Quality Act (CEQA)

Energy Commission staff is required by agency regulations to examine the "feasibility of available site and facility alternatives to the Applicant's proposal which substantially lessen the significant adverse impacts of the proposal on the environment." (Cal. Code Regs., tit. 20, § 1765.)

The "Guidelines for Implementation of the California Environmental Quality Act," Title 14, California Code of Regulations, Section 15126.6(a), requires an evaluation of the comparative merits of "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project."

In addition, the analysis must address the No Project Alternative. (Cal. Code Regs., tit. 14, § 15126.6[e].) The analysis should identify and compare the impacts of the various alternatives, but analysis of alternatives need not be in as much detail as the analysis of the proposed project.

The range of alternatives is governed by the "rule of reason," which requires consideration only of those alternatives necessary to permit informed decision making and public participation. CEQA states that an environmental document does not have to consider an alternative if its effect cannot be reasonably ascertained and if its implementation is remote and speculative. (Cal. Code Regs., tit. 14, §15126.6[f][3].) However, if the range of alternatives is defined too narrowly, the analysis may be inadequate (*City of Santee v. County of San Diego* [4th District, 1989] 214 Cal. App. 3d 1438).

BIOLOGICAL RESOURCES

Applicable LORS	*Description*
Federal	
Endangered Species Act (Title 16, United States Code, sections 1531 et seq.; Title 50, Code of Federal Regulations, part 17.1 et seq.)	Designates and provides for the protection of threatened and endangered plant and animal species and their critical habitat. The administering agency is U.S. Fish and Wildlife Service (USFWS).
Clean Water Act of 1977 (Title 33, United States Code, sections 1251–1376, and Code of Federal Regulations, part 30, Section 330.5(a)(26))	Prohibits the discharge of dredged or fill material into the waters of the United States without a permit. The administering agency is the U.S. Army Corps of Engineers (USACE).
Bald and Golden Eagle Protection Act (Title 16, United States Code, sections 668-668c)	Prohibits the take or trade of bald and golden eagles (or any part, nest or egg of such bird). September 2009 Final Rule provides for a regulatory mechanism under the Act to permit take of bald or golden eagles comparable to incidental take permits under the Endangered Species Act. The administering agency is USFWS.
Migratory Bird Treaty Act (Title 16, United States Code, sections 703–711)	Prohibits the take or possession of any migratory nongame bird (or any part of such migratory nongame bird), including nests with viable eggs. The administering agency is USFWS.
California Desert Conservation Area (CDCA) Plan	Establishes goals for protection and use of the Desert, designates distinct multiple use classes for covered areas, and establishes a framework for managing the resources within these classes. The Plan covers 25 million acres in southern California; approximately 10 million of these acres are administered by the BLM. Management goals include establishing Areas of Critical Environmental Concern (ACEC). The proposed project area is located within the CDCA adjacent to the Harper Dry Lake ACEC.
West Mojave Plan	Provides management strategies for conservation of desert tortoise, Mohave ground squirrel, and over 100 other sensitive plants and animals throughout the western Mojave Desert, while establishing a streamlined program for compliance with the regulatory requirements of the federal and California endangered species acts for projects on BLM land. The West Mojave Plan is an amendment to the CDCA Plan. The administering agency is BLM. The proposed project area is located within the West Mojave Plan area.
State	
California Endangered Species Act (Fish and Game Code, sections 2050 et seq.)	Protects California's rare, threatened, and endangered species. The administering agency is CDFG.
California Code of Regulations (Title 14,	Lists the plants and animals that are classified as rare, threatened, or endangered in California. The administering agency is CDFG.

Applicable LORS	Description
sections 670.2 and 670.5)	
California Code of Regulations (Title 14, sections 460)	Provides information regarding the protection and take of furbearing mammals. This regulation makes it unlawful to take fisher, marten, river otter, desert kit fox and red fox. The administering agency is CDFG.
California Code of Regulations (Title 20, sections 1702(q) and (v))	Protects “areas of critical concern” and “species of special concern” identified by local, state, or federal resource agencies within the project area. The administering agencies are USFWS and CDFG.
Fully Protected Species (Fish and Game Code, sections 3511, 4700, 5050, and 5515)	Designates certain species as fully protected and prohibits take of such species. The administering agency is CDFG.
Native Plant Protection Act (Fish and Game Code, section 1900 et seq.)	Designates rare, threatened, and endangered plants in California and prohibits the taking of listed plants. The administering agency is CDFG.
Nest or Eggs (Fish and Game Code, section 3503)	Prohibits take, possession, or needless destruction of the nest or eggs of any bird. The administering agency is CDFG.
Birds of Prey (Fish and Game Code, section 3503.5)	Specifically protects California’s birds of prey in the orders Falconiformes and Strigiformes by making it unlawful to take, possess, or destroy any such birds of prey or to take, possess, or destroy the nest or eggs of any such bird. The administering agency is CDFG.
Migratory Birds (Fish and Game Code, section 3513)	Prohibits take or possession of any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird. The administering agency is CDFG.
Public Resources Code, sections 25500 and 25527	Prohibits siting of facilities in certain areas of critical concern for biological resource, such as ecological preserves, refuges, etc. The administering agency is the Energy Commission (with comment from CDFG).
Fish and Game Code, sections 4150	Prohibits the take or possession of any nongame mammal or parts thereof except as provided in the Fish and Game Code or in accordance with regulations adopted by the commission. The administering agency is CDFG.
California Desert Native Plants Act (CDNPA) (Food and Agricultural Code, sections 80001 et seq. and California Fish and Game Code sections 1925-1926)	Protects non-listed California desert native plants from unlawful harvesting on both public and private lands in certain counties, unless a permit is secured from the Agricultural Commissioner or the sheriff in the county for which the action is to take place. Administering agency is CDFG and Department of Food and Agriculture.
The Porter-Cologne Water Quality Control Act (Porter-Cologne; Public Resource Code, sections 13000 et seq.)	Regulates discharges of waste and fill material to waters of the state, including “isolated” waters and wetlands. The administering agency is Regional Water Quality Control Board.

Applicable LORS	***Description***
Lake and Streambed Alteration (Fish and Game Code, sections 1600 et seq.)	Requires notification to CDFG prior to any activity that may result in substantial modification of the natural flow, or alteration of the bed, or bank, of any river, stream, or lake that supports fish or wildlife resources. The administering agency is CDFG.
Local	
San Bernardino County General Plan, Land Use/Conservation/Open Space Element (2004)	Implements programs that maintain and enhance biological diversity and healthy ecosystems throughout San Bernardino County by ensuring that proposed development projects demonstrate a high degree of compatibility with sensitive biological resources and that coordination with state and federal agencies is exercised so that protection of biological resources parallels the goals of those agencies.
Plant Protection and Management (San Bernardino County Development Code, sections 89.0101 et seq.)	Promotes the continued health of plant resources by providing regulations and guidelines that assist with management of plant resources in the unincorporated areas of San Bernardino County on property or combinations of property under private or public ownership.

CULTURAL RESOURCES

Applicable LORS	*Description*
State	
Public Resources Code, section 21083.2 (CEQA)	The lead agency may require reasonable steps to preserve a unique archaeological resource in place. Otherwise, the project applicant is required to fund mitigation measures to the extent prescribed in this section. This section also allows a lead agency to make provisions for archaeological resources unexpectedly encountered during construction, which may require the project applicant to fund mitigation and delay construction in the area of the find.
Health and Safety Code, section 7050.5	Makes it a misdemeanor to disturb or remove human remains found outside a cemetery; also requires a project owner to halt construction if human remains are discovered and to contact the county coroner.
Public Resources Code 5097.98 (b) and (e)	Requires a landowner on whose property Native American human remains are found to limit further development activity in the vicinity until he/she confers with the Native American Heritage Commission's(NAHC)-identified Most Likely Descendents (MLDs) to consider treatment options. In the absence of MLDs or of a treatment acceptable to all parties, the landowner is required to reinter the remains elsewhere on the property in a location not subject to further disturbance.
Local	
San Bernardino County General Plan, Section V.4-Conservation Element	Provides that the County will preserve and promote its historic and prehistoric cultural heritage.

FACILITY DESIGN

Applicable LORS	*Description*
Federal	Title 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health standards
State	2007 (or the latest edition in effect) California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations)
Local	San Bernardino County regulations and ordinances
General	American National Standards Institute (ANSI) American Society of Mechanical Engineers (ASME) American Welding Society (AWS) American Society for Testing and Materials (ASTM)

GEOLOGY AND PALEONTOLOGY

Applicable LORS	***Description***
Federal	
Antiquities Act of 1906 (16 United States Code [USC], 431-433)	The proposed AMS facility site is located entirely on private land. Although there is no specific mention of natural or paleontological resources in the Act itself, or in the Act's uniform rules and regulations (Title 43 Part 3, Code of Federal Regulations [43 CFR Part 3], 'objects of antiquity' has been interpreted to include fossils by the Federal Highways Act of 1956, the National Park Service (NPS), the Bureau of Land Management (BLM), the Forest Service (USFS), and other Federal agencies.
State	
California Building Code (CBC), 2007	The CBC (2007) includes a series of standards that are used in project investigation, design, and construction (including grading and erosion control).
Alquist-Priolo Earthquake Fault Zoning Act, Public Resources Code (PRC), Section 2621–2630	Mitigates against surface fault rupture of known active faults beneath occupied structures. Requires disclosure to potential buyers of existing real estate and a 50-foot setback for new occupied buildings. Portions of the site and proposed ancillary facilities are located within designated Alquist-Priolo Earthquake Fault Zones. The proposed site layout places occupied structures outside of the 50-foot setback zone.
The Seismic Hazards Mapping Act, PRC Section 2690–2699	Areas are identified that are subject to the effects of strong ground shaking, such as liquefaction, landslides, tsunamis, and seiches.
PRC, Chapter 1.7, Sections 5097.5 and 30244	Regulates removal of paleontological resources from state lands, defines unauthorized removal of fossil resources as a misdemeanor, and requires mitigation of disturbed sites.
Warren-Alquist Act, PRC, Sections 25527 and 25550.5(i)	The Warren-Alquist Act requires the Energy Commission to "give the greatest consideration to the need for protecting areas of critical environmental concern, including, but not limited to, unique and irreplaceable scientific, scenic, and educational wildlife habitats; unique historical, archaeological, and cultural sites…" With respect to paleontologic resources, the Energy Commission relies on guidelines from the Society for Vertebrate Paleontology, indicated below.
California Environmental Quality Act (CEQA), PRC sections 15000 et seq., Appendix G	Mandates that public and private entities identify the potential impacts on the environment during proposed activities. Appendix G outlines the requirements for compliance with CEQA and provides a definition of significant impacts on a fossil site.

Applicable LORS	***Description***
Society for Vertebrate Paleontology (SVP), 1995	The “Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontological Resources: Standard Procedures” is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. The measures were adopted in October 1995 by the SVP, a national organization of professional scientists.
Local	
San Bernardino County 2007 Development Code, Chapters 82.15, 82.20 and Safety Element	Chapter 82.15 requires that a geological study will be undertaken where roads and structures are to be constructed. Also requires that roads and utilities will be perpendicular to faults. Chapter 82.20 defines criteria for site evaluation for paleontological resources in the county, including preliminary field surveys, monitoring during construction, and specimen recovery; also defines qualifications for professional paleontologists. The Safety Element requires compliance with geological/geotechnical reports, the CBC, and other state agencies and regulations.

HAZARDOUS MATERIALS MANAGEMENT

Applicable LORS	***Description***
Federal	
The Superfund Amendments and Reauthorization Act of 1986 (42 USC §9601 et seq.)	Contains the Emergency Planning and Community Right To Know Act (also known as SARA Title III).
The Clean Air Act (CAA) of 1990 (42 USC 7401 et seq. as amended)	Established a nationwide emergency planning and response program and imposed reporting requirements for businesses that store, handle, or produce significant quantities of extremely hazardous materials.
The CAA section on risk management plans (42 USC §112(r)	Requires states to implement a comprehensive system informing local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of both SARA Title III and the CAA are reflected in the California Health and Safety Code, section 25531, et seq.
49 CFR 172.800	The U.S. Department of Transportation (DOT) requirement that suppliers of hazardous materials prepare and implement security plans.
49 CFR Part 1572, Subparts A and B	Requires suppliers of hazardous materials to ensure that all their hazardous materials drivers are in compliance with personnel background security checks.
The Clean Water Act (CWA) (40 CFR 112)	Aims to prevent the discharge or threat of discharge of oil into navigable waters or adjoining shorelines. Requires a written spill prevention, control, and countermeasures (SPCC) plan to be prepared for facilities that store oil that could leak into navigable waters.
Federal Register (6 CFR Part 27) interim final rule	A regulation of the U.S. Department of Homeland Security that requires facilities that use or store certain hazardous materials to submit information to the department so that a vulnerability assessment can be conducted to determine what certain specified security measures shall be implemented.
State	
Title 8, California Code of Regulations, section 5189	Requires facility owners to develop and implement effective safety management plans that ensure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the Risk Management Plan (RMP) process.

Applicable LORS	***Description***
California Health and Safety Code, section 41700	Requires that "No person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property."
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)	Prevents certain chemicals that cause cancer and reproductive toxicity from being discharged into sources of drinking water.
Hazardous Material Business Plan, Cal HSC Sections 25500 to 25541; 19 CCR Sections 2720 to 2734	Requires the submittal of a chemical inventory and planning and reporting for management of hazardous materials.
Hazardous Substance Information and Training Act, 8 CCR Section 339; Section 3200 et seq., 5139 et seq., and 5160 et seq.	Requires listing and implementation of specified control measures for management of hazardous substances.
California HSC Sections 25270 through 25270.13	Requires the preparation of a Spill Prevention, Control, and Countermeasures (SPCC) Plan if 10,000 gallons or more of petroleum is stored on-site. The above regulations would also require the immediate reporting of a spill or release of 42 gallons or more to the California Office of Emergency Services and the Certified Unified Program Authority (CUPA).
Process Safety Management: Title 8 CCR Section 5189	Requires facility owners to develop and implement effective process safety management plans when toxic, reactive, flammable, or explosive chemicals are maintained on site in quantities that exceed regulatory thresholds.
Local	
2007 California Fire Code Title 24, Part 9	Adopts the California Fire Code, 2007 Edition, into San Bernardino County regulations.

LAND USE

Applicable LORS	*Description*
Federal	None
State	
Subdivision Map Act (Public Resources Code Section 66410-66499.58)	This section of the California Public Resources Code provides procedures and requirements regulating land division (subdivisions) and parcel legality. Regulation and control of the design and improvement of subdivisions have been vested in the legislative bodies of local agencies.
Local	
County of San Bernardino 2007 General Plan (SBC 2007a)	The policies and programs of the County of San Bernardino General Plan, adopted March 13, 2007, are intended to serve as a blueprint for most land use decisions. Preparing, adopting, implementing, and maintaining a general plan serves to: identify the community's land use, transportation, environmental, economic, and social goals and policies as they relate to land use and development; form the basis for local government decision-making, including decisions on proposed development; provide residents with opportunities to participate in the planning and decision-making processes of their community; and inform residents, developers, decision makers, and other cities and counties of the ground rules that guide development within the community.
County of San Bernardino 2007 Development Code, Title 8 of the San Bernardino County Code (CSB 2007b; CSB 2010d)	The County's Development Code was adopted March 13, 2007, and amended August 20, 2009 and February 2010. The purpose of this Development Code is to implement the San Bernardino County General Plan by classifying and regulating the uses of land and structures within unincorporated San Bernardino County. In particular, the purposes of the Development Code are as follows: to provide standards and guidelines for continuing orderly growth and development; to conserve and protect the County's important agriculture, cultural, natural, open space and scenic resources; to create a comprehensive and stable pattern of land uses upon which to plan transportation, water supply, sewerage, energy, drainage/flood control and other public facilities and utilities; to encourage the most appropriate uses of land in order to prevent overcrowding of land and avoid undue concentration of population, and maintain and protect the value of property; and to ensure compatibility between different types of development and land use. The Development Code was most recently amended on February 9, 2010, to include Chapter 84.29 (Renewable Energy Generation Facilities) for the purpose of establishing "...standards and permit procedures for the establishment, maintenance and decommissioning of renewable energy generation facilities" (CSB 2010d).

NOISE AND VIBRATION

Applicable LORS	*Description*
Federal	
Occupational Safety & Health Act (OSHA): 29 U.S.C. § 651 et seq.	Protects workers from the effects of occupational noise exposure
U.S. Environmental Protection Agency (USEPA)	Assists state and local government entities in development of state and local LORS for noise
State	
California Occupational Safety & Health Act (Cal-OSHA): 29 U.S.C. § 651 et seq., Cal. Code Regs., tit. 8, §§ 5095-5099	Protects workers from the effects of occupational noise exposure
Local	
County of San Bernardino Noise Development Code, §§ 83.01.080, 83.01.090	Limits project noise levels at noise-sensitive receptors. Limits hours of construction.

POWER PLANT EFFICIENCY

No federal, state, local, or county laws, ordinances, regulations and standards (LORS) apply to the efficiency of this project.

POWER PLANT RELIABILITY

No federal, state, local, or county laws, ordinances, regulations and standards (LORS) pertain to the reliability of this project.

PUBLIC HEALTH

Applicable LORS	*Description*
Federal	
Clean Air Act section 112 (42 U.S. Code section 7412)	Requires new sources which emit more than ten tons per year of any specified hazardous air pollutant (HAP) or more than 25 tons per year of any combination of HAPs to apply Maximum Achievable Control Technology (MACT).
State	
California Health and Safety Code 25249.5 et seq. (Proposition 65)	Establishes thresholds of exposure to carcinogenic substances above which Prop 65 exposure warnings are required.
California Health and Safety Code section 41700	This section states that “no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”
California Health and Safety Code Sections 44300 et seq.	Air Toxics Hot Spots Program requires participation in the inventory and reporting program at the District level.
California Health and Safety Code Sections 44360 - 44366	Air Toxics Hot Spots Information and Assessment Act requires that based on results of an HRA conducted per CARB/OEHHA guidelines, toxic contaminants do not exceed acceptable levels.
California Public Resource Code Section 25523(a); Title 20 CCR Section 1752.5, 2300-2309; and Division 2 Chapter 5, Article 1, Appendix B, Part (1); California Clean Air Act, H&SC section 39650, et seq.	These regulations require a quantitative health risk assessment for new or modified sources, including power plants that emit one or more toxic air contaminants.
Local	
Mojave Desert Air Quality Management District Rule 1320	Requires the use of BACT and T-BACT at certain projects and the preparation of an HRA.

SOCIOECONOMICS

Applicable LORS	*Description*
State	
California Education Code, Section 17620	The governing board of any school district is authorized to levy a fee, charge, dedication, or other requirement for the purpose of funding the construction or reconstruction of school facilities.
California Government Code, Sections 65996-65997	Except for a fee, charge, dedication, or other requirement authorized under Section 17620 of the Education Code, state and local public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities.
Local	**None**

SOIL & WATER RESOURCES

Applicable LORs	***Description***
Federal LORS	
Clean Water Act (33 USC Section 1257 et seq.)	The Clean Water Act (CWA) (33 USC § 1257 et seq.) requires states to set standards to protect water quality, which includes regulation of storm water and wastewater discharges during construction and operation of a facility. California established its regulations to comply with the CWA under the Porter-Cologne Water Quality Control Act of 1967. The CWA also establishes protection of navigable waters. Activities that result in the dredging or filling of jurisdictional waters of the United States require authorization under a Section 404 permit issued by the Army Corps of Engineers (USACE). The USACE may grant authorization under either an individual permit or a nationwide permit to address operations that may affect the ephemeral washes. Section 404 permits are also subject to CWA Section 401 water quality certification through the Regional Water Quality Control Board (RWQCB). Section 401 certification through the RWQCB is required if there are potential impacts to surface waters of the State and/or Waters of the United States, such as perennial and ephemeral drainages, streams, washes, ponds, pools, and wetlands. The RWQCB can require impacts to these waters to be quantified and mitigated.
Resource Conservation and Recovery Act, 42 USC 6901 *et seq.*; 40 CFR Part 260 et seq.	The Resource Conservation Recovery Act (RCRA) is a comprehensive body of regulations that give U.S. EPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also sets forth a framework for the management of non-hazardous solid wastes.
State LORS	
California Constitution, Article 10, Section 2	This section requires that the water resources of the State be put to beneficial use to the fullest extent possible and states that the waste, unreasonable use, or unreasonable method of use of water is prohibited.
The Porter-Cologne Water Quality Control Act of 1967, Water Code Sec 13000 et seq.	Requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. Those regulations require that the RWQCBs issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable. Section 13000 also states that the State must be prepared to exercise its full power and jurisdiction to protect the quality of the waters of the State from degradation.

Applicable LORs	***Description***
California Water Code Section 13050	Defines “waters of the State.”
California Water Code Section 13240, 13241, 13242, 13243, & Water Quality Control Plan for the Lahontan Region (Basin Plan)	The Basin Plan establishes water quality objectives that protect the beneficial uses of surface water and groundwater in the Region. The Basin Plan describes implementation plans and other control measures designed to ensure compliance with statewide plans and policies and provides comprehensive water quality planning. The following chapters are applicable to determining appropriate control measures and cleanup levels to protect beneficial uses and to meet the water quality objectives: Chapter 2, Present and Potential Beneficial Uses; Chapter 3, Water Quality Objectives, and the sections of Chapter 4, Implementation, entitled “Requirements for Site Investigation and Remediation,” “Cleanup Levels,” “Risk Assessment,” “Stormwater Problems and Control Measures,” Erosion and Sedimentation,” “Solid and Liquid Waste Disposal to Land,” and “Groundwater Protection and Management.”
California Water Code Section 13260	Requires filing, with the appropriate RWQCB, a report of waste discharge that could affect the water quality of the state unless the requirement is waived pursuant to Water Code section 13269.
California Code of Regulations, Title 23, Division 3, Chapter 30	This chapter requires the submission of analytical test results and other monitoring information electronically over the internet to the SWRCB’s Geotracker database.
State Water Resources Control Board General Permit CAS000002.	The SWRCB regulates storm water discharges associated with construction projects affecting areas greater than or equal to 1 acre to protect state waters. Under General Permit CAS000002, the SWRCB has issued a National Pollutant Discharge Elimination System (NPDES) General Permit for storm water discharges associated with construction activity. Projects can qualify under this permit if specific criteria are met and an acceptable Storm Water Pollution Prevention Plan (SWPPP) is prepared and implemented after notifying the SWRCB with a Notice of Intent.
State Water Resources Control Board 2003-003-DWQ	This general permit applies to the discharge of water to land that has a low threat to water quality. Categories of low threat discharges include piping hydrostatic test water.
California Code of Regulations, Title 22	Title 22, Division 4, Chapter 15 specifies Primary and Secondary Drinking Water Standards in terms of Maximum Contaminant Levels (MCLs). These MCLs include total dissolved solids (TDS) ranging from a recommended level of 500 milligrams per liter (mg/l), an upper level of 1,000 mg/l and a short term level of 1,500 mg/l. Other water quality MCLs are also specified, in addition to MCLS specified for heavy metals and chemical compounds.

Applicable LORs	***Description***
California Code of Regulations, Title 23	Title 23, Division 3, Chapter 15 applies to waste discharges to land and requires the Regional Board issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable.
Warren-Alquist Act, Section 25008	Requires that the Commission promote “all feasible means” of water conservation and “all feasible uses” of alternative water supply sources.
The California Safe Drinking Water and Toxic Enforcement Act	The California Health & Safety Code Section 25249.5 et seq. prohibits actions contaminating drinking water with chemicals known to cause cancer or possessing reproductive toxicity. The RWQCB administers the requirements of the Act.
Local	
Mojave River Basin Adjudication	The Mojave River Basin water rights adjudication has divided the basin into subareas with the Mojave Water Agency as the Watermaster and administer of the judgment. The adjudication’s physical solution is to balance long-term supply and demand with any deficit accounted for by the purchase and recharge of supplemental water. In addition, the adjudication specifically states that no party to the judgment is relieved of their responsibility to comply with state or federal water quality protection laws or any permits, standards, requirements, or orders intended to protect water quality. The adjudication also states there is a need to conserve water and make the maximum beneficial use of the water resources in the State
County of San Bernardino General Plan and Development Code	Grading in San Bernardino County is subject to terms and conditions of San Bernardino County’s General Plan, Development Code and California Building Code, based upon the 2006 International Building Code. If a county grading permit is required, the grading plan would need to be completed in compliance with San Bernardino County’s General Plan and Development Code.
California Safe Drinking Water Act and San Bernardino County Code Title 3, Division 3, Chapter 6, Public Water Supply Systems	Requires public water systems to obtain a Domestic Water Supply Permit. The California Safe Drinking Water Act requires public water systems to obtain a Domestic Water Supply Permit. Public water systems are defined as a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out the year. California Department of Public Health (CDPH) administers the Domestic Water Supply Permit program, and has delegated issuance of Domestic Water Supply Permits for smaller public water systems in San Bernardino County to the County. Under the San Bernardino County Code Title 3, 5.15-6 Division 3, Chapter 6, Public Water Supply Systems, the County Department of Environmental Services monitors and enforces all applicable laws and orders

Applicable LORs	*Description*
	for public water systems with less than 200 service connections. The proposed project would likely be considered a non-transient, non-community water system.
San Bernardino County Development Code Section 82.13.080, Soil Erosion and Sediment Control Plans/Permits	Section 82.13.080 establishes regulations and procedures to control human existing and potential induced accelerated erosion. Elements of this ordinance include project planning, preparation of Soil Erosion and Sediment Control Plans, runoff control, land clearing, and winter operations.
San Bernardino County Ordinance Code, Title 3, Division 3, Chapter 8, Waste Management, Article 5, Liquid Waste Disposal	This ordinance requires the following compliance for all liquid waste disposal systems: (1) compliance with applicable portions of the Uniform Plumbing Code and the San Bernardino County Department of Environmental Health (DEHS) standards; (2) approval by the DEHS and building authority with jurisdiction over the system; or (3) for alternative systems, approval by the DEHS, the appropriate building official of this jurisdiction, and the appropriate California RWQCB.
San Bernardino County Ordinance Code, Title 6, Division 3, Chapter 3, Uniform Plumbing Code	This ordinance describes the installation and inspection requirements for locating disposal/leach fields and seepage pits.
State Policies and Guidance	
Integrated Energy Policy Report (Public Resources Code, Div. 15, Section 25300 et seq.)	In the 2003 Integrated Energy Policy Report (IEPR), consistent with SWRCB Policy 75-58 and the Warren-Alquist Act, the Energy Commission adopted a policy stating they will approve the use of fresh water for cooling purposes by power plants only where alternative water supply sources and alternative cooling technologies are shown to be “environmentally undesirable” or “economically unsound.”
State Water Resources Control Board Res. No. 68-16	The “Antidegradation Policy” mandates that: 1) existing high quality waters of the State are maintained until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonable affect present and anticipated beneficial uses, and will not result in waste quality less than adopted policies; and 2) requires that any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters, must meet WDRs which will result in the best practicable treatment or control of the discharge necessary to assure that: a) a pollution or nuisance will not occur and b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.
State Water Resources Control Board Res. 75-58	The principal policy of the SWRCB that addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant

Applicable LORs	***Description***
	Cooling (adopted by the Board on June 19, 1976, by Resolution 75-58). This policy states that use of fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. In a letter dated January 20, 20100, the SWRCB clarified that this policy applies in most cases to surface water, not groundwater.
State Water Resources Control Board Res. No. 88-63	States that all groundwater and surface water of the State are considered to be suitable for municipal or domestic water supply with the exception of those waters that meet specified conditions.
State Water Resources Control Board Res. 2005-0006	Adopts the concept of sustainability as a core value for State Water Board programs and directs its incorporation in all future policies, guidelines, and regulatory actions.
State Water Resources Control Board Res. 2008-0030	Requires sustainable water resources management such as low impact development (LID) and climate change considerations, in all future policies, guidelines, and regulatory actions. Directs Regional Water Boards to “aggressively promote measures such as recycled water, conservation and LID Best Management Practices where appropriate and work with Dischargers to ensure proposed compliance documents include appropriate, sustainable water management strategies.”

TRAFFIC AND TRANSPORTATION

Applicable LORS	***Description***
Federal	
Code of Federal Regulations Title 49, Sections 171-177	Governs the transportation of hazardous materials and related guidelines.
Code of Federal Regulations Part 77, Federal Aviation Administration Regulations	Implements standards for determining obstructions in navigable airspace. Sets forth requirements for notice to the Federal Aviation Administration of certain proposed construction or alteration. In addition, provides for aeronautical studies of obstructions to air navigation to determine their effect on the safe and efficient use of airspace.
Code of Federal Regulations Title 49, Sections 350-399 and Appendices A-G	Includes procedures and regulations pertaining to interstate and intrastate transport (includes hazardous materials program procedures) and provides safety measures for motor carriers and motor vehicles who operate on public highways.
State	
California Vehicle Code Division 2, Chapter 2.5, Division 6, Chapter 7, Division 13, Chapter 5, Division 14.1, Chapter 1 and 2, Division 14.8, Division 15	Includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways, safe operation of vehicles, and the transportation of hazardous materials.
California Streets and Highway Code Division 1 and 2, Chapter 3 and Chapter 5.5	Includes regulations for the care and protection of State and County highways, and provisions for the issuance of written permits.
Local	
County of San Bernardino General Plan Circulation and Infrastructure Element	Requires that land use and transportation planning are coordinated to ensure adequate facilities to support development and ease congestion. In addition, the transportation system shall provide a safe, functional, and convenient mode of travel.
County of San Bernardino Traffic Impact Study Guidelines	Requires that all County roadways operate at Level of Service (LOS) D conditions or better.
San Bernardino Associated Governments Congestion Management Plan	Requires that all City roadways and intersections operate at LOS D conditions or better.
City of Barstow General Plan Circulation and Transportation Element	Requires that all City roadways and intersections operate at LOS E conditions or better.

TRANSMISSION LINE SAFETY AND NUISANCE

Applicable LORS	*Description*
Aviation Safety	
Federal	
Title 14, Part 77 of the Code of Federal Regulations (CFR),"Objects Affecting the Navigable Air Space"	Describes the criteria used to determine the need for a Federal Aviation Administration (FAA) "Notice of Proposed Construction or Alteration" in cases of potential obstruction hazards.
FAA Advisory Circular No. 70/7460-1G, " Proposed Construction and/or Alteration of Objects that May Affect the Navigation Space"	Addresses the need to file the "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA in cases of potential for an obstruction hazard.
FAA Advisory Circular 70/460-1G, "Obstruction Marking and Lighting"	Describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.
Interference with Radio Frequency Communication	
Federal	
Title 47, CFR, Section 15.2524, Federal Communications Commission (FCC)	Prohibits operation of devices that can interfere with radio-frequency communication.
State	
California Public Utilities Commission (CPUC) General Order 52 (GO-52)	Governs the construction and operation of power and communications lines to prevent or mitigate interference.
Audible Noise	
Local	
San Bernardino County Development Code.	Sets noise limits for specific land uses.
San Bernardino County Noise Ordinance.	Sets sound level limits at residences and outdoor activity areas.

Applicable LORS	*Description*
Hazardous and Nuisance Shocks	
State	
CPUC GO-95, “Rules for Overhead Electric Line Construction”	Governs clearance requirements to prevent hazardous shocks, grounding techniques to minimize nuisance shocks, and maintenance and inspection requirements.
Title 8, California Code of Regulations (CCR) Section 2700 et seq. “High Voltage Safety Orders”	Specifies requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.
National Electrical Safety Code	Specifies grounding procedures to limit nuisance shocks. Also specifies minimum conductor ground clearances.
Industry Standards	
Institute of Electrical and Electronics Engineers (IEEE) 1119, “IEEE Guide for Fence Safety Clearances in Electric-Supply Stations”	Specifies the guidelines for grounding-related practices within the right-of-way and substations.
Electric and Magnetic Fields	
State	
GO-131-D, CPUC ”Rules for Planning and Construction of Electric Generation Line and Substation Facilities in California”	Specifies application and noticing requirements for new line construction including EMF reduction.
CPUC Decision 93-11-013	Specifies CPUC requirements for reducing power frequency electric and magnetic fields.
Industry Standards	
American National Standards Institute (ANSI/IEEE) 644-1944 Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines	Specifies standard procedures for measuring electric and magnetic fields from an operating electric line.
Fire Hazards	
State	
14 CCR Sections 1250-1258, “Fire Prevention Standards for Electric Utilities”	Provides specific exemptions from electric pole and tower firebreak and conductor clearance standards and specifies when and where standards apply.

TRANSMISSION SYSTEM ENGINEERING

Applicable LORS	***Description***
The North American Electric Reliability Corporation (NERC)	North American Reliability Council (NERC) Reliability Standards for the Bulk Electric Systems of North America provide national policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. The NERC Reliability Standards provide for system performance levels under normal and contingency conditions. With regard to power flow and stability simulations, while these Reliability Standards are similar to NERC/WECC Standards, certain aspects of the NERC/WECC Standards are either more stringent or more specific than the NERC Standards for Transmission System Contingency Performance. The NERC Reliability Standards apply not only to interconnected system operation but also to individual service areas (NERC 2006).
Western Electricity Coordinating Council's (WECC)	The Western Electricity Coordinating Council (WECC) Planning Standards are merged with the North American Electric Reliability Council (NERC) Planning Standards and provide the system performance standards used in assessing the reliability of the interconnected system. These standards require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. Certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards alone. These standards provide planning for electric systems so as to withstand the more probable forced and maintenance outage system contingencies at projected customer demand and anticipated electricity transfer levels, while continuing to operate reliably within equipment and electric system thermal, voltage and stability limits. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WECC system is based to a large degree on Section I.A of the standards, "NERC and WECC Planning Standards with Table I and WECC Disturbance-Performance Table" and on Section I.D, "NERC and WECC Standards for Voltage Support and Reactive Power". These standards require that the results of power flow and stability simulations verify defined performance

	levels. Performance levels are defined by specifying the allowable variations in thermal loading, voltage and frequency, and loss of load that may occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a level that seeks to prevent system cascading and the subsequent blackout of islanded areas during a major disturbance (such as loss of multiple 500 kV lines along a common right of way, and/or multiple generators). While controlled loss of generation or load or system separation is permitted in certain circumstances, their uncontrolled loss is not permitted (WECC 2006).
California Public Utilities Commission (CPUC) General Order 95 (GO-95*), Rules for Overhead Electric Line Construction*	Specifies uniform requirements for the construction of overhead electric lines. Compliance with this order ensures both reliable service and a safe working environment for those working in the construction, maintenance, operation, or use of overhead electric lines, and for the safety of the general public.
CPUC General Order 128 (GO-128), *Rules for Underground Electric Line Construction*	Establishes uniform requirements for the construction of underground electric lines. Compliance with this order also ensures both reliable service and a safe working environment for those working in the construction, maintenance, operation, or use of underground electric lines, and for the safety of the general public.
National Electric Safety Code 1999	Provides electrical, mechanical, civil, and structural requirements for overhead electric line construction and operation.
California Independent System Operator (CAISO)	California ISO Planning Standards also provide standards, and guidelines to assure the adequacy, security and reliability in the planning of the California ISO transmission grid facilities. The California ISO Grid Planning Standards incorporate the NERC/WECC and NERC Reliability Planning Standards. With regard to power flow and stability simulations, these Planning Standards are similar to the NERC/WECC or NERC Reliability Planning

	Standards for Transmission System Contingency Performance. However, the California ISO Standards also provide some additional requirements that are not found in the WECC/NERC or NERC Standards. The California ISO Standards apply to all participating transmission owners interconnecting to the California ISO controlled grid. They also apply when there are any impacts to the California ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the California ISO (California ISO 2002a). California ISO/FERC Electric Tariff provides guidelines for construction of all transmission additions/upgrades (projects) within the California ISO controlled grid. The California ISO determines the “Need” for the proposed project where it will promote economic efficiency or maintain system reliability. The California ISO also determines the Cost Responsibility of the proposed project and provides an Operational Review of all facilities that are to be connected to the California ISO grid (California ISO 2007a).

VISUAL RESOURCES

Applicable LORS	*Description*
Federal	
	The project site does not include federal managed lands, a recognized National Scenic Byway or All-American Road.
	The BLM manages the Harper Dry Lake Watchable Wildlife Area adjoining the project site to the northeast. The area consists of a small parking lot, rest room, and gravel trails leading to observation decks at the western edge of Harper Dry Lake. The area is adjacent to the northeastern portion of the project site. See discussion under **REGIONAL LANDSCAPE.**
State	
	There are no state-designated scenic highways within the vicinity of the project. State Route 58 between Mojave and Barstow has been listed as eligible for designation as a state scenic highway since 1963 when the state scenic highway system was originally established. The highway has never been nominated for designation as a state scenic highway.
Local	
San Bernardino County General Plan, adopted March, 2007	
Conservation Element	***Countywide Policy CO 1.2:*** The preservation of some natural resources requires the establishment of a buffer area between the resource and developed areas. The County will continue the review of the Land Use Designations for unincorporated areas within one mile of any state or federally designated scenic area, national forest, national monument, or similar area, to ensure that sufficiently low development densities and building controls are applied to protect the visual and natural qualities of these areas.
	Desert Region Policy D/CO 1.2: Require future land development practices to be compatible with the existing topography and scenic vistas, and protect the natural vegetation.
	Desert Region Policy D/CO 1.3: Require retention of existing native vegetation for new development Projects,

Applicable LORS	Description
	particularly Joshua trees, Mojave yuccas and creosote rings, and other species protected by the Development Code and other regulations.
	Desert Region Policy D/CO 3.1: Protect the Night Sky by providing information about and enforcing existing ordinances: b. Review exterior lighting as part of the design review process.
	Desert Region Policy D/CO 3.2: All outdoor lighting, including street lighting, shall be provided in accordance with the Night Sky Protection Ordinance and shall only be provided as necessary to meet safety standards.
Open Space Element	***Countywide Policy OS 5.3:*** The County desires to retain the scenic character of visually important roadways throughout the County. A “scenic route” is a roadway that has scenic vistas and other scenic and aesthetic qualities that over time have been found to add beauty to the County.
San Bernardino County Development Code	The San Bernardino Development Code implements the San Bernardino General Plan. Section 83.02 of the Code, Development and Use Standards, contains standards for screening and buffering while Section 83.10 contains Landscaping Standards. Section 84.29.50 specifies fencing standards for renewable projects.

WASTE MANAGEMENT

Applicable LORS	*Description*
Federal	
RCRA, Subtitle C and D, 42 USC § 6901 to 6992k, and Section 6.12.2.1	Establishes requirements for the management of solid wastes (including hazardous wastes), landfills, underground storage tanks, and certain medical wastes. The statute also addresses program administration, implementation and delegation to states, enforcement provisions and responsibilities, as well as research, training, and grant funding provisions. RCRA Subtitle C establishes provisions for the generation, storage, treatment, and disposal of hazardous waste, including requirements addressing: • Generator record keeping practices that identify quantities of hazardous wastes generated and their disposition; • Waste labeling practices and use of appropriate containers; • Use of a manifest when transporting wastes; • Submission of periodic reports to the United States Environmental Protection Agency (USEPA) or other authorized agency; and • Corrective action to remediate releases of hazardous waste and contamination associated with RCRA-regulated facilities. RCRA Subtitle D establishes provisions for the design and operation of solid waste landfills. RCRA is administered at the federal level by USEPA and its ten regional offices. The Pacific Southwest regional office (Region 9) implements USEPA programs in California, Nevada, Arizona, and Hawaii.
40 CFR 260, *et seq.*	Contains regulations promulgated by the EPA to implement the requirements of RCRA as described above. Characteristics of hazardous waste are described in terms of ignitability, corrosively, reactivity, and toxicity, and specific types of waste are listed.
Federal CWA, 33 USC § 1251 *et seq.*	Controls discharge of wastewater to the surface waters of the U.S.
Title 40 CFR Section 112	This establishes procedures, methods, equipment, and other requirements to prevent the discharge of oil from non-transportation-related onshore and offshore facilities into or upon the navigable waters of the United States or adjoining shorelines, or into or upon the waters of the contiguous zone, or in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974. Subpart B - The Spill Prevention, Control and Countermeasures (SPCC) Plan includes procedures, methods, and equipment at the facility to prevent discharges of petroleum from reaching navigable waters.

Applicable LORS	***Description***
State	
Public Resources Code § 40000 *et seq.,* California Integrated Waste Management Act of 1989	Provides an integrated statewide system of solid waste management by coordinating state and local efforts in source reduction, recycling, and land disposal safety. Counties are required to submit Integrated Waste Management Plans to the state.
Title 14, California Code of Regulations (CCR), Division 7, 17200, et seq.	These regulations further implement the provisions of the California Integrated Waste Management Act and set forth minimum standards for solid waste handling and disposal. The regulations include standards for solid waste management, as well as enforcement and program administration provisions.
Porter- Cologne Water Quality Control Act of 1998, Water Code § 13000 *et seq.*	Controls discharge of wastewater to surface waters and groundwaters of California.
Title 22, (CCR), Division 4.5. Environmental Health Standards for the Management of Hazardous Waste	These regulations establish requirements for the management and disposal of hazardous waste in accordance with the provisions of the California Hazardous Waste Control Act and federal RCRA. As with the federal requirements, waste generators must determine if their wastes are hazardous according to specified characteristics or lists of wastes. Hazardous waste generators must obtain identification numbers; prepare manifests before transporting the waste off site; and use only permitted treatment, storage, and disposal facilities. Generator standards also include requirements for record keeping, reporting, packaging, and labeling. Additionally, while not a federal requirement, California requires that hazardous waste be transported by registered hazardous waste transporters. The standards addressed by Title 22, CCR include: • Identification and Listing of Hazardous Waste (Chapter 11, §66261.1, et seq.). • Standards Applicable to Generator of Hazardous Waste (Chapter 12, §66262.10, et seq.). • Standards Applicable to Transporters of Hazardous Waste (Chapter 13, §66263.10, et seq.). • Standards for Universal Waste Management (Chapter 23, §66273.1, et seq.). • Standards for the Management of Used Oil (Chapter 29, §66279.1, et seq.). The Title 22 regulations are established and enforced at the state level by DTSC. Some generator and waste treatment standards are also enforced at the local level by Certified Unified Program Agencies (CUPAs).
Title 22, (CCR) § 66262.34	Regulates accumulation periods for hazardous waste generators. Typically, hazardous waste cannot be stored onsite for more than 90 days.

Applicable LORS	***Description***
Title 23, (CCR) Division 3, Chapter 30	This Chapter requires the submission of analytical test results and other monitoring information electronically over the internet to the State Water resources Control Board's Geotracker data base.
Title 22, CCR, Section §66260.20(f), Chapter 10, Article 3, Classification of a Waste as Hazardous or Nonhazardous.	If a person wishes to classify and manage as nonhazardous a waste which would otherwise be a non-RCRA hazardous waste because it has mitigating physical or chemical characteristics which render it insignificant as a hazard to human health and safety, livestock and wildlife, that person shall apply to the Department of Toxic Substances Control (DTSC) for its approval to classify and manage the waste as nonhazardous.
California Health and Safety Code (HSC) § 25100 *et seq.* (Hazardous Waste Control Act of 1972, as amended)	Creates the framework under which hazardous wastes must be managed in California. It mandates the DTSC under the California Environmental Protection Agency (CalEPA), to develop and publish a list of hazardous and extremely hazardous wastes and to develop and adopt criteria and guidelines for the identification of such wastes. It also requires hazardous waste generators to file notification statements with Cal EPA and create a manifest system to be used when transporting such wastes.
California Health and Safety Code (HSC) § 25270-25270.13	25270. This chapter shall be known and may be cited as the Aboveground Petroleum Storage Act. 25270.2. For purposes of this chapter, the following definitions apply: (a) "Aboveground storage tank" or "storage tank" means a tank that has the capacity to store 55 gallons or more of petroleum and that is substantially or totally above the surface of the ground. "Aboveground storage tank" does not include any of the following: (1) A pressure vessel or boiler that is subject to Part 6 (Commencing with Section 7620) of Division 5 of the Labor Code. (2) A tank containing hazardous waste, as defined in subdivision (g) of Section 25316, if the Department of Toxic Substances Control has issued the person owning or operating the tank a hazardous waste facilities permit for the storage tank. (3) An aboveground oil production tank that is subject to Section 3106 of the Public Resources Code. (4) Oil-filled electrical equipment, including, but not limited to, transformers, circuit breakers, or capacitors, if the oil-filled electrical equipment meets either of the following conditions: (A) The equipment contains less than 10,000 gallons of dielectric fluid. (B) The equipment contains 10,000 gallons or more of dielectric fluid with PCB levels less than 50 parts per million, appropriate containment or diversionary structures or equipment are employed to prevent discharged oil from reaching a navigable water course, and the electrical equipment is visually inspected in accordance with the usual routine maintenance procedures of the owner or operator. (5) A tank regulated as an underground storage tank under Chapter

Applicable LORS	Description
	6.7 (commencing with Section 25280) of this code and Chapter 16 (commencing with Section 2610) of Division 3 of Title 23 of the California Code of Regulations.
Title 27, CCR, §15100 et seq. (Unified Hazardous Waste and Hazardous Materials Management Regulatory Program)	Consolidates, coordinates, and makes consistent portions of the following six existing programs: • Hazardous Waste Generators and Hazardous Waste Onsite Treatment; • Underground Storage Tanks; • Hazardous Material Release Response Plans and Inventories; • California Accidental Release Prevention Program; • Aboveground Storage Tanks (spill control and countermeasure plan only); • Uniform Fire Code Hazardous Material Management Plans and Inventories; The statute requires all counties to apply to the CalEPA Secretary for the certification of a local unified program agency.
Title 14, CCR, §17200 et seq. (Minimum Standards for Solid Waste Handling and Disposal)	Sets forth minimum standards for solid waste handling and disposal, guidelines to ensure conformance of solid waste facilities with county solid waste management plans and the California Integrated Waste Management Board, as well as enforcement and administration provisions.
Title 23, CCR, Chapter 15	The regulation in this chapter establishes waste and site classification and waste management requirements for waste treatment storage, or disposal in landfills, surface impoundments, waste piles and land treatment facilities.

Applicable LORS	Description
Local	
San Bernardino County Ordinance, Title 3 Health and Safety:	These regulations govern the use, generation, storage, and disposal of hazardous materials and wastes with San Bernardino County Fire Department serves as the local CUPA authorized to implement the provisions of the California Unified Program elements. San Bernardino County Public Works Department, Solid Waste Division, has developed a solid waste program to oversee the handling, processing, and disposal of non-hazardous solid waste to safeguard public health.
Mojave Desert Air Quality Management District Rule 306	The purpose of the rule is to specify work practice requirements to limit asbestos emissions from building demolition and renovation activities, including the removal and associated disturbance of asbestos-containing materials.

WORKER SAFETY AND FIRE PROTECTION

Applicable LORS	*Description*
Federal	
Title 29 U.S. Code (USC) section 651 et seq (Occupational Safety and Health Act of 1970)	This act mandates safety requirements in the workplace with the purpose of "[assuring] so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources" (29 USC § 651).
Title 29 Code of Federal Regulation (CFR) sections 1910.1 to 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations)	These sections define the procedures for promulgating regulations and conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector.
29 CFR sections 1952.170 to 1952.175	These sections provide federal approval of California's plan for enforcement of its own Safety and Health requirements, in lieu of most of the federal requirements found in 29 CFR sections 1910.1 to 1910.1500.
State	
Title 8 California Code of Regulations (Cal Code Regs.) all applicable sections (Cal/OSHA regulations)	These sections require that all employers follow these regulations as they pertain to the work involved. This includes regulations pertaining to safety matters during construction, commissioning, and operations of power plants, as well as safety around electrical components, fire safety, and hazardous materials use, storage, and handling.
24 Cal Code Regs. section 3, et seq.	This section incorporates the current addition of the Uniform Building Code.
Health and Safety Code section 25500, et seq.	This section presents Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at a facility.
Health and Safety Code sections 25500 to 25541	These sections require a Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at a facility.
Local (or locally enforced)	
Fire and Hazardous Materials: San Bernardino County Code, Title 2, Division 3, Chapter 1 et seq.	Includes California Fire Code and specific codes to regulate permits activities and administrative penalties. Adopts the 2007 California Fire Code and adopts State requirements and guidelines as governing hazardous materials release response plans and inventories.
Health and Safety: San Bernardino County Code Title 3, Division 1, et seq.	Includes specific codes to regulate permits, activities (e.g., solid waste management), and administrative penalties.

Building and Construction: San Bernardino County Code, Title 6, Division 3, Chapter 1 et seq.	Adopts national standards such as Uniform Building Code and National Electrical Code.

Docket Number: **09-AFC-5** Date: **July 15, 2010**

Project Name: **Abengoa Mojave Solar Project (AMS)**

FINAL EXHIBIT LIST

Exhibit	Brief Description	Stipulation	Offered	Admitted	Refused	CEC Use Only
Applicant's Proposed Exhibits						
1	Mojave Solar One's Application for Certification – Volumes 1, 2 and 3, dated 7/2009, Docket ID 52813 [DOCUMENT AVAILABLE UPON REQUEST]			X		
2	Data Adequacy Supplement dated 9/24/2009, Docket ID 53375			X		
3	Data Response to Set 1A – dated 11/23/09, Docket ID 54243			X		
4	Data Response to Set 1B – dated 11/25/09, Docket ID 54268			X		
5	Supplemental Data Response to Set 1A – dated 12/23/09, Docket ID 54582			X		
6	Supplemental Data Response to Set 1B – dated 12/23/09, Docket ID 54581			X		
7	Modeling files for Soil and Water Resources – dated 12/23/09, Docket ID 54595			X		
8	Supplemental Data Response to Set 1B Cultural – dated 1/5/10, Docket ID 54685			X		
9	Supplementary MODFLOW Files - dated 12/30/2009, Docket ID 54698			X		
10	Replacement Written Response to Visual Resources - dated 1/8/10, Docket ID 54730			X		
11	Supplemental Data Response to Set 1A Air Quality and Public Health – dated 1/11/10, Docket ID 54756			X		
12	Groundwater Modeling Analysis -dated 1/15/10, Docket ID 54856			X		
13	Second Supplemental Data Response for Set 1A for Air Quality and Public Health – dated 2/2/10; Docket ID 55150			X		
14	Second Supplemental Data Response for Set 1B Water Resources - 2/16/10, Docket ID 55435			X		
15	Revised Figure for Supplemental Data Response for Set 1B Water Resources – dated 2/17/10; Docket ID 55468			X		

16	Second Supplemental Response to Data Request Set 1B Cultural Resources - 2/17/10, Docket ID 55470			X		
17	Response to Memo from Heather Blair re Time Sensitive Issues – dated 2/24/10, Docket ID 55634			X		
18	Interconnection Study - dated 1/14/2010, Docket ID 55679			X		
19	Revised Second Supplemental Response to Data Request Set 1A Air Quality and Public Health – dated 2/25/10, Docket ID 55678			X		
20	Site Material Sampling Report - dated 4/5/2010, Docket ID 56127			X		
21	Draft Desert Tortoise Clearance and Relocation/Translocation Plan submitted 4/6/10, Docket ID 56126			X		
22	Information provided to the Regional Water Quality Control Board Lahontan Region for Report of Waste Discharge application - 4/16/10, Docket ID 56270			X		
23	Responses to CURE's Data Requests Set 1 - 4/16/10, Docket ID 56311			X		
24	Burrowing Owl Monitoring and Mitigation Plan – dated 4/19/10, Docket ID 56301			X		
25	Site Sampling Analysis - dated 4/16/10, Docket ID 56310 and 56326			X		
26	Applicant's Comments on Staff Assessment - dated 4/21/10, Docket ID 56350			X		
27	Environmental Analysis for the Lockhart Substation Interconnection and Communications Facility – dated 4/16/10, Docket ID 56359			X		
28	Transmission Interconnection Map – Docket ID 56359			X		
29	Biological Resources Appendix – dated 4/20/10, Docket ID 56358			X		
30	Draft Biological Assessment – dated 4/27/10, Docket ID 56418			X		
31	Golden Eagle Nest Survey Results – dated 5/4/10, Docket ID 56516			X		
32	Revised Mojave Solar 1-hour NO2 Modeling Assessment – dated 5/4/10, Docket ID 56545			X		
33	One-line diagram of interconnection to Lockhart Substation - 5/4/10, Docket ID 56546			X		
34	Surface Soil Sampling – dated 1/26/10, Docket ID 55001			X		
35	Areas of Critical Ecological Concern Mapping Corrections - Dated 10/12/09, Docket ID 53625			X		
36	U.S. Army Corps of Engineers Determination Regarding Requirement for U.S. Army Corps of Engineers Permit – dated 2/26/10, Docket ID 55775			X		
37	U.S. Army Corps of Engineers Approved Jurisdictional Determination Regarding Absence of Geographical Jurisdiction – dated 2/26/10, Docket ID 55776			X		
38	Mitigation Site Assessment, Docket ID 56276			X		

39	Authority to Construct Permit Application, July 20, 2009, Docketed with the AFC			X		
40	SWCA, Application for Confidential Designation and "Geoarcheological Testing Report for the Mojave Solar Project, Lockhart, California," dated December 23, 2009, Docket ID 54601 [CONFIDENTIAL DOCUMENT – NOT INCLUDED IN FILES]			X		
41	Storm Channel Surface Profile, Docket ID 56263			X		
42	CA Department of Conservation's Letter Re Agriculture Mitigation, dated April 7, 2010, Docket ID 56177			X		
43	Department of Conservation's Revised Abengoa LESA model, dated May 4, 2010, Docket ID 56547			X		
44	Letter regarding Power Purchase Agreement – dated 10/8/09, Docket ID 53595			X		
45	Applicant's Letter regarding Transmission Interconnection dated February 5, 2010, Docket ID 55215			X		
46	Letter from N. Abboud regarding Queuing Analysis for the SR58 left turn lane at Harper Lake Road – dated 5/27/10, Docket ID 56970			X		
47	HCM Unsignalized Intersection Capacity Analysis – dated 5/26/10, Docket ID 56970			X		
48	Applicant's Opening Testimony – dated 6/1/10, Docket ID 56790			X		
49	Preliminary Determination of Compliance – dated 3/1/10, Docket ID 55711			X		
50	Final Determination of Compliance – dated 5/17/2010, Docket ID 56808			X		
51	Supplemental Response to CURE's Data Requests – Set 1 – dated 4/28/10, Docket ID 56462			X		
52	Applicant's Supplemental Opening Testimony on Worker Safety and Fire Protection			X		
53	Excerpts from San Bernardino County Fire Department 2009 Annual report)		X	X		
CEC Staff's Proposed Exhibits						
300	Staff Assessment for the Abengoa Mojave Solar Project, dated March 15, 2010 and docketed March 15, 2010. (a) ~~Executive Summary~~ (to be superseded by Supplemental Staff Assessment – Part C) (b) Introduction (c) ~~Project Description~~ (superseded by Supplemental Staff Assessment – Part B) (d) Cumulative Analysis (e) ~~Air Quality~~ (superseded by Supplemental Staff Assessment – Part B)			X		

	(f) ~~Biological Resources~~ (superseded by Supplemental Staff Assessment – Part B) (g) ~~Cultural Resources~~ (superseded by Supplemental Staff Assessment – Part B) (h) ~~Hazardous Materials~~ (superseded by Supplemental Staff Assessment – Part A) (i) ~~Land Use~~ (superseded by Supplemental Staff Assessment – Part B) (j) ~~Noise and Vibration~~ (superseded by Supplemental Staff Assessment – Part A) (k) ~~Public Health~~ (superseded by Supplemental Staff Assessment – Part A) (l) Socioeconomic Resources (m) ~~Soil and Water Resources~~ (superseded by Supplemental Staff Assessment – Part B) (n) ~~Traffic and Transportation~~ (superseded by Supplemental Staff Assessment – Part A) (o) Transmission Line Safety and Nuisance (p) ~~Visual Resources~~ (superseded by Supplemental Staff Assessment – Part A) (q) ~~Waste Management~~ (superseded by Supplemental Staff Assessment – Part A) (r) ~~Worker Safety and Fire Protection~~ (superseded by Supplemental Staff Assessment – Part A and Supplemental Opening Testimony of Alvin Greenberg, Ph.D. on Worker Safety and Fire Protection) (s) Facility Design (t) Geology and Paleontology (u) Power Plant Efficiency (v) Power Plant Reliability (w) ~~Transmission System Engineering~~ (superseded by Supplemental Staff Assessment – Part C) (x) Alternatives (y) General Conditions (z) Declarations and Witness Qualifications of: • Suzanne Phinney • Obed Odoemelam, Ph.D. • Erin Bright • Chris Davis • Michael Lindholm • Craig Hoffman • Scott Debauche					
301	Supplemental Staff Assessment – Part A for the Abengoa Mojave Solar Project, dated May 12, 2010 and docketed May 12, 2010.			X		

	~~(a)~~ (b) Hazardous Materials (c) Noise and Vibration (d) Public Health (e) Traffic and Transportation (f) Visual Resources (g) Waste Management (h) Worker Safety and Fire Protection (i) Declarations and Witness Qualifications of: • Alvin Greenberg, Ph. D. • Shahab Khoshmashrab • Steven J. Brown, PE • William D. Kanemoto • James E. Jewell • Thomas Packard • Ellen Townsend-Hough					
302	Supplemental Staff Assessment – Part B for the Abengoa Mojave Solar Project, dated May 25, 2010 and docketed May 25, 2010. ~~(a)~~ (b) Project Description (c) Air Quality/GHG (d) Biological Resources (e) Cultural Resources (f) Land Use (g) Soil and Water Resources ~~(h)~~ (i) Declarations and Witness Qualifications of: • Craig Hoffman • Tao Jiang • William Walters, PE • Heather Blair • Kathleen Forrest • Negar Vahidi • Susanne Huerta • Christopher Dennis • John Fio • Eugene Yates • Mike Conway			X		
303	Supplemental Staff Assessment – Part C for the Abengoa Mojave Solar Project (a) Executive Summary			X		

	(b) Transmission System Engineering, including Appendix A (c) Declarations and Witness Qualifications of: • Craig Hoffman • Heather Blair • Ajoy Guha, PE • Mark Hesters					
304	CEC Staff's Errata to SSA Part B – Biological Resources, dated June 9, 2010 and docketed on June 9, 2010			X		
305	CEC Staff's Errata to SSA Part B – Air Quality Declarations and Witness Qualifications of: • Tao Jiang • William Walters			X		
306	CEC Staff's Rebuttal Testimony to the Applicant's Opening Testimony, dated June 17, 2010 and docketed on June 17, 2010 (a) Biological Resources (b) Hazardous Materials (c) Noise and Vibration (d) Soil and Water Resources (e) Traffic and Transportation (f) Visual Resources (g) Waste Management (h) Worker Safety and Fire Protection (i) Declarations and Witness Qualifications in support of Staff's Rebuttal Testimony dated June 17, 2010, of: • Heather Blair • Alvin Greenberg, Ph.D. • Shahab Khoshmashrab • Christopher Dennis • John Fio • Eugene Yates • Mike Conway • Steven Brown, PE • Thomas Packard • William Kanemoto • James Jewell • Ellen Townsend-Hough			X		
307	*City of Barstow v. City of Adelanto*, Superior Court of Riverside County, No. 208568, Judge Erik Michael Kaiser, "Judgment After Trial" (Jan. 10, 1996)			X		
308	*City of Barstow v. City of Adelanto*, Superior Court of Riverside County, No. 208568, Judge Erik Michael Kaiser, "Amended Statement of Decision" (Jan. 2, 1996)			X		

309	*City of Barstow v. Mojave Water Agency* (2000) 23 Cal. 4th 1224			X		
310	Mojave Basin Area Watermaster Annual Report for Water Year 2008-2009 (May 1, 2010) (without Appendices)			X		
311	Appendix L of Mojave Basin Area Watermaster Annual Report for Water Year 2008-2009 (May 1, 2010)			X		
312	Email dated June 28, 2010, from Ashleigh Blackford of United States Fish and Wildlife Service to Heather Blair of CEC Staff			X		
313	Supplemental Opening Testimony of Alvin Greenberg, Ph.D. on Worker Safety and Fire Protection Declaration of Alvin Greenberg, Ph.D.			X		
314	(Reserved) Supplemental Rebuttal Testimony on: (a) Worker Safety and Fire Protection (b) Air Quality (c) Transmission System Engineering, including Appendix A (d) Declarations of: • Alvin Greenberg, Ph.D. • Tao Jiang • William Walters • Ajoy Guha, PE • Mark Hesters • Heather Blair			X		
315	ROC Between R. Frymyer General Manager for SEGS 1 and 2 and Shon Greenberg (May 25, 2010)			X		
316	Staff Decision Matrix			X		
317	Staff Draft Summary of SBCFD Responses to Solar Power Plants			X		
318	SBCFD - Response Log 1998 to 2009			X		
319	SBCFD - Mitigation Response Material from June 2010			X		
320	SBCFD - Log Notes from January 1999			X		
321	SBCFD - Activity Log			X		
322	SBCFD - Plan Reviews at Solar Plants			X		
323	SBCFD - Response Log 1998 to 2009			X		
324	SBCFD - Haz Mat Inspections			X		
325	EMS Response from SBCFD			X		
326	SBCFD staffing cost estimates for a fire station			X		
327	SBCFD Estimated Costs Station Construction, Equipment and Staffing			X		
328	SBCFD Map of Renewable Energy Projects, March 2010			X		
329	Estimated Allocation of Fire Facility Costs to Proposed Solar Energy Installations prepared by Hoffman Associates for San Bernardino County Fire Department			X		

330	Occupational Safety and Health Administration - Fire Fighters' Two-in/Two-out Regulation.			X		
331	ROC between Battalion Chief Mike Weis, San Bernardino County Fire Department, and Shon Greenberg (January 5, 2010)			X		
332	ROC between Peter Brierty, Assistant Chief/Fire Marshal, San Bernardino County Fire Department, and Alvin Greenberg (June 15, 2010)			X		
333	Statement of Qualifications and Experience of Peter Brierty			X		
334	Statement of Qualifications and Experience of Stanley R. Hoffman			X		

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
FOR THE *ABENGOA MOJAVE SOLAR POWER PLANT*

Docket No. 09-AFC-5
PROOF OF SERVICE
(Revised 8/6/2010)

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
VP Business Development
Abengoa Solar Inc.
235 Pine Street, Suite 1800
San Francisco, CA 94104
tandy.mcmannes@solar.abengoa.com

APPLICANT'S CONSULTANTS
Frederick H. Redell, PE
Engineering Manager
Abengoa Solar, Inc.
11500 West 13th Avenue
Lakewood, CO 80215
frederick.redell@solar.abengoa.com

COUNSEL FOR APPLICANT
Christopher T. Ellison
Ellison, Schneider & Harris
2600 Capitol Ave., Suite 400
Sacramento, CA 95816
cte@eslawfirm.com

INTERESTED AGENCIES
California ISO
E-mail Preferred
e-recipient@caiso.com

INTERVENORS
County of San Bernardino
Ruth E. Stringer, County Counsel
Bart W. Brizzee, Deputy County Counsel
385 N. Arrowhead Avenue, 4th Floor
San Bernardino, CA 92415-0140
bbrizzee@cc.sbcounty.gov

California Unions for Reliable Energy ("CURE")
Tanya A. Gulesserian
Marc D. Joseph
Elizabeth Klebaner
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
E-mail Preferred
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

Kourtney Vaccaro
Hearing Officer
kvaccaro@energy.state.ca.us

Lorraine White
Adviser to Commissioner Eggert
lwhite@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
E-mail Preferred
publicadviser@energy.state.ca.us

*indicates change

DECLARATION OF SERVICE

I, Maggie Read, declare that on September 15, 2010, I served electronically and filed a CD of the Final Commission Decision, to all parties to the proceeding. The original documents, filed with the Docket Unit, are accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [http://www.energy.ca.gov/sitingcases/abengoa/index.html]. The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

For service to all other parties:

__x___ sent electronically to all email addresses on the Proof of Service list;

_____ by personal delivery;

____ by delivering on this date, for mailing with the United States Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses NOT marked "email preferred."

AND

For filing with the Energy Commission:

_x___ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (preferred method);

OR

_____depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 09-AFC-5
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Original Signed By:

_____
Maggie Read
Hearing Adviser's Office