

COMMISSION DECISION

APPLICATION FOR CERTIFICATION

ELK HILLS

POWER PROJECT

Docket No. 99-AFC-1



Gray Davis, *Governor*

DECEMBER 2000

CALIFORNIA
ENERGY
COMMISSION

P 800-00-013

**CALIFORNIA ENERGY
COMMISSION**

Committee

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Hearing Office

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Major Williams, Jr., Hearing Officer

STATE OF CALIFORNIA

**Energy Resources
Conservation and Development Commission**

In the Matter of:) **Docket No. 99-AFC-1**
)
Application for Certification) **COMMISSION ADOPTION ORDER**
for the Elk Hills Cogeneration)
Power Project)
_____)

This Commission Order adopts the Commission Decision on the Elk Hills Cogeneration Power Project. It incorporates the Presiding Member's Proposed Decision (PMPD) in the above-captioned matter and the Committee Errata (___Date_____) thereto. The Commission Decision is based upon the evidentiary record of these proceedings (Docket No. 99-AFC-1) and considers the comments received at the ----- 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 PMPD 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 Elk Hills Power Project is a merchant power plant whose capital costs will not be borne by the State's electricity ratepayers.
2. The Conditions of Certification contained in the accompanying text, if implemented by the Applicant, 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 evidence of record establishes that no feasible alternatives to the project, as described during these proceedings, exist.
6. The evidence of the record does not establish the existence of any environmentally superior alternative site.
7. The PMPD 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.
8. 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 Elk Hills Power 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 Applicant 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. For purposes of reconsideration pursuant to Public Resources Code section 25530, this Decision is deemed adopted when filed with the Commission's Docket Unit.
4. For purposes of judicial review pursuant to Public Resources Code section 25531, this Decision is final thirty (30) days after its filing in the absence of the filing of a petition for reconsideration or, if a petition for reconsideration is filed within thirty (30) days, upon the adoption and filing of an Order upon reconsideration with the Commission's Docket Unit.
5. 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.
6. The Executive Director of the Commission shall transmit a copy of this Decision and appropriate accompanying documents as provided by Public Resources Code section 25537 and California Code of Regulations, title 20, section 1768.

Dated: _____

**ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION**

WILLIAM J. KEESE
Chairman

ROBERT A. LAURIE
Commissioner

MICHAL C. MOORE
Commissioner

ROBERT PERNELL
Commissioner

ARTHUR H. ROSENFELD
Commissioner

TABLE OF CONTENTS

	<u>PAGE</u>
INTRODUCTION	1
A. SUMMARY	1
B. SITE CERTIFICATION PROCESS	7
C. PROCEDURAL HISTORY	10
I PROJECT PURPOSE AND DESCRIPTION	13
SUMMARY AND DISCUSSION OF THE EVIDENCE	13
FINDINGS AND CONCLUSIONS	17
II NEED CONFORMANCE	18
III PROJECT ALTERNATIVES	20
SUMMARY AND DISCUSSION OF THE EVIDENCE	20
FINDINGS AND CONCLUSIONS	23
IV .COMPLIANCE AND CLOSURE	25
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	25
FINDINGS AND CONCLUSIONS	26
COMPLIANCE PLAN	27
V. ENGINEERING ASSESSMENT	41
A. FACILITY DESIGN	41
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	41
FINDINGS AND CONCLUSIONS	45
CONDITIONS OF CERTIFICATION	46
B POWER PLANT RELIABILITY	68
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	68
FINDINGS AND CONCLUSIONS	71
C. POWER PLANT EFFICIENCY	72
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	72
FINDINGS AND CONCLUSIONS	74
D. TRANSMISSION SYSTEM ENGINEERING	76
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	77
FINDINGS AND CONCLUSIONS	81
CONDITIONS OF CERTIFICATION	82
E. TRANSMISSION LINE SAFETY AND NUISANCE	85
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	85
FINDINGS AND CONCLUSIONS	88
CONDITIONS OF CERTIFICATION	88

TABLE OF CONTENTS, (Cont.)

	<u>PAGE</u>
VI. PUBLIC HEALTH AND SAFETY	92
A. AIR QUALITY	92
SUMMARY OF THE EVIDENCE	94
FINDINGS AND CONCLUSIONS	120
CONDITIONS OF CERTIFICATION	122
B. PUBLIC HEALTH	137
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	137
FINDINGS AND CONCLUSIONS	142
C. HAZARDOUS MATERIALS MANAGEMENT	144
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	144
FINDINGS AND CONCLUSIONS	147
CONDITIONS OF CERTIFICATION	148
D. WORKER SAFETY AND FIRE PROTECTION	152
SUMMARY OF THE EVIDENCE.....	152
FINDINGS AND CONCLUSIONS	161
CONDITIONS OF CERTIFICATION	162
VII. ENVIRONMENTAL ASSESSMENT	166
A. BIOLOGICAL RESOURCES	166
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	166
FINDINGS AND CONCLUSION	178
CONDITIONS OF CERTIFICATION	179
B. CULTURAL RESOURCES	185
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	186
FINDINGS AND CONCLUSIONS	195
CONDITIONS OF CERTIFICATION	195
C. GEOLOGY AND PALEONTOLOGY	212
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	212
FINDINGS AND CONCLUSIONS	214
CONDITIONS OF CERTIFICATION	215
D. SOIL AND WATER RESOURCES	222
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	222
FINDINGS AND CONCLUSIONS	256
CONDITIONS OF CERTIFICATION	257
E. WASTE MANAGEMENT	259
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	259
FINDINGS AND CONCLUSIONS	267
CONDITIONS OF CERTIFICATION	268

TABLE OF CONTENTS, (Cont.)

	<u>PAGE</u>
VIII LOCAL IMPACT ASSESSMENT	270
A. LAND USE	270
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	270
FINDINGS AND CONCLUSIONS	276
CONDITIONS OF CERTIFICATION	276
B. NOISE	278
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	278
FINDINGS AND CONCLUSIONS	282
CONDITIONS OF CERTIFICATION	283
C. SOCIOECONOMICS	287
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	287
FINDINGS AND CONCLUSIONS	291
CONDITIONS OF CERTIFICATION	293
D. TRAFFIC AND TRANSPORTATION	294
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	294
FINDINGS AND CONCLUSIONS	304
CONDITIONS OF CERTIFICATION	305
E. VISUAL RESOURCES	309
SUMMARY AND DISCUSSION OF THE EVIDENCE.....	309
FINDINGS AND CONCLUSIONS	318
CONDITIONS OF CERTIFICATION	319

APPENDIX A:	LAWS , ORDINANCES , REGULATIONS AND STANDARDS
APPENDIX B:	EXHIBIT LIST
APPENDIX C:	PROOF OF SERVICE LIST
APPENDIX D:	GLOSSARY OF TERMS AND ACRONYMS
APPENDIX E:	STATE WATER RESOURCES CONTROL BOARD — WATER QUALITY CONTROL POLICY (SWRCB 75-58)
APPENDIX F:	WATER CODE (1-4)

INTRODUCTION

A. SUMMARY

This document is the California Energy Commission's (CEC) Revised Presiding Member's Proposed Decision (RPMPD).¹ It contains the CEC Committee's determinations regarding the Application for Certification (AFC) for the Elk Hills Power Project and includes the findings and conclusions required by law. The PMPD is based exclusively on the evidentiary record established at the hearings on the application. The document contains the Committee's reasons supporting its Decision and references to portions of the record, which support the Committee's findings and conclusions.²

The Elk Hills Power Project will be located in western Kern County, California, south of Bakersfield, near the community of Tupman. The proposed project is a 500-megawatt (MW), natural gas-fired, combined cycle project, which will produce electricity for the state electrical grid. The proposed project lies on a 12-acre site at the approximate center of the 74-square mile Elk Hills Oil and Gas Field, from which it proposes to extract locally produced natural gas for fuel. Natural gas will be conveyed to the powerplant site via a new 2,500-foot, 10-inch supply pipeline extending from an existing pipeline.

¹ The requirements for the Presiding Member's Proposed Decision are set forth in the Commission's regulations, Title 20, California Code of Regulations, sections 1749 through 1754. Requirements for the Revised PMPD are found in Title 20, California Code of Regulations, section 1753. The Final Decision is described in Section 1755.

² References to the evidentiary record, which appear in parentheses following the referenced material, may include an exhibit number and/or a reference to the date, page and line number(s) of the reporter's transcript e.g., (Ex. 2, p. 55; 1/20 RT 123:8-124:3.) Because all evidentiary hearings were conducted in 2000, the year reference has been omitted from the citation to the record.

Access to the site from Bakersfield is provided by traveling south on State Highway 99 to State Route (SR) 119 west, to Elk Hills Road north to the site. Elk Hills Road is a county road, which runs north/south through the entire Elk Hills Oil and Gas Field, and forms the eastern boundary of the powerplant site. The site's southern boundary is formed where Elk Hills Road intersects with Skyline Road, a private road, which runs east/west just south of the proposed site.

Aside from Elk Hills Road, the Elk Hills Oil and Gas Field is generally closed to public access. All access to the oil field is under highly controlled conditions with guards in guard stations and in mobile security units.

The proposed project will include a new 230 kV switchyard and a new 8.6 or 9.0 mile 230 kV transmission line interconnect to Pacific Gas & Electric's (PG&E) regional transmission system. Either interconnect will occur south of, or at PG&E's Midway substation at Buttonwillow (Line 1B), which is nine miles north of the proposed site. Applicant has proposed several alternate transmission line routes (Lines 1A, 1B and 1B Variation) with the intent that all three routes be approved.³

Applicant will contract with the West Kern Water District (WKWD) to supply all of the project's water needs exclusively. The proposed project's water supply needs are approximately 3,180-acre feet per year (AFY).⁴ The water would be pumped via a new 9.8 mile, 16-inch supply line from WKWD's groundwater well field in the Tupman area. This identical groundwater is the supply source for all of WKWD's residential and industrial customers.

³ We use the term Applicant generically to refer to the proposed project.

⁴ Applicant has identified no backup source of water to supply the water needs of the powerplant.

Applicant plans to begin a 14 to 16 month construction period immediately after certification. The construction workforce, for the most part, will be drawn from Bakersfield and surrounding communities. Overall, when secondary jobs are included, the Elk Hills Power Project will create the equivalent of 785 construction-related jobs and 58 operations-related jobs. There will be a peak work force of approximately 350 construction jobs and about 20 permanent personnel to operate the facility.

The payroll over the project's 15-month construction period will be approximately \$43 million, and the operation payroll will be about \$2 million per year for the project's 30-year operational life. The bulk of the payroll will likely be spent in the area's communities. The evidence indicates that \$25 million worth of materials and equipment will be purchased locally during construction activities. Another \$3 million will be spent locally each year for operating supplies.

We find that Applicant, in light of its October 2000 Joint Statement with the California Unions for Reliable Energy (CURE), has carried its burden of proof on all outstanding issues.⁵ (Joint Ex. 1; 10/26 RT 7:18-8:2.)

For example, in the Air Quality section, CURE originally sought a finding by the Committee that would require Applicant to apply the SCONox technology as best available control technology (BACT). Although we have declined to do so, the Joint Agreement reflects a bilateral provision solely between Applicant and CURE to explore a refinement of the SCR technology that Applicant will apply to the proposed project. The record now demonstrates that CURE has fully

⁵ Herein, we refer to the Joint Statement as the Joint Agreement because it clearly memorializes the parties' accord on the remaining critical issue of water supply. In addition, Applicant and CURE have presented joint recommendations for revision of Conditions on the topics of Hazardous Materials Management, Traffic and Transportation and Worker Safety. These changes are proposed to effectuate Applicant's switch to aqueous rather than anhydrous ammonia. (RT 10:7-12-18; see Joint, Ex. 2.)

acquiesced in our conclusion that SCONOx is not yet a proven technology for the source and type of engineering Applicant plans to employ. (Joint Ex. 1; 10/26 RT 7:18-8:2.)

Applicant plans to employ carbon monoxide (CO) oxidation catalyst as part of its pollution control package. (See Joint Ex. 1.) Moreover, to ensure adequate mitigation of emissions during project construction, Applicant has agreed to employ oxidizing soot filters and ignition-timing devices on construction equipment wherever feasible. (See Condition **AQ-C2**; **Joint Ex. 1**.)

On the topic of public health, we agree with the approach taken by Applicant and Staff, but opposed by CURE, regarding the definition of offsite workers. In particular CURE contends that those workers in the adjacent Elk Hills Oil and Gas Field are conducting work sufficiently related to that of the proposed project to require protection by existing Occupational Safety and Health Administration (OSHA) industrial standards.

While we seriously considered CURE s arguments concerning potential risks from acrolein emissions during construction, we found that the use of oxidizing soot filters will adequately mitigate any potential risks from acrolein and other emissions. CURE has stated that implementation of this requirement would alleviate their concerns.

Applicant s Project Construction Safety and Health Program shall include provision for a project Health and Safety Officer, (HSO) who will be identified and assigned to the site on a full-time basis.⁶ The HSO will be responsible for

⁶ Joint Exhibit 1 contains a proposal by Applicant and CURE to modify Safety-1 to provide for a Registered Environmental Assessor Class II (REA). We have adopted this proposal in our Worker Safety Conditions of Certification. Likewise, we have adopted the recommendation contained in Joint 1 that requires the REA to perform a records review and field study to confirm that no contaminated sites will be encountered during construction of the project.

assessing potential hazards to workers if crude-oil impacted soil is encountered during grading and excavation activities being performed at the site. The HSO will have available, real-time air monitoring equipment (photoionization detector [PID] and flame ionization detector [FID] and a real time air borne particulate monitor to use to evaluate potential airborne chemical hazards. (Condition **SAFETY-1.**)

Joint Exhibit 1 will require Applicant to employ aqueous ammonia rather than anhydrous ammonia. (Joint Ex. 1; 10/26 RT 14:21-16:25; Condition **HAZ-5.**) Staff found that Applicant's use of aqueous ammonia was a major risk reduction and that the change to aqueous ammonia virtually precludes the probability of offsite impacts. (10/26 RT 15:22-16:2.)

We are therefore persuaded that, with the provisions of Joint Exhibit 1 related to Applicant's use of aqueous ammonia, the risks associated with handling and transportation of ammonia will be insignificant. (See **HAZ-5 & 6; TRANS-9;** 10/26 RT 15:16-16:13.)

Finally, CURE has abandoned its position that the Commission must apply State Water Resources Control Board Resolution 75-58 (SWRCBR 75-58) to Applicant's use of WKWD groundwater. (Joint Ex. 1.) We previously determined that SWRCBR 75-58 has no binding application to water use because, on its face, SWRCBR 75-58 applies to surface or fresh inland waters, which it defines in the conjunctive, as water, which must be both:

- suitable for a source of domestic, municipal, or agricultural water supply, **and**
- provide habitat for fish and wildlife.

We found that water supplied by WKWD does not fit this description.

On the question of the Water Code section 13550,⁷ Applicant has met its burden to show that the statute does not preclude it from utilizing WKWD groundwater. We may assume Staff's position to be correct that WKWD water is potable domestic water within the meaning of the mandatory reuse provisions of the Water Code. (Ex. 19E, p. 1.) Even so, Applicant and Staff have demonstrated first that recycled water is unavailable absent a cost to the Applicant beyond what the mandatory reuse provisions of the Water Code require. (10/26 RT 26:12-45:3; Exs. 46-47; See Applicant's and Staff's Briefs on applicability of the mandatory reuse provisions of the Water Code.)

⁷ As does the Applicant, we will refer herein to Water Code, / 13550 et seq. as the mandatory reuse provisions of the Water Code. (10/26 RT 35:6-38:11.)

B. SITE CERTIFICATION PROCESS

The Elk Hills Power Project and its related facilities fall within Energy Commission licensing jurisdiction. (Pub. Resources Code, // 25500 et seq.) During its licensing proceedings, the Commission acts as lead state agency under the California Environmental Quality Act (CEQA). (Pub. Resources Code, // 25519 (c), 21000 et seq.) The Commission's process and associated documents are functionally equivalent to the preparation of the traditional Environmental Impact Report. (Pub. Resources Code, /21080.5.)

The Commission's process is designed to allow the review of a project to be completed within a limited period; a license issued by the Commission is in lieu of other state and local permits. The Commission's certification process provides a thorough and timely review and analysis of all aspects of this proposed project. During the process, we conduct a comprehensive examination of a project's potential economic, public health and safety, reliability, engineering, and environmental ramifications.

Significantly, the Commission's process allows for and encourages public participation so that members of the public may become involved either informally, or on a more formal level as an Intervenor with the same legal rights and duties as the project developers. Public participation is encouraged at every stage of the process.

The process begins when an applicant submits the Application for Certification (AFC). Commission staff reviews the data submitted as part of this AFC, and recommends to the Commission whether or not it contains adequate information to permit review to commence. Once the Commission determines that an AFC contains sufficient analytic information, it appoints a Committee of two Commissioners to conduct the licensing process. The Commission also appoints

a hearing officer to provide legal assistance to the Committee in each case. This process includes holding public conferences and evidentiary hearings, as well as providing a recommendation to the full Commission concerning a project's ultimate acceptability. The Committee and ultimately the Commission serve as fact-finder and decision-maker.

The Commission has a Public Advisor. The role of the Commission's Public Advisor is to assist members of the public and intervenors with their understanding of and participation in the Commission's siting process.

Only CURE was granted status as a full-party Intervenor. The San Luis Obispo County Air Pollution Control District (SLOCAPCD) was granted status as a limited Intervenor, which entails the right to comment and brief areas of special interest. SLOCAPCD did not, however, actively participate in the proceedings.

All parties, including the applicant, Commission staff, and any intervenors, are subject to the *ex parte* rule, which prohibits them from communicating on substantive matters with Committee members, their staffs, and the hearing officer, except for communications which are on the public record.

The initial portion of the certification process is weighted heavily toward assuring public awareness of the proposed project and obtaining such further technical information as is necessary. During this time, the Commission staff sponsors numerous public workshops at which intervenors, agency representatives, members of the public, Staff, and Applicant meet to evaluate and resolve pertinent issues. Staff then publicizes its initial technical evaluation of the project in the document called the Preliminary Staff Assessment (PSA).

Following this, the Committee conducts a Prehearing Conference to assess the adequacy of the available information, identify issues, and determine the

positions of the various participants. Information obtained from this event form the basis for a Hearing Order organizing and scheduling formal evidentiary hearings. These hearings are conducted after Staff has finalized its analytical technical evaluation of the project in the document called the Final Staff Assessment (FSA).

At the evidentiary hearings following the FSA s release, all participants that have become formal parties are able to present testimony, under oath or affirmation, which is subject to cross-examination by other parties and to questioning by the Committee. The public may also comment on the proposed project at these hearings. Evidence and public comment adduced during these hearings provides the basis for the decision-makers analysis.

This analysis appears in a Committee recommendation to the full Commission in the form of a Presiding Member s Proposed Decision, which is available for a public review period of at least 30 days. Depending upon the extent of revision necessary in reaction to comments received during this period, the Committee may then elect to publish a revised version. If so, this latter document triggers an additional 15-day public comment period. Finally, the full Commission decides whether to accept, reject, or modify the Committee s recommendations at a public hearing.

C. PROCEDURAL HISTORY

The Public Resources Code and the Commission's regulations mandate a public process and specify the occurrence of certain necessary events. (Pub. Resources Code, §§ 25500 et seq.; Cal. Code of Regs., tit. 20, §§ 1701, et seq.)

The essential procedural elements occurring during the present case are summarized below.

The Applicant submitted its Application for Certification (AFC) on February 24, 1999. Shortly thereafter, Staff sent a request for agency participation to those governmental agencies likely to have an interest in the project. On June 9, 1999, the full Commission determined that the Applicant had made its AFC sufficiently informative and complete to commence the review process.

The Committee scheduled its initial event, an Informational Hearing and Site Visit, by Notice dated June 18, 1999. This notice was sent to all known to be interested in the proposed project, including owners of land adjacent to, or in the near vicinity of, the Elk Hills project; it was also published in local general circulation newspapers.

The Committee conducted the Informational Hearing in the community of Derby Acres on July 12, 1999. At this event, Applicant hosted a visit to the proposed power plant site and along the proposed transmission line route. Following the site visit, the Committee and other participants discussed the proposed Elk Hills Power Project, described the Energy Commission's review process, and identified opportunities for public participation. The Committee issued its required Scheduling Order on July 27, 1999.

Staff released its PSA on November 19, 1999, and conducted various workshops to receive comments on the PSA. Scheduled by Notice dated November 22,

1999, the Committee held a Prehearing Conference on December 16, 1999. At the Prehearing Conference, the parties and the Committee addressed issues of special concern to the parties. Also discussed were special concerns the Committee had regarding conduct of the evidentiary proceedings.

Evidentiary hearings were scheduled by Notice of Evidentiary Hearings dated December 22, 1999. Thereafter, on January 6, 2000, Staff issued its first in a series of Final Staff Analyses covering 17 technical areas.⁸ The Committee subsequently conducted evidentiary hearings on these technical areas in January and February 2000.

On February 18, Staff filed its FSA, Part II, covering the technical areas of Biological and Soil and Water Resources. The Committee subsequently scheduled and conducted evidentiary hearings on these technical areas on March 9 and May 2, 2000.

Finally, Staff issued its FSA, Part 3, on April 28, 2000, covering the technical areas of Air Quality and Alternatives. Evidentiary hearings were scheduled, with a single hearing conducted on these technical areas on May 16, 2000. After receipt of the parties' briefs in these areas, the evidentiary record was closed in June 2000.

The Committee after reviewing and compiling the evidentiary record published this Presiding Member's Proposed Decision (PMPD) on August 25, 2000. A combined Committee Conference and Evidentiary Hearing on water supply

⁸ **Part 1** of the FSA contains the following sections: Cultural Resources; Facility Design; General Conditions/Compliance; Geology and Paleontology; Hazardous Materials Management; Land Use; Need Conformance; Noise; Project Description; Power Plant Reliability; Power Plant Efficiency; Public Health; Socioeconomics; Traffic and Transportation; Transmission Line Safety and Nuisance; Transmission System Engineering; Visual Resources; Waste Management; and Worker Safety and Fire Protection.

issues was conducted on October 26, 2000. Because of substantial modifications to the PMPD, the Committee has elected to issue this Revised PMPD. Accordingly, the parties will have an additional 15-day comment period in which to address any concerns to the Committee. Thereafter, the Commission will issue its decision on the Elk Hills Power Project.

I. PROJECT PURPOSE AND DESCRIPTION

SUMMARY AND DISCUSSION OF THE EVIDENCE

The project Applicant is Elk Hills Power, LLC (Elk Hills, or Applicant), a Delaware Limited Liability Company, which is a subsidiary of Sempra Energy Resources and Occidental Energy Ventures Corp. Applicant plans to construct and operate the Elk Hills Power Project, a nominal 500-megawatt (MW) natural gas-fired, combined cycle powerplant. Applicant's objective is to utilize locally produced natural gas from the Elk Hills Oil and Gas Field to produce electrical energy for sale in California's newly deregulated electricity market. Applicant will lease the site, which is owned by Occidental of Elk Hills Incorporated (OEHI). (Ex. 1, section 1.1; 1/20/00 RT 19:23.)

The powerplant site is located in Kern County, approximately 25 miles west of Bakersfield, between the communities of Buttonwillow (9 miles north) and Taft (9 miles south). (Ex. 19, pp. 1, 11.)⁹ The 12-acre site is a part of the 74 square mile (47,000 acre) Elk Hills Oil and Gas Field, formally the Elk Hills Naval Petroleum Reserve Number 1 (NPR1). (*Id.*; 1/20 RT 13:24-14:1; see **Figure 1** below.)

OEHI purchased NPR1 from the U.S. in February 1998--until that time, from the early 1900s, NPR1 had been operated as a naval oil reserve. (Ex. 19, p. 3.) OEHI currently operates 35R, a 45-MW cogeneration powerplant near the proposed site. (Ex. 19, p. 3.) 35R was constructed in 1994 during U.S. ownership to supply the electrical power, heat and steam needs to the Elk Hills Oil and Gas Field.

⁹ These proceedings were conducted in January-March and May 2000, in three phases. (Ex. 19, p. 3.) Citations to the Final Staff Analysis (FSA, Exhibit 19) will reflect those phases as follows. Ex. 19 refers to those FSA sections, which deal with the January and February hearings, which covered most of our topics. Ex. 19A-C, Part II, refers to those FSA sections, which deal with the March 9 and May 2 hearings on the topics of Biological and Soil and Water Resources. Finally, Ex. 19D, Part III, refers to those FSA sections that deal with the topics of Air Quality and Alternatives. A single hearing on these topics was concluded on May 16.

The vicinity is heavily developed and utilized by petroleum companies for natural gas and oil production. (1/20 RT 17:4-7.) The site is presently occupied by out-of-service tanks and equipment formerly used for storage and loading of propane, butane, and natural gas liquid products. (1/20 RT 16:23-17:1; Ex. 1, p. 1-3.)

The 500 MW combined cycle project will consist of:

- Two General Electric Frame 7FA combustion turbine generators (CTGs);
- Two Heat Recovery Steam Generators (HRSGs);
- One six cell cooling tower; and
- One shared 171 MW Steam Turbine Generator (STG)

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PROJECT DESCRIPTION Figure 1

Elk Hills Power Project — Regional Setting

Source: Ex. 19, p. 12

Each CTG will be equipped with dry low-NO_x (oxides of nitrogen) combustors, evaporative inlet air coolers, and steam injection power augmentation. The HRSGs will be equipped with fixed bed aqueous ammonia type selective catalytic reduction (SCR) and oxidizing catalysts for emissions control, and duct burners.

Each CTG system will generate 166 MW under design ambient conditions with steam power augmentation from the duct burners, and 153 MW without steam augmentation. The STG will generate 171 MW under design ambient conditions with or without augmentation. Exhaust gas from each CTG will flow directly through a HRSG equipped with an SCR, before passing through an exhaust stack. (Ex. 1, p. 3-15.) OEHI will provide natural gas, which will be the only fuel used at the facility. (Ex. 19, p. 14.) The fuel will be supplied via a 0.5-mile long, 10-inch diameter gas pipeline from OEHI s existing main natural gas pipeline. (*Ibid.*)

Power will be generated by the two CTGs and the STG at 13.8 kilovolt (kV) and stepped up by two transformers to 230 kV for delivery to the powerplant s interconnection to PG&E. (Ex. 19, p. 14.) Two 230 kV transmission line alternatives, Routes 1A and 1B, are being considered to interconnect the powerplant to the California electric transmission grid. (Ex. 19, p. 14.) In addition, Applicant has proposed the Route 1B Variation, which generally follows the contours of Route 1B, with some minor modifications. For reasons of flexibility, Applicant desires certification of all three transmission line options. (*Ibid.*)

Applicant proposes to draw its water supply from the WKWD via a new 9.8-mile long, 16-inch steel pipeline extending from WKWD s existing facilities east of the proposed powerplant site and adjacent to SR 119. The first 4.1 miles of the raw water supply pipeline would be placed underground alongside existing underground pipelines. Of these 4.1 miles, 0.7 miles of pipeline crosses the Coles Levee Ecosystem Preserve and 0.5 miles crosses federal Bureau of Land

Management (BLM) lands. (Ex. 19, p. 3.) The remainder of the pipeline is on Elk Hills Oil and Gas Field property and features aboveground mounting on pipe supports for the last 5.7 miles. (*Ibid.*)

Applicant proposes to dispose of wastewater in two disposal wells (one backup) located about four miles south of the powerplant site. (Ex. 19, p. 3.)

FINDINGS AND CONCLUSIONS

Based upon the evidence of record, we find as follows:

1. The project objective is to construct and operate a nominally rated 500 MW natural gas-fired combined cycle merchant power plant.
2. The project consists of the electrical power generation equipment, the transmission interconnection, the raw and potable water supply lines, the natural gas pipeline, and appurtenant facilities.

II. NEED CONFORMANCE

The Commission accepted the Elk Hills Power Project Application for Certification on June 9, 1999. At that time, the Public Resources Code prohibited the Energy Commission from certifying a power plant unless the Commission made a finding that the facility was "needed" in accordance with the Commission's integrated assessment of need for new resource additions. (See Pub. Resources Code, §§ 25523(f) and 25524(a).)

The Public Resources Code directed the Commission to do:

- an "integrated assessment of need," taking into account,
- 5- and 12-year forecasts of electricity supply and demand as well as,
- various competing interests, and
- to adopt the assessment in biennial electricity report.

On September 28, 1999, the Governor signed Senate Bill No. 110, which became Chapter 581, Statutes of 1999. This legislation repeals Public Resources Code sections 25523(f) and 25524(a), and amends other provisions relating to the assessment of need for new resources. It thereby removes the requirement that, to certify a proposed facility, the Commission must make a specific finding that the proposed facility is in conformance with the adopted integrated assessment of need. Regarding need-determination, Senate Bill 110 states:

Before the California electricity industry was restructured the regulated cost recovery framework for powerplants justified requiring the commission to determine the need for new generation, and site only powerplants for which need was established. Now that powerplant owners are at risk to recover their investments, it is no longer appropriate to make this determination. (Pub. Resources Code, § 25009, added by Stats. 1999, ch. 581, § 1.)

Senate Bill 110 took effect on January 1, 2000. (Cal. Const., Art. 4, /8.) As of that date, the Energy Commission is no longer required to determine if a proposed project conforms with an integrated assessment of need. As a result, any application for certification for which the Commission adopts a final decision after January 1, 2000, is not subject to a finding of "need conformance."

In this case, the Commission's final decision will be made after January 1, 2000. Therefore, because of SB 110, the Commission makes no finding of "need conformance" with respect to the proposed project. (1/20 RT 39:11-21.)

III. PROJECT ALTERNATIVES

The Commission is required during the AFC process to examine the feasibility of site and facility alternatives that may avoid or lessen the potential significant environmental impacts of a proposed project. (Pub. Resources Code, / 21080.5(b)(3)(A); Cal. Code of Regs., tit. 20,/1765.) Although Applicant's AFC was not required to contain a discussion of site alternatives, the Commission's CEQA duty remained unchanged. (See Pub. Resources Code, /25540.6 (b).) Therefore, this Decision complies "with the CEQA guidelines , which require:

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 , as well as an evaluation of the no project alternative. (14 CCR,/15126 (d).)

The range of alternatives that we are required to consider is governed by a rule of reason . This means that our consideration of alternatives may be limited only to those:

that would avoid or substantially lessen any of the significant effects while continuing to attain most of the basic objectives of the project, and need not include those alternatives whose effects cannot be reasonably ascertained and whose implementation is remote and speculative. (14 CCR,/15126 (d) (5); Ex. 19D, Part III, p. 7.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

The evidence of record addresses alternatives to the major components of the Elk Hills project. (5/16/00 RT 339:10-346:17; Ex. 19D, Part III, pp. 5-13.) This includes generation technology, site selection, and linear facility routing. (*Ibid.*)

The methodology used to prepare the alternatives analysis includes:

- Identifying the basic objectives of the project;
- Providing an overview of the project s potentially significant adverse impacts;

- Identifying and evaluating alternatives to the project;
- Identifying and evaluating alternative locations for sites; and
- Evaluating the impacts of not constructing the project. (Ex. 19D, Part III, p. 1.)

1. Project Objectives

The evidence presented by both Applicant and Staff indicates that the objectives of the Elk Hills project include the following:

- Build and operate a combined cycle, natural gas-fueled facility in utilizing locally-produced natural gas from the Elk Hills Oil and Gas Field in western Kern County, California that would produce economic, reliable, and environmentally sound electrical energy and ancillary services for California's restructured power market;
- Generate approximately 500 megawatts of electricity, which will be sold in the California electricity market through the California Independent System Operator (Cal-ISO). (Ex. 1; p. 3-73.)

To achieve these ends, the project proponents desire to construct the Elk Hills Power Project near essential infrastructure such as transmission lines, supplies of process water and of natural gas. (Ex. 1; pp. 3-74.) The proposed project's location in the center of the Elk Hills Oil and Gas Field serves these purposes because the industrial infrastructure to support the project is already in place. (*Ibid.*)

2. Potentially Significant Adverse Impacts

The environmental impacts of the project are discussed in detail in the individual topic areas of this Decision. However, for the purposes of conducting its alternatives analysis, Staff assumed that the project would pose potentially significant adverse impacts in the areas of air quality and biological resources, if not adequately mitigated. (Ex. 19D, Part III, p. 5.) The Applicant's ability to mitigate such impacts to levels of insignificance is discussed under those respective topics.

3. Technological Alternatives

Staff compared various alternative technologies with the proposed project, scaled to meet the project's objectives. Technologies examined were those principal electricity generation technologies that do not burn fossil fuels such as natural gas, solar, and wind. Each of these technologies could be attractive from an environmental perspective because of the absence or reduced level of air pollutants. (Ex. 19D, Part III, p. 5.) Staff found, however, that each alternative examined was inappropriate when scaled to the production capabilities of the proposed project. (*Ibid.*)

4. Alternative Locations

The evidence indicates that Commission staff evaluated three alternative locations that met the project objective of efficiently providing electrical power utilizing locally produced natural gas from the Elk Hills Oil and Gas Field. (Ex. 19D, Part III, pp. 6-7.)

These alternative sites were all in close proximity to the proposed site. (Ex. 19D, Part III, pp. 6-7.) Each site was found deficient in some important locational or environmental aspect to the proposed project. (*Ibid.*) The analysis of each of these alternatives is detailed in the evidence of record, and indicates that industrial development at these sites is either infeasible or would result in potentially greater environmental impacts than the proposed project. (*Ibid.*)

The evidence also includes an evaluation of alternative routings for the project's transmission tie line. (Ex. 19D, pp. 9-10.) The alternatives were proposed as part of the project and are analyzed in the topic section on Transmission System Engineering.

5. No Project

Applicant's analysis in the AFC and Staff's no project analysis in the FSA both conclude that, assuming all project-related environmental impacts are mitigated to a level of insignificance, the no project alternative is not superior to the proposed project. (Exs. 1, pp. 3-73/74; 19D, pp. 11-13.) Applicant and Staff based their determination, *inter alia*, on the project's service to California's need for a substantial amount of additional generation capacity. (*Ibid.*)

FINDINGS AND CONCLUSIONS

Based upon the totality of the evidence of record, including that relating to each topic area contained in other portions of this Decision, we find and conclude as follows:

1. The evidence of record contains an acceptable analysis of a reasonable range of alternatives to the project as proposed.
2. The evidentiary record contains a review of alternative technologies, fuels, linear routings, and the no project alternative.
3. If all Conditions of Certification contained in this Decision are implemented, construction and operation of the Elk Hills Power Project will not create any direct, indirect, or cumulative significant adverse environmental impacts.
4. No alternative to the project considered by the Commission, including but not limited to the 'no project' alternative, would avoid or lessen any direct, or indirect, or cumulative significant adverse environmental impacts of the Elk Hills project, because as mitigated the Elk Hills project will not cause any such impacts.
5. No alternative to the project considered by the Commission, including but not limited to the 'no project' alternative, is feasible, because none are capable of meeting the key project objective, which is to provide efficient electrical power utilizing locally produced natural gas from the Elk Hills Oil and Gas Field.

We therefore conclude that the evidence of record contains an analysis of possible alternatives to the Elk Hills Power Project, including its appurtenant facilities, which satisfies the requirements of both the Warren-Alquist Act and the California Environmental Quality Act and implementing regulations.

IV. 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 AND DISCUSSION OF THE EVIDENCE

The evidence of 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 Elk Hills Power 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 is the "General Conditions". These General Conditions:

- 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;
- Establish procedures for settling disputes and making post-certification changes;
- State the requirements for periodic compliance reports and other administrative procedures necessary to verify the compliance status of all Commission imposed conditions; and

- Establish 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 an insignificant level. 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 read in conjunction with any additional requirements contained in the individual Conditions of Certification.

FINDINGS AND CONCLUSIONS

The evidence of record establishes:

1. The Compliance Plan and the specific Conditions of Certification contained in this Decision assure that the Elk Hills Power Project will be designed, constructed, operated, and closed in conformity with applicable law.
2. Requirements contained in the Compliance Plan and in the specific Conditions of Certification are intended to be read in conjunction with one another.

We therefore conclude that the compliance and monitoring provisions incorporated as a part of this Decision satisfy the requirements of Public Resources Code section 25532. Furthermore, we adopt the following Compliance Plan as part of this Decision.

COMPLIANCE PLAN

GENERAL CONDITIONS OF CERTIFICATION

COMPLIANCE PROJECT MANAGER (CPM) RESPONSIBILITIES

A CPM will oversee the compliance monitoring and shall be responsible for:

1. Ensuring that the design, construction, operation, and closure of the project facilities is in compliance with the terms and conditions of the Commission Decision;
2. Resolving complaints;
3. Processing post-certification changes to the conditions of certification, project description, and ownership or operational control;
4. Documenting and tracking compliance filings; and,
5. Ensuring that the compliance files are maintained and accessible.

The CPM is the contact person for the Commission and will consult with appropriate responsible agencies and the Commission 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, it should be understood that the approval would involve all appropriate staff and management.

The Commission has established a toll free 800 number for the public to use for notifying the Commission about power plant construction and operation related complaints or events of concern. The telephone number is **1-800-858-0784**.

Pre-Construction and Pre-Operation Compliance Meeting

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements contained in the Commission's Conditions of Certification to confirm that they have been met or, if they have not been met, to ensure that the proper action is taken. In addition, these meetings shall ensure, to the extent possible, that Commission conditions will not delay the construction and operation of the plant due to oversight or inadvertence and to preclude any last minute, unforeseen issues from arising.

Commission Record

The Commission shall maintain as a public record in either the Compliance file or Docket file for the life of the project (or other period as required):

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

PROJECT OWNER RESPONSIBILITIES

It is the responsibility of the project owner and any successors in interest to ensure that the general compliance conditions and the Conditions of Certification are satisfied. The general compliance conditions regarding post-certification changes specify measures that the project owner and any successors in interest must take when requesting changes in the project design, compliance conditions, or ownership. Failure to comply with any of the Conditions of Certification or the general compliance conditions may result in revocation of Commission certification, an administrative fine, or other action as appropriate.

Access

The CPM, designated staff, and delegated agencies or consultants, shall be guaranteed and granted 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.

Compliance Record

The project owner shall maintain project files on-site or at an alternative site approved by the CPM, for the life of the project. The files shall contain copies of all as-built drawings, all documents submitted as verification for conditions, and all other project-related documents for the life of the project, unless a lesser period is specified by the Conditions of Certification.

Commission staff and delegate agencies shall, upon request to the project owner, be given access to the files.

Compliance Verifications

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 involved condition(s) of certification by condition number and include 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.

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 submittals shall be addressed as follows:

**Compliance Project Manager
Elk Hills Power Project (99-AFC-1)
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814**

If the project owner desires Commission staff action by a specific date, it shall so state in its submittal and include a detailed explanation of the effects on the project if this date is not met.

Each Condition of Certification is followed by a means of verification. The verification describes the 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, in most cases without Commission approval. [See Title 20, California Code of Regulations, 1760.]

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

- 1) Reporting on the work done and providing the pertinent documentation in monthly and/or annual compliance reports filed by the project owner or authorized agent as required by the specific Conditions of Certification;
- 2) Appropriate letters from delegate agencies verifying compliance;
- 3) Commission staff audit of project records; and/or
- 4) Commission staff inspection of mitigation and/or other evidence of mitigation.

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 Commission Decision. During construction, the project owner or authorized agent shall 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 compliance reports.

Compliance Matrix

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 compliance conditions 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., sixty (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) An indication of the compliance status for each condition (e.g., not started , in progress or completed date).

Completed or satisfied conditions do not need to be included in the compliance matrix after they have been identified as completed/satisfied in at least one monthly or annual compliance report.

Monthly Compliance Report

During construction of the project, the project owner or authorized agent shall submit Monthly Compliance Reports 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, and should be submitted as attachments to the Monthly Compliance Report;
- 3) An initial, and thereafter updated, compliance matrix which shows the status of all Conditions of Certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);

- 4) A list of conditions which have been satisfied during the reporting period, and a description or reference to the actions which 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 with, or permits issued by, other governmental agencies during the month;
- 8) A projection of project compliance activities scheduled during the next two months;
- 9) A listing of the month's additions to the on-site compliance file; and
- 10) Any requests to dispose of items that are required to be maintained in the project owner's compliance file.

The first Monthly Compliance Report is due the month following the Commission business meeting date that the project was approved, unless the project owner notifies the CPM in writing that a delay is warranted. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the Key Events List. (The Key Events List is located at the end of this section.)

Annual Compliance Report

After the air district has issued a Permit to Operate, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The Permit to Operate is issued following the satisfactory completion of the required source test.

The annual reports are for each year of commercial operation and are due to the CPM each year on a date designated 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 identify the reporting period and shall contain the following:

- 1) An updated compliance matrix which shows the status of all Conditions of Certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
- 2) A summary of the current project operating status and an explanation of any significant changes to facility operations during the year (e.g., total hours of operation, scheduled and unscheduled maintenance and any major repairs);
- 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, and should be submitted as attachments to the Annual Compliance Report;

- 4) A cumulative listing of all post-certification changes approved by the 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 made 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, and
- 9) An evaluation of the on-site contingency plan for unexpected facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section].

Confidential Information

Any information deemed confidential by the project owner shall be submitted to the Commission s Docket with an application for confidentiality pursuant to Title 20, California Code of Regulations, / 2505(a). Any information determined to be confidential shall be kept confidential as provided for in Title 20, California Code of Regulations,/2501 et seq .

Department of Fish and Game Filing Fee

Pursuant to the provisions of Fish and Game Code,/711.4, the project owner shall pay a filing fee in the amount of eight hundred and fifty dollars (\$850) to the Department of Fish and Game. The payment instrument shall be provided to the Commission s Project Manager at the time of project certification and shall be made payable to the California Department of Fish and Game. The Commission s Project Manager will submit the payment to the Office of Planning and Research as payment to the Secretary of the Resources Agency at the time of filing of the notice of decision pursuant to Public Resources Code,/21080.5.

FACILITY CLOSURE

Introduction

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

which provide the flexibility to deal with the specific situation and project setting which will 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, unexpected temporary closure and unexpected permanent closure.

Planned Closure

This planned closure occurs at the end of a project's life, 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.

Unexpected Temporary Closure

This unplanned 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.

Unexpected Permanent Closure

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

General Conditions for Facility Closure

Planned Closure

In order that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options, 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 Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the CPM). 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 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 all facilities and equipment that will a) be immediately removed from the site after closure (e.g., hazardous materials); b) temporarily remain on the site after closure (e.g., until the item is sold or scrapped); and c) permanently remain on the site after closure. The plan must explain both why the item cannot be removed and why it does not present a risk of harm to the environment and the public health and safety to remain *in situ* for an indefinite period.
4. Address conformance of the plan with all applicable laws, ordinances, regulations, standards, local/regional plans in existence at the time of facility closure, and applicable Conditions of Certification.

Workshops and/or hearings may be conducted as part of the Commission's approval procedure if there are significant issues associated with the proposed facility closure plan, or the desires of local officials or interested parties are inconsistent with the plan.

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

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 or the environment, but shall not commence any other closure activities, until Commission approval of the facility closure plan is obtained.

Unexpected Temporary Closure

In order to ensure that public health and safety and the environment are protected in the event of an unexpected 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, 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 sixty (60) days (or other time agreed to by the CPM) before commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facilities and shall be kept at the site at all times.

The project owner, in consultation with the CPM, shall update the on-site contingency plan as necessary. The CPM may recommend revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Commission, the project owner shall 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 and encroachment. In addition, for temporary 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.

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

In the event of an unexpected temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, and 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 circumstances and the expected duration of the closure.

If a temporary closure is likely to be permanent, or of a duration of more than twelve months, a closure plan consistent with that for a planned closure shall be submitted to the CPM within 90 days of the determination. The CPM and project owner may agree to a period of time other than 90 days.

Unexpected Permanent Closure

In order to ensure that public health and safety and the environment are protected in the event of an unexpected permanent facility closure, it is essential to have an on-site contingency plan in place for unexpected permanent closure. This may be a part of the on-site contingency plan for unexpected temporary closure. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety, and environmental impacts, are taken in a timely manner (even in an unlikely abandonment scenario).

The project owner shall submit the on-site contingency plan for CPM review and approval. The plan shall be submitted no less than sixty (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 facilities and shall be kept at the site at all times.

The project owner, in consultation with the CPM, shall update the on-site contingency plan as necessary. The CPM may recommend revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Commission, the project owner shall 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 and encroachment. In addition, 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.

Furthermore, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully completed in the event of abandonment. 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 unexpected permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, and e-mail, within twenty-four (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.

DELEGATE AGENCIES

To the extent permitted by law, the Commission may delegate authority for compliance verification and enforcement to various state and local agencies that have expertise in subject areas where specific requirements have been established as a Condition of Certification. If a delegate agency does not participate in this program, the Commission staff will establish an alternative method of verification and enforcement. The Commission reserves the right to direct Staff to independently verify compliance.

In performing construction and operation monitoring of the project, the Commission staff acts as, and has the authority of, the Chief Building Official (CBO). The Commission staff retains this authority when delegating to a local CBO. Delegation of authority for compliance verification includes the authority for enforcing codes, the responsibility for code interpretation as necessary, and the authority to use discretion as necessary in implementing the various codes and standards.

Whenever an agency's responsibility for a particular area is transferred by law to another entity, all references to the original agency shall be interpreted to apply to the successor entity.

ENFORCEMENT

The Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code, // 25534 and 25900. The 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 Commission Decision.

Moreover, to ensure compliance with the terms and Conditions of Certification and applicable laws, ordinances, regulations, and standards, delegate agencies are authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

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 Commission pursuant to Title 20, California Code of Regulations, /1230 et seq., but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure are described below:

Informal Dispute Resolution Procedure

The following procedure is designed to informally resolve disputes concerning the interpretation of this compliance plan. The project owner, the Commission, or any other party, including members of the public, may initiate this procedure for resolving a dispute. Disputes may pertain to actions, inactions or decisions made by any party, including the Commission's delegate agents.

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, /1230 et seq., 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 Commission, although the agreed upon resolution may result in a project owner, or in some cases the Commission staff, proposing an amendment.

The procedure 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 referred to the full Commission for consideration via the complaint and investigation process. The procedure for informal dispute resolution is as follows:

Request for Informal Investigation

Any individual, group, or agency may request the Commission to conduct an informal investigation of alleged noncompliance with the 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 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 required to promptly investigate the matter and, within seven (7) 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 provide an initial report, within forty-eight (48) hours, followed by a written report filed within seven (7) working days.

Request for Informal Meeting

If either the party requesting an investigation or the Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures

undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within fourteen (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 Commission staff and staff of any other agency 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; and,
- 4) After the conclusion of such a meeting, promptly prepare a summary memorandum which fairly and accurately identifies the positions of all parties and any conclusions reached. Copies shall be distributed to all in attendance and to the project file. 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

The project owner, Commission staff, or any other party may file a complaint or a request for an investigation with the Commission's Chief Counsel. Disputes may pertain to actions or decisions made by any party including the Commission's delegate agents. Requirements for filing a complaint or a request for investigation and a description of how they are processed are in Title 20, California Code of Regulations, section 1230 et seq. The formal process may be in lieu of or in addition to the informal process.

Within thirty (30) days after receipt of a written complaint or a request for investigation, the Chairperson or, if one is assigned, the Committee may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Commission shall have the authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction (Title 20, California Code of Regulations, sections 1232 - 1236).

POST CERTIFICATION CHANGES TO THE COMMISSION DECISION: AMENDMENTS, STAFF CHANGES AND VERIFICATION CHANGES

The project owner must petition the Commission, pursuant to Title 20, California Code of Regulations, section 1769, to 1) delete or change a Condition of Certification; 2) modify the project design or operational requirements; 3) transfer ownership or operational control of the facility; or 4) change a condition verification requirement.

The petition for a change must be submitted to the Commission's Docket in accordance with Title 20, California Code of Regulations, section 1209. The criteria under Section 1769 that determine which type of change process applies are explained below.

Amendment

A proposed change will be processed as an amendment requiring Commission approval if it involves a change to the requirement or protocol (and in some cases the verification) portion of a Condition of Certification, an ownership or operator change, or a potential significant environmental impact.

Insignificant Staff Change

The proposed change will be processed as an insignificant staff change, not requiring Commission approval, if it does not require changing the language in a Condition of Certification, does not have a potential significant environmental impact, and will not cause the project to violate laws, ordinances, regulations or standards.

Verification Change

The proposed change will be processed as a verification or insignificant change if it involves only the language in the verification portion of the Condition of Certification. This procedure can only be used to change verification requirements that are of an administrative nature, usually the timing of a required action. In the event that verification language contains technical requirements, the proposed change must be processed as an amendment requiring Commission approval.

KEY EVENT LIST

PROJECT _____ DATE ENTERED _____

DOCKET # _____ PROJECT MANAGER _____

<i>EVENT DESCRIPTION</i>	<i>DATE ASSIGNED</i>
Date of Certification	
Start of Construction	
Completion of Construction	
Start of Operation (1st Turbine Roll)	
Start of Rainy Season	
End of Rainy Season	
Start T/L Construction	
Complete T/L Construction	
Start Fuel Supply Line Construction	
Complete Fuel Supply Line Construction	
Start Rough Grading	
Complete Rough Grading	
Start of Water Supply Line Construction	
Complete Water Supply Line Construction	
Start Implementing Erosion Control Measures	
Complete Implementing Erosion Control Measures	

V. ENGINEERING ASSESSMENT

The broad engineering assessment conducted for the Elk Hills Power Project is comprised of individual analyses affecting the facility design, as well as the efficiency and the reliability of the proposed power plant. The subjects of this assessment include not only the power generating equipment, but also other project-related elements such as the associated linear facilities (the transmission line, the natural gas supply pipeline, the raw water supply pipeline, and the potable water line).

A. FACILITY DESIGN

SUMMARY AND DISCUSSION OF THE EVIDENCE

The facility design portion of the engineering assessment combines four technical topic areas: civil engineering; structural engineering; mechanical engineering; and electrical engineering. (1/20/00 RT 24:11-14; see also Ex. 1, / 3.0, and Apps. A-H.) Even though the Applicant has not determined the final design of the project, sufficient detail exists to permit an analysis of whether the project can be designed and constructed both in accordance with applicable law, and in a manner that protects environmental quality, and public health and safety. As part of this analysis, the Commission also considered the necessity for special design features to address unique site conditions. Finally, the Commission establishes Conditions of Certification to ensure that the Applicant will in fact design and construct the project in an acceptable manner. (1/20/00 RT 24:11-26:22.)

The project site is located in Seismic Zone 4, a designation indicating the highest level of potential earthquake-related shaking in California. (Ex. 19, p. 290.) To address this potentiality, major structures and components will be designed and

constructed in conformance with the analysis requirements of the most recent edition of the California Building Code¹⁰ including the (Ex. 1, App. B-24-27.):

- combustion turbine generator pedestal and foundation;
- steam turbine generator pedestal and foundation;
- heat recovery steam generator structure and foundation;
- exhaust stack foundation; and
- and cooling tower.

Mechanical features of the Elk Hills project include:

- two combustion turbine generators burning natural gas, with dry-low NO_x combustors used to control NO_x;
- two heat recovery steam generators with 120-foot tall stacks;
- a steam turbine generator;
- feed water system;
- a wet cooling tower;
- turbine inlet air cooling systems, evaporative type;
- water and wastewater treatment equipment;
- pressure vessels;
- piping systems and pumps;
- two 12,000 gallon aqueous ammonia storage tanks;
- ammonia handling and piping system;
- air compressors;
- fire protection systems; and
- heating, ventilating, air conditioning (HVAC), potable water, plumbing and sanitary sewage systems. (Exs.19, p. 293; 1, pp. 3-15-23.)

The mechanical systems will be designed in accordance with applicable codes and standards. (Exs.19, p. 291; 1, p. 3.)

¹⁰ The 1998 edition of the California Building Code is currently in effect. (Ex. 19, p. 291.) Should this version be superseded by the time that the final plans for Elk Hills are submitted, however, the successor version will be used. (*Ibid.*) Equipment items and components subjected to dynamic-analysis requirements will be described in detail prior to the start of that increment of construction of which they are a part. (Condition **STRUC-1.**)

The major electrical equipment associated with the project includes:

- a 8.6 to 9.0-mile-long, 230 kV-double-circuit transmission line;¹¹
- three 13.8/230 kV oil-filled, step-up transformers; and
- power-control wiring, protective relaying, grounding system, site lighting, and cathodic protection system. (Exs. 1, p. 3-23; 19, p. 294; 20.)

The evidence of record concerning design of the facility also includes the ancillary linear facilities. Applicant proposes that West Kern County Water District (WKWD) will supply water for the proposed project. (Ex. 1, p. 3-675.) Water will be conveyed via a new, 9.8-mile, 16-inch-diameter water-supply pipeline extending from existing WKWD facilities located east of the power plant site and adjacent to State Highway 119.¹² (*Ibid.*) Three pumps dedicated to the water supply pipeline, including one spare pump, will be located at 300 feet above mean sea level (MSL).¹³ The power plant site is located at 1330 feet above MSL. (*Ibid.*)

Natural gas will be conveyed to the proposed power plant site via a new, 2500-foot-long, 10-inch-diameter supply pipeline, which will be positioned above ground, on pipe supports. (Ex. 1, p. 3.65.) The route of the new supply pipeline lies entirely within the Elk Hills Oil and Gas Field boundaries. (*Ibid.*)

¹¹ The AFC and testimony established that plans for the project include three alternative routes (Routes 1A, 1B & 1C) for the transmission line; these will be discussed in detail later in this Decision. (Exs. 1, p. 3-53; Ex. 20.)

¹² From the existing WKWD facilities, the water supply pipeline begins underground and crosses both State Highway 119 and Tupman Road. (Ex. 1, p. 3-65.) After the road crossings, the water supply pipeline continues underground alongside existing underground pipelines, extending 4.1 miles west. (*Ibid.*) The water supply pipeline then continues aboveground on pipe supports alongside existing aboveground pipelines, extending 5.7 miles further west and crossing Elk Hills Road to reach the power plant site. (*Ibid.*) The water supply pipeline is steel-constructed with underground portions provided with a minimum of 36 inches of cover and cathodic protection, where soil or other conditions promoting corrosion exist. (*Ibid.*)

¹³ The pipeline is sized to deliver the anticipated daily requirement of 3,100,000 gallons, and an annual requirement of 3,179 acre-feet. (Ex. 1, p. 3-30.)

Potable water will be supplied to the plant from an on-site raw water storage tank with a capacity of 1,000,000 gallons. (Ex. 1, p. 3-30.) 630,000 gallons¹⁴ of raw water will be reserved for plant operation; the remaining 370,000 gallons will be dedicated to the plant's fire protection water system. (*Ibid.*) All water used at the plant will be treated. (Ex. 1, p. 3-35.) Limited water treatment will vary according to the quality required for each of the proposed plant's water uses, i.e., potable water, circulating water, HRSG makeup,¹⁵ CTG evaporative cooler and service water. (*Ibid.*)

Wastewater collected in the proposed plant's wastewater collection tank will be conveyed by a new, 4.4-mile, six-inch diameter pipeline¹⁶ and disposed of by injection into new disposal wells. (Exs. 1, p. 3-66; 19, p. 295.) The new disposal wells will be located south of the power plant site near existing disposal wells used to dispose of produced water from OEHI's operation. (Ex. 19, p. 295.)

The testimony of record indicates the Conditions of Certification will ensure that the final design and construction of the project complies with applicable standards. Contained in these Conditions are requirements specifying the roles, qualifications, and responsibilities of engineers overseeing project design and construction. The Conditions also require that no element of construction proceeds without approval from the local building official and that qualified

¹⁴ This quantity is sufficient to cover a five-hour interruption of water supplied to the power plant. (Ex. 1, p. 3-30.)

¹⁵ Due to the HRSG more stringent water specifications, water supplied from the raw water storage tank is first filtered and then demineralized. (Ex. 1, p. 3-36.) Storage of demineralized water is provided in a 400,000-gallon condensate storage tank, which provides sufficient capacity for nearly two eight-hour periods of peak-load operation coinciding with an outage of the water-treatment system. (*Ibid.*)

¹⁶ The wastewater pipeline originates at the power plant site and runs aboveground on pipe supports, extending one-tenth of a mile east to Elk Hills Road. (Ex. 1, p. 3-66.) The pipeline crosses under Elk Hills Road and Skyline Road contained in a pipe chase. (*Ibid.*) The pipeline then continues aboveground on pipe supports alongside an existing above ground pipeline and generally parallel to Elk Hills Road, extending 4.3 miles south to the wastewater-disposal wells. (*Ibid.*)

special inspectors perform appropriate inspections required by the California Building Code.¹⁷ (See Condition **STRUC-1**.)

The environmental impacts of the project are discussed elsewhere in this Decision (for example, under topics such as Biological Resources and Noise). The testimony indicates that Facility Design considerations do not pose the potential for creating cumulative adverse impacts.

Finally, the testimony addresses potential project closure under three scenarios: planned closure, unexpected temporary closure, and unexpected permanent closure. The testimony of record indicates that the general-closure provisions contained in the Compliance Plan (*ante*) and supplemented by Condition of Certification **GEN-9** are sufficient to adequately address and minimize any potential adverse impacts associated with project closure. (Ex. 19, pp. 298-299.)

FINDINGS AND CONCLUSIONS

Based upon the uncontroverted evidence of record, we find and conclude as follows:

1. The Elk Hills Power Project is currently in the preliminary design stage.
2. The evidence of record contains sufficient information to establish that the proposed facility can be designed and constructed in conformity with the applicable engineering laws, ordinances, regulations, and standards set forth in the appropriate portion of Appendix A of this Decision.
3. 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 and public health and safety concerns.

¹⁷ In this instance, the local Chief Building Official serves as the CEC delegatee. (Ex. 19, p. 291.)

4. The Facility Design aspects of the proposed project do not create potential cumulative impacts.
5. The Conditions of Certification below, and the provisions of the Compliance Plan contained in this Decision, set forth requirements to be followed in the event of the planned, or the unexpected temporary, or the unexpected permanent closure of the facility.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct, and inspect the project in accordance with:

- the 1998 California Building Code (CBC),¹⁸ and
- all other applicable LORS in effect at the time initial design plans are submitted to the CBO for review and approval.

In the event that the EHPP plans are submitted to the CBO when a successor to the 1998 CBC is in effect, the 1998 CBC provisions identified herein 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.

Verification: Thirty (30) days¹⁹ after receipt of the Certificate of Occupancy, the project owner shall submit to the CEC Compliance Project Manager (CPM) a statement of verification. It shall be signed by the responsible design engineer, and attest that all designs, construction, installation, and inspection requirements of the applicable LORS and the CEC's Decision have been met for facility design.

The project owner shall provide the CPM a copy of the Certificate of Occupancy within thirty (30) days of receipt from the CBO [1998 CBC, Section 109 — Certificate of Occupancy.]

¹⁸ The Sections, Chapters, Appendices and Tables, unless otherwise stated, refer to the Sections, Chapters, Appendices and Tables of the 1998 California Building Code (CBC). The CBC in effect is that edition, which has been adopted by the California Building Standards Commission and published at least 180 days previously.

¹⁹ For all times specified in this chapter, except where specifically precluded, the project owner and the CBO may mutually agree to a lesser number of days.

GEN-2 The project owner shall furnish to the CPM and to the CBO a schedule of facility-design submittals, a Master Drawing List, and a Master Specifications List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment.²⁰

To facilitate audits by CEC staff, the project owner shall provide designated packages to the CPM when requested.

Verification: At least sixty (60) days prior to the start of rough grading, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The project owner shall provide schedule updates in the Monthly Compliance Report.

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²⁰ See a list of major structures and equipment in **Table 1, Major Equipment List** and **Table 2, Major Structures, Equipment and Associated Foundations**, below.

Table 1: Major Equipment List

Quantity	Description	Size/Capacity*	Remarks
2	Combustion Turbine (CT).	153 MW	Dry low NO _x combustion control and starter package.
1	Steam turbine	171 MW	Condensing reheat type.
3	Generator.	193 MVA	TEWAC or hydrogen cooling system.
2	CT inlet air filter.	640,000 CFM	
2	Inlet air-cooling.		Evaporative type.
2	Heat Recovery Steam Generator (HRSG).	420,000 lb./hr.	HP and LP
1	Fuel gas filter separator.	3,000 MMBTU/hr.	685 psig minimum inlet.
2	HRSG stack.	18 dia.x120 high	
2	CO catalyst.		Sized to achieve LACT/LAER.
2	Selective catalytic reduction (SCR).		Sized to achieve LACT/LAER.
1	Ammonia injection skid.		
1	Two aqueous ammonia storage tanks.	12,000 gal.	
3	HP/IP HRSG feedwater pump.	100%	610 gpm each.
1	Service/Fire water storage.	1.0 million gal.	
2	Demineralized water pumps.	500 gpm	HP with interstage bleed.
1	Demineralized water treatment package.	500 gpm	
1	Demineralized water storage tank.	69,000 gal.	
1	Steam surface condenser.	1,040 mm Btu/h	
3	Condensate pump.	1,200 gpm	
3	Circulating water pump.	55,000 gpm	
1	Wet cooling tower.	1,040 mm Btu/h	
1	Firewater pump skid.	2-500 gpm pumps	
1	Oily water separator.		
3	Step-up transformer.	18.3 — 230 kV	To electrical grid.

Table 2: Major Structures, Equipment and Associated Foundations

Quantity	Description	Dimensions (ft)*		
		Length	Width	Height
2	Combustion gas turbine generator and starter package (CT).	75	45	45
2	CT air inlet filter with air cooling.	35	35	35
3	Generator with enclosure.	40	20	25
2	Heat recovery steam generator (HRSG).	78	50	97
2	HRSG stack.		18 dia.	120
2	Generator breaker.	15	20	25
1	Steam turbine and condenser.	45	50	30
1	Wet cooling tower.	330	51	35
2	Auxiliary transformer.	25	25	25
3	Step-up transformer.	45	30	25
1	Demineralized water storage tank.	--	20 dia.	30
1	Fire/Service water storage tank.	--	60 dia.	45
1	Two aqueous ammonia storage tanks.	20	12 dia.	12,000 gal.
1	Control building.	80	50	15
1	Administration.	80	50	15
1	Water treatment building.	80	50	20
1	Warehouse.	100	60	20
1	Guard house	15	10	10

***All capacities and dimensions are approximate and may change during project final design.**

GEN-3 The project owner shall make payments to the CBO for design review, plan check, and construction inspection equivalent to the fees listed in the 1998 CBC. (Chapter 1, Section 107 and Table 1-A, Building Permit Fees; Appendix Chapter 33, Section 3310 and Table A-33-A, Grading Plan Review Fees; and Table A-33-B, Grading Permit Fees.)

If Kern County has adjusted the CBC fees for design review, plan check, and construction inspection, the project owner shall pay the adjusted fees.

Verification: The project owner shall make the required payments to the CBO at the time of submittal of the plans, design calculations, specifications, or soil reports. 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 the applicable fee has been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California-registered architect, structural engineer or civil engineer as a resident engineer (RE) to be in general responsible charge of the project. (Building Standards Administrative Code, Title 24, California Code of Regulations, section 4-209,

Designation of Responsibilities.)

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 each part is clearly defined as a distinct unit. Separate assignment of the forgoing general responsible charge may be made for each designated part.

Protocol: The RE shall:

1. Monitor construction progress to ensure compliance with LORS;
2. Ensure that construction of all the facilities conforms in every material respect to the applicable LORS, these Conditions of Certification, approved plans, and specifications;
3. Prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner, or as required by conditions on the project;
4. Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) 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 as not conforming to the approved plans and specifications.

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

If the RE, or any delegated engineer is 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 thirty (30) days²¹ prior to the start of rough grading, the project owner shall submit to the CBO for review and approval:

- the name, qualifications, 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 5 days of the approval. If the RE or the delegated engineer(s) are subsequently reassigned or replaced, the project owner has 5 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 5 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:

1. a civil engineer;²²
2. a geotechnical engineer, or a civil engineer²³ experienced and knowledgeable in the practice of soils engineering;
3. a design engineer, who is either a structural engineer²⁴ or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports;
4. a mechanical engineer; and
5. an electrical engineer.

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers. Except, each engineer shall be responsible for only a single particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support).

²¹ See footnote 20 *infra*.

²² See California Business and Professions Code section 6704 et seq. Sections 6730 and 6736 thereof require state registration to practice as a civil engineer or structural engineer in California.

²³ See note 23 above.

²⁴ See note 23 above.

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 engineers assigned to the project. (1998 CBC, Section 104.2, Powers and Duties of Building Official.)

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.

Protocol: A: The civil engineer shall:

1. Design, or be responsible for design, stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities. 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
2. 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 in the construction procedures.

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

1. Review all the engineering geology reports, and prepare final soils grading report;
2. Prepare the soils engineering reports required by the 1998 CBC. (Appendix Chapter 33, Section 3309.5 — Soils Engineering Report, and Section 3309.6 — Engineering Geology Report);
3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 1998 CBC. (Appendix Chapter 33, section 3317, Grading Inspections);

4. Recommend field changes to the civil engineer and RE;
5. Review the geotechnical report, field exploration report, laboratory tests, and engineering analyses detailing the nature and extent of the site soils that may be susceptible to liquefaction, rapid settlement, or collapse when saturated under load; and
6. Prepare reports on foundation investigation to comply with the 1998 CBC, Chapter 18, section 1804, Foundation Investigations.

This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations. (1998 CBC, section 104.2.4, Stop orders.)

Protocol: C: 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 LORS;
4. Evaluate and recommend necessary changes in design; and
5. Prepare and sign all major building plans, specifications and calculations.

Protocol: D: 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 with all of the mechanical engineering design requirements set forth in the CEC s Decision.

Protocol: E. 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 thirty (30) days²⁵ 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.

GEN-6 Prior to the start of an activity requiring special inspection, 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 1998 CBC. (Chapter 17, Section 1701, Special Inspections, Section 1701.5, Type of Work [requiring special inspection], and Section 106.3.5, Inspection and observation program.)

Protocol: The special inspector(s) shall:

1. Be able to demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;
2. Observe 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, and, if uncorrected, to the CBO and the CPM; 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 and specifications and the applicable provisions of the applicable edition of the CBC.

A 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).

²⁵ See footnote 20 *infra*.

Verification: At least fifteen (15) days prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO:

1. 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; and
2. the qualifications of all special inspectors will also be included in the next Monthly Compliance Report.

In addition, the project owner shall submit to the CPM, in the next Monthly Compliance Report, a copy of the CBO's approval of the qualifications of all special inspectors.

GEN-7 The project owner shall keep the CBO informed regarding the status of engineering and construction. If any discrepancy in design and/or construction is discovered, the project owner shall document the discrepancy and recommend the corrective action required. The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this condition of certification and, if appropriate, the applicable sections of the CBC and/or other LORS.

Verification: The project owner shall submit monthly construction progress reports to the CBO and CPM. The project owner shall transmit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within fifteen (15) days. If 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. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. When the work and the "as-built" and "as graded" plans conform to the approved final plans, the project owner shall notify the CPM regarding the CBO's final approval. The marked up "as-built" drawings for the construction of structural and architectural work shall be submitted to the CBO. Changes approved by the CBO shall be identified on the "as-built" drawings. (1998 CBC, Section 108, Inspections.)

Verification: Within fifteen (15) days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, (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.

GEN-9 The project owner shall file a closure/decommissioning plan with Kern County and the CPM for review and approval at least twelve (12) months (or other mutually agreed to time) prior to commencing closure activities. If the project is abandoned before construction is completed, the project owner shall return the site to its original condition.

Protocol: The closure plan shall include a discussion of and plan for the following:

1. The proposed closure/decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
2. All applicable LORS, all local/regional plans, and a discussion of the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
3. Activities necessary to restore the site if the EHPP decommissioning plan requires removal of all equipment and appurtenant facilities; and
4. Closure/decommissioning alternatives other than complete restoration of the site.

Verification: At least 12 months prior to closure or decommissioning activities, the project owner shall file a copy of the closure/decommissioning plan with Kern County and the CPM for review and approval. Prior to the submittal of the closure plan, a meeting shall be held between the project owner and the CPM to discuss the specific contents of the plan.

CIVIL-1 Prior to the start of site grading, 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 report as required by the 1998 CBC. (Appendix

Chapter 33, Section 3309.5, Soils Engineering Report and
Section 3309.6, Engineering Geology Report.)

Verification: At least 15 days prior to the start of rough or site grading, the project owner shall submit the documents described above to the CBO for 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 RE shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible geotechnical engineer, or 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. (1998 CBC, Section 104.2.4, Stop orders.)

Verification: The project owner shall notify the CPM, within five (5) days, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within five (5) days of the CBO's approval, the project owner shall provide to the CPM a copy of the CBO's approval to resume earthwork and construction in the affected areas.

CIVIL-3 The project owner shall perform inspections in accordance with the 1998 CBC. (Chapter 1, Section 108, Inspections, Chapter 17, Section 1701.6, Continuous and Periodic Special Inspection and Appendix Chapter 33, Section 3317, Grading Inspection.) All plant site-grading operations shall be subject to inspection by the CBO and the CPM.

If, in the course of inspection, it is discovered that the work is not being done 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 detailing all discrepancies and non-compliance items, and the proposed corrective action, and send copies to the CBO and the CPM.

Verification: Within 5 days of the discovery of any discrepancies, the RE shall transmit to the CBO and the CPM a Non-Conformance Report (NCR), and the proposed corrective action. 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 facilities, the project owner shall obtain the CBO's approval of the final "as-graded" grading plans, and final "as-built" plans for the erosion and sedimentation control facilities [1998 CBC, Section 109, Certificate of Occupancy.]

Verification: Within 30 days of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall:

- submit to the CBO 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; and
- submit a copy of this report to the CPM in the next Monthly Compliance Report.

STRUC-1 Prior to the start of any increment of construction, the project owner shall submit to the CBO for 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:

1. Major project structures;
2. Major foundations, equipment supports, and anchorage;
3. Large, field-fabricated tanks;
4. Turbine/generator pedestal; and
5. Switchyard structures.

In addition, the project owner shall, prior to the start of any increment of construction, get approval from the CBO of the lateral force procedures proposed for project structures to comply with the lateral-force provisions of the CBC.

Protocol: 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 (i.e., 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. (1998 CBC, Section 108.4, Approval Required);

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 at least 90 days prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation. (1998 CBC, Section 106.4.2, Retention of plans and Section 106.3.2, Submittal documents.); and
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. (1998 CBC, Section 106.3.4, Architect or Engineer of Record.)

Verification: At least 30 days²⁶ prior to the start of any construction increment, the project owner shall submit to the CBO, the responsible design engineer's signed statement that the final design plans, specifications, and calculations conform with all of the requirements set forth in the CEC's Decision. A copy of the statement shall be provided to the CPM.

If the CBO discovers non-conformance with the stated requirements, the project owner shall resubmit the corrected plans to the CBO within 20 days of receipt of the nonconforming submittal. A copy of the transmittal letter shall be provided to the CPM.

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

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following:

1. Concrete cylinder strength-test reports (including date of testing, date sample taken, design concrete strength, tested

²⁶ See footnote 20 *infra*.

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 structure activities requiring special inspections shall be in accordance with the 1998 CBC. (Chapter 17, Section 1701, Special Inspections, Section 1701.5, Type of Work (requiring special inspection), Section 1702, Structural Observation and Section 1703, Nondestructive Testing.)

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within 5 days, prepare and submit an NCR describing the nature of the discrepancies 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 5 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 5 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 1998 CBC. (Chapter 1, Section 106.3.2, Submittal documents, and Section 106.3.3, Information on plans and specifications.) The submittal shall include the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give 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;

- submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO;
- provide a copy of the transmittal letter to the CPM; and
- notify the CPM, via the next 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 Chapter 3, Table 3-E of the 1998 CBC shall, at a minimum, be designed to comply with Occupancy Category 2 of the 1998 CBC. (Chapter 16, Table 16—K of the 1998 CBC requires use of the following seismic design criteria: $I = 1.25$, $I_p = 1.5$ and $I_w = 1.15$.)

Verification: At least thirty (30) days²⁷ prior to the start of installation of the tanks or vessels that will contain the above specified quantities of highly toxic or explosive substances that would be hazardous to the safety of the general public if released, the project owner shall:

- submit to the CBO for review and approval, final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification;
- send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report; and
- transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-1 Prior to the start of any increment of piping construction, the project owner shall submit for CBO review and approval the proposed final design drawings, specifications, and calculations for each plant piping system.²⁸

The submittal shall also include the applicable QA/QC procedures. The project owner shall design and install all piping, other than domestic water, refrigeration, and small-bore piping to the specifications in the applicable edition of the CBC. Upon completion of construction of any piping system, the project owner shall request the CBO's inspection approval of said construction. (1998 CBC, Section 106.3.2, Submittal documents, Section 108.3, Inspection Requests.)

²⁷ See footnote 20 *infra*.

²⁸ Excluding domestic water, refrigeration systems, and small bore piping, i.e., piping and tubing with a diameter less than two and one-half inches.

Protocol: The responsible mechanical engineer shall submit a signed and stamped statement to the CBO when:

1. The proposed final design plans, specifications and calculations conform with all of the piping requirements set forth in the CEC's Decision; and
2. All of the other piping systems, except domestic water, refrigeration systems and small bore piping have been designed, fabricated and installed in accordance with all applicable ordinances, regulations, laws and industry standards. (See as applicable, 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]; and Specific City/County codes.)

The CBO may require the project owner to employ special inspectors to report directly to the CBO to monitor shop fabrication or equipment installation. (1998 CBC, Section 104.2.2, Deputies.)

Verification: At least 30 days²⁹ prior to the start of any increment of piping construction, the project owner shall:

- submit to the CBO for approval the above-listed documents for that increment of construction of piping systems, including a copy of the signed and stamped engineer's certification of conformance with the CEC's Decision;
- provide a copy of the transmittal letter to the CPM.

In addition, the project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

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 the 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 said installation. (1998 CBC, Section 108.3 — Inspection Requests.)

²⁹ See footnote 20 *infra*.

Protocol: 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;
2. Submit vendor certification, with identification of applicable code, for prefabricated vessels and tanks; and
3. Submit a statement to the CBO from the responsible design engineer declaring 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 days³⁰ prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall:

- submit to the CBO final design plans, specifications, and calculations for review and approval; and
- include a copy of the signed and stamped engineer's certification;
- provide a copy of the transmittal letter to the CPM.

In addition, the project owner shall send copies of the CBO plan-check approvals to the CPM in the following Monthly Compliance Report; and transmit a copy of the CBO's and/or Cal-OSHA inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-3 Prior to the start of construction of any heating, ventilating, air conditioning (HVAC) or refrigeration system, the project owner shall submit to the CBO for review and approval the design plans, specifications, calculations, and quality-control procedures for that 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 applicable edition of the CBC. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications, and calculations shall include

³⁰ See footnote 20 *infra*.

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 [1998 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record.]

Verification: At least 30 days³¹ 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;
- include a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC; and
- provide a copy of the transmittal letter to the CPM.

In addition, the project owner shall send copies of CBO comments and approvals to the CPM in the next Monthly Compliance Report; and transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-4 Prior to the start of each increment of plumbing construction, the project owner shall submit for the CBO's approval the final design plans, specifications, calculations, and QA/QC procedures for all:

- plumbing systems,
- potable-water systems,
- drainage systems (including sanitary drain and waste),
- toilet rooms,
- building energy conservation systems,
- temperature-control and ventilation systems, and
- water and sewer connection permits issued by the local agency.

Upon completion of any increment of construction, the project owner shall request the CBO's inspection approval of said construction. (1998 CBC, Section 108.3, Inspection Requests, Section 108.4, Approval Required.)

Protocol: The project owner shall design, fabricate, and install:

1. Plumbing, potable water, all drainage systems, and toilet rooms in accordance with Title 24. California Code of

³¹ See footnote 20 *infra*.

Regulations, Division 5, Part 5 and the California Plumbing Code (or other relevant section(s) of the currently adopted California Plumbing Code and Title 24, California Code of Regulations); and

2. Building energy conservation systems and temperature control and ventilation systems in accordance with Title 24. (California Code of Regulations, Division 5, Chapter 2-53, Part 2.)

The final plans, specifications, and calculations shall clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. In addition, the responsible mechanical engineer shall stamp and sign all plans, drawings, and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications, and calculations conform with all of the requirements set forth in the CEC's Decision.

Verification: At least 30 days³² prior to the start of construction of any of the above systems, the project owner shall:

- submit to the CBO the final design plans, specifications, and calculations; and
- include a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC.

In addition, the project owner shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report; and transmit a copy of the CBO's inspection approvals to the CPM in the next Monthly Compliance Report following completion of that increment of construction.

ELEC-1 For the 480-volts-and-higher systems, the project owner shall not begin any increment of electrical 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 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 [1998 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests.]

Protocol: The following activities shall be reported in the Monthly Compliance Report:

³² See footnote 20 *infra*.

1. receipt or delay of major electrical equipment;
2. testing or energization of major electrical equipment; and
3. the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days³³ prior to the start of each increment of electrical construction, the project owner shall:

- submit to the CBO for review and approval the final design plans, specifications, and calculations for electrical equipment and systems 480 volts and greater; and
- include a copy of the signed and stamped statement from the responsible electrical engineer attesting to the submittal s compliance with the applicable LORS.

In addition, the project owner shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

ELEC-2 The project owner shall submit to the CBO the required number of copies of items A and B for review and approval and one copy of item C. (CBC 1998, Section 106.3.2, Submittal documents.)

A. Final plant design plans to include:

1. one-line diagrams for the 13.8-kV, 4.16-kV and 480-V systems;
2. system grounding drawings;
3. general arrangement or conduit drawings; and
4. other plans as required by the CBO.

B. Final plant calculations to 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;
7. lighting-energy calculations; and
8. other reasonable calculations as customarily required by the CBO.

³³ See footnote 20 *infra*.

- C. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the CEC Decision.

Verification: At least 30 days prior to the start of each increment of electrical equipment installation, the project owner shall:

- submit to the CBO for review and approval the final design plans, specifications and calculations, for electrical equipment and systems 480 volts and greater enumerated above; and
- include a copy of the signed and stamped statement from the responsible electrical engineer certifying compliance with the applicable LORS.

In addition, the project owner shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

B. POWER PLANT RELIABILITY

Applicable law does not establish specific criteria for power plant reliability or procedures for ensuring reliable operation.³⁴ Nevertheless, the CEC is required to make findings concerning whether the project is likely to be operated in a safe and reliable manner. (Cal. Code of Regs., tit. 20, / 1752 (c).) Generally, a project is considered acceptable if it does not degrade the reliability of the utility system to which it is connected. In this regard, it is necessary to examine whether the Elk Hills project is likely to achieve a level of reliability similar to that of other power plants on the system.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The Elk Hills Power Project throughout its intended life is planned to operate as a baseload and load following unit; it will operate at output levels from 30 to 100 percent of baseload at an overall annual availability factor between 92 and 96 percent.³⁵ (Ex 19, p. 318-19.) Power plant systems such as Elk Hills must be able to operate for extended periods (sometimes for months on end) without shutting down for maintenance or repairs.³⁶ (*Ibid.*) This requirement for equipment availability is typically addressed by strict quality control in machinery design, construction, and installation. (*Ibid.*)

³⁴ A reliable power plant is one that is available when called upon to operate. (Ex. 19, p. 318.) Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability, fuel and water availability, and resistance to natural hazards. (*Ibid.*)

³⁵ The GE gas turbines that will be employed in the project have been on the market for several years, and can be expected to exhibit typically high availability. (Ex. 19, p. 322.)

³⁶ Elk Hills plans to sell reliability-related power services, including operating (spinning) reserves, reactive power, and perhaps black start capability. (Ex. 19, p. 318.)

Plant reliability is further assured by providing for plant maintainability and sufficient redundancy of critical equipment, fuel and water availability, and resistance to natural hazards. (Ex. 19, p. 319.) The basic factors influencing a power plant's reliability are:

- the availability and redundancy of critical equipment;
- the availability of fuel and water; and
- the project's resistance to natural hazards. (Ex. 19, p. 319.)

Applicant will ensure equipment availability by applying appropriate quality assurance and control (QA/QC) programs during design, procurement, construction and operation of the plant. (Ex. 19, p. 319.) For example, equipment and supplies will be purchased from qualified suppliers whose QA/QC programs will be audited. (*Ibid.*) Further, construction and installation will be inspected in accordance with the Applicant's QA plan. (*Ibid.*) During operation, the Applicant will provide for adequate maintenance and repair of all equipment and systems. (*Ibid.*)

Moreover, Applicant has designed the project to use two parallel trains of gas steam turbine generators. (Ex. 19, p. 320.) This design provides for inherent reliability since a failure on one power train should not cause the other train to fail thus allowing the plant to continue to generate (at reduced output). (*Ibid.*) Redundancy of critical equipment will be ensured by provision of the following plant components in sets of two or three, 100 or 50 percent capacity, units:

- boiler feed pumps (three units, 100%),
- condensate pumps (two units, 100%),
- air compressors (two units, 100%),
- water treatment system pumps (two units, 100%),
- service water pumps and heat exchangers (two units, 100%),
- plant water supply pumps (two units, 50%),
- circulating water pumps (three units, 50%), and
- reverse osmosis trains (three units, 50%). (Ex. 19, p. 318-19.)

Applicant's proposed maintenance and QA/QC programs will meet industry standards, and Staff expects that this will allow the project to be adequately maintained to ensure acceptable reliability. (*Ibid.*)

The evidence further indicates that there are and will continue to be adequate natural gas supplies and pipeline capacity to meet project needs. (Ex. 19, p. 320.) Water for the Elk Hills Power Project will be supplied by the WKWD under a long-term contract. (Ex. 19, p. 321, Ex.1, App. N.) Water requirements for the proposed project amount to approximately 3200 acre-feet per year. (Ex. 1, p. 4-9.)

In the event of curtailment in deliveries to WKWD customers, domestic customers have first priority and industrial customers have second priority (WKWD has no agricultural customers). (*Ibid.*) Domestic customer deliveries, however, represent only about 20 percent of water WKWD supplies. (*Ibid.*) Elk Hills proposed contract with WKWD would place it among those industrial customers with take-or-pay contracts having first priority. (*Ibid.*) These levels of water requirements should not jeopardize the project's reliability.³⁷ (Ex. 19, p. 320.)

Moreover, the criteria specified in the preceding Facility Design portion of this decision will ensure that the Elk Hills Power Project will be reasonably resistant to natural hazards such as flooding and seismic shaking. (Ex. 19, p. 320.) Staff concluded that there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events. (*Ibid.*)

FINDINGS AND CONCLUSIONS

Based upon the uncontroverted evidence of record, we find and conclude as follows:

1. There are no established specific criteria governing power plant reliability or procedures for ensuring reliable operation.
2. It is reasonable to use industry standards in assessing the reliability of the proposed project.
3. The estimated availability factor for the Elk Hills Power Project is from 92 to 96 percent, somewhat above industry norms.
4. The equipment availability, redundancy, maintenance, quality assurance, quality control, and facility design factors described in the evidence of record make it likely that the Elk Hills Power Project will meet industry norms for reliability.
5. Fuel supplies for the proposed project are available in quantities sufficient to ensure reliable project operation.
6. Water supplies for the proposed project are available in sufficient quantities to meet project needs.
7. The project will not degrade the overall reliability of the electrical system nor contribute to a cumulative adverse impact to such system.

There are no conditions associated with power plant reliability. We conclude, however, that the project is likely to operate in an acceptably reliable manner.

³⁷ See our Soil and Water section, *infra*, for a complete discussion of the water source implications of using WKWD groundwater.

C. POWER PLANT EFFICIENCY

The California Environmental Quality Act (CEQA) and its implementing regulations require us to consider a proposed power plant's:

- energy requirements and energy use efficiency;
- effects on local and regional energy supplies and resources;
- requirements for additional energy supply capacity; and
- compliance with existing energy standards, and whether there are any feasible alternatives that could reduce a wasteful, inefficient, and unnecessary consumption of energy. (Pub. Resources Code, / 21002.1; CCR, tit. 14, Appendix F.)

Summary and Discussion of the Evidence

The evidence of record addresses:

- whether the Elk Hills Power Project will likely present any adverse impacts to energy resources;
- whether any adverse impacts would likely be significant and; if so,
- whether feasible mitigation measures exist to adequately reduce or eliminate them.

In this context, the energy resource of concern is natural gas, the fuel supply for the project. (Ex. 19, p. 326.) The proposed project will burn natural gas at a maximum rate exceeding 71 billion Btu per day. (*Ibid.*) Staff concluded that supplies of natural gas and the means for transporting the fuel to the proposed project are more than adequate. (Ex. 19, p. 330.)

Modern gas turbines embody the most fuel-efficient generating technology available today. (Ex. 19, p. 328.) Likewise, the General Electric F-class gas turbines the proposed project plans to employ represent some of the most modern and efficient machines available. (*Ibid.*)

The Elk Hills Power Project is intended to operate as a baseload unit, supplying large steady loads efficiently for long periods. (Ex. 19, p. 327.) Moreover,

the proposed plant's configuration is suitable for a plant meant to provide flexible generation, such as load-following duty. (Ex. 19, pp. 327-28.)

The proposed project is configured as a two train, combined cycle power plant, in which electricity is generated by two combustion gas turbines (CTG) and by a steam turbine generator (STG). (Ex. 19, p. 327.) The STG operates on heat energy recuperated from the CTGs' exhaust. (*Ibid.*) By recovering this heat, which would otherwise be lost to exhaust, the efficiency of any combined cycle power plant is increased considerably from that of either a CTG or STG operating alone. (*Ibid.*)

The number of turbines further contributes to efficiency at part load. (Ex. 19, p. 327.) CTGs operate most efficiently at one particular output level, which typically is full load. (*Ibid.*) Whenever less power is needed, the unit must be throttled back with a consequential reduction in efficiency. (*Ibid.*)

However, the Elk Hills Power Project is configured so that the power plant operator will have the option of shutting off one gas turbine. (Ex. 19, p. 327.) This will allow the plant to generate at less than full load while maintaining optimum efficiency. (*Ibid.*) Loads down to 50 percent of full load allow one CTG and the STG to operate at full load and maintain peak efficiency. (Ex. 19, p. 328.)

The evidence further indicates that Staff and Applicant completed a comprehensive analysis of both the technology and alternatives available to the proposed project. (Ex. 19, pp. 328-330.) Staff concluded that the project configuration and generating equipment represent the most efficient feasible combination to satisfy the objectives of the proposed project. (Ex. 19, p. 330.)

Further, Staff concluded that supplies of natural gas and the means for transporting the fuel to the proposed project are more than adequate when

considered with other projects proposed in close proximity. (Ex. 19, p. 330.) The approved La Paloma project (Docket No, 98-AFC-2), the pending Sunrise (Docket No. 98-AFC-4), and Midway Sunset (Docket No. 99-AFC-9) projects were considered in assessing the adequacy of gas supplies. (*Ibid.*)

Finally, the criteria specified in the preceding Facility Design portion of this Decision will ensure that the proposed project will be reasonably resistant to natural hazards such as flooding and seismic shaking.

Staff concluded that the Elk Hills project would create no adverse impacts to the electrical system. (Ex. 19, p. 335.) Similarly, the project does not pose the potential for cumulative adverse impacts to the electrical system. (*Ibid.*)

FINDINGS AND CONCLUSIONS

Based on the uncontroverted evidence of record, we find and conclude as follows:

1. Applicant will employ gas turbines that are among the most fuel-efficient currently available.
2. The project will not create a substantial increase in demand for natural gas.
3. Available gas supplies exceed the fuel requirements of the proposed project.
4. The proposed project's two train, combined cycle design will allow the power plant to generate electricity at less than full load while maintaining optimum efficiency.
5. The operational efficiency of the proposed project is substantially equal or exceeds that of other available technologies.
6. The Elk Hills Power Project will not consume natural gas in a wasteful, inefficient, or unnecessary manner.

We therefore conclude that the proposed project will cause no significant direct

or indirect adverse impacts upon energy resources.

D. TRANSMISSION SYSTEM ENGINEERING

In addition to the power plant portion of Elk Hills, Applicant will construct a transmission tie-line as an appurtenant facility. (See Pub. Resources Code, §§ 25120, 25110.) The Commission's jurisdiction includes "...any electric power line carrying electric power from a thermal power plant...to a point of junction with any interconnected transmission system." (Pub. Resources Code, § 25107.)

The Elk Hills project will access the California electricity market through a new Elk Hills switching station or via Pacific Gas & Electric Company's (PG&E) Midway Substation near Buttonwillow, California. (Ex. 19, p. 335.)³⁸ The California Independent System Operation (Cal-ISO) is responsible for ensuring electric system reliability for all participating transmission owning utilities and determines both the standards necessary to achieve reliability and whether a proposed project conforms with those standards. The Commission relies on the Cal-ISO's determinations to make its findings related to applicable reliability standards and the need for additional transmission facilities. Accordingly, the CEC's examination of the Transmission System Engineering factors includes determining whether the transmission intertie facilities are likely to conform to all applicable laws, ordinances, regulations and standards (LORS). These LORS are in place to ensure safe and reliable electric power transmission and, if deemed appropriate, what mitigation may be needed. (Ex. 19, p. 333; 1/25 RT 36:9-15.) As explained below, the Commission's review has been coordinated with the evaluation performed by the Cal-ISO in order to determine the project's potential effects upon the interconnected electrical grid. (*Ibid.*)

³⁸Any tie-line between the Elk Hills Power Project and the Midway Substation is not part of the electric system grid controlled by the California Independent System Operator (Cal-ISO testimony, Ex. 24.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

Description

Elk Hills, a merchant power project, will have a nominal output of 500 MW for sale of electricity into the California market. (Ex. 19, p. 335.) Elk Hills has proposed three alternative transmission line routes. (*Ibid*; Ex. 24.) The first route, Transmission Route 1A, calls for a 9-mile line, which would loop into the existing Midway-Wheeler Ridge 230 kV line by way of a new Elk Hills switchyard.³⁹ (1/25 RT 35:8-12.) The second route, Transmission Route 1B, calls for an 8.6-mile line that connects the power plant directly to the Midway substation. (1/25 RT 35:12-14.) The third route, Transmission Route 1B Variation, would generally follow the 8.6-mile route of proposed route 1B; but it would replace a portion of the existing Midway-Taft 115 kV line, with a 230 kV line. (1/25 RT 35:14-19.)

The conductors for the proposed Routes 1A and 1B will form two three-phase 230 kV circuits. (Ex. 19, p. 335.) Each of the conductors will be made of 1590 kcmil aluminum conductor, steel reinforced (ACSR) code named lapwing. (*Ibid*.) At 230 kV, each conductor will have a thermal rating of 588 MVA. (*Ibid*.) For the Transmission Route 1B Variation, the replacement conductor for the Taft-Midway 115 kV line has not been determined, but a similar 1590 kcmil conductor is expected to be used. (Ex. 19, p. 335-36.) All three route lines would employ single shaft galvanized tubular steel poles up to the point of interconnection at either the substation for the Midway-Wheeler Ridge loop-in, or the Midway substation. (Ex. 19, p. 336.)

³⁹ The plant's three generators will be individually connected to 13.8/230 kV step-up transformers and then connected to the Elk Hills 230 kV ring bus switchyard. (Exs. 19, p. 335; 1, pp. 3-23 — 3-27.)

Role of Cal-ISO

The interconnection of a new generator (and any associated modifications to the transmission system), if not properly designed and operated, could adversely impact the reliable operation of the state's electrical power system. (Ex. 24, p. 1.) The primary roles of the Cal-ISO, as they pertain to the interconnection of new generation, are to ensure and to coordinate the reliable operation of the Cal-ISO controlled electrical grid. (*Ibid.*) To achieve these goals, the Cal-ISO coordinates the planning of modifications to the grid to ensure they meet the Cal-ISO's Grid Planning Criteria. (*Id.*, p. 2.) These criteria essentially incorporate all Western Systems Coordinating Council (WSCC) Reliability Criteria, the North American Electric Reliability Council (NERC) Planning Standards, and local-area-reliability-criteria. (*Ibid.*)

Commission staff relies on the Cal-ISO's determinations in formulating recommendations to the Commission. (1/25 RT 35:20-36:8.) The Commission's review process includes Cal-ISO's determinations concerning conformance with applicable reliability standards, as well as the need for additional transmission facilities and any attendant environmental review necessitated by a particular project. (1/25 RT 39:12-40:2; Ex. 24, p. 10.)

To fulfill its primary role, the Cal-ISO reviewed the preliminary interconnection study performed at Elk Hills request by the Participating Transmission Owner (PTO). (Ex. 24, p. 1.) The PTO in the present case is PG&E. (*Ibid.*) The Cal-ISO may also perform independent analyses to determine a proposed project's impacts upon system reliability.⁴⁰ (*Ibid.*)

⁴⁰ The Cal-ISO performed an independent power flow analysis for the Elk Hills project. (Ex. 24, p. 1.)

The Cal-ISO assesses a proposed project to determine whether the new project would cause thermal overloads, voltages which are too high or too low, and/or electrical system instability. (Ex. 24, p. 7.) In addition, the reliability evaluation considers credible emergency conditions including the loss of a single or double circuit line, the loss of a transformer or generator, or the loss of a combination of these facilities. (*Ibid.*)

Results of Analysis

The evidence clearly establishes that, after performing its review and analysis, the Cal-ISO determined that interconnection of the Elk Hills Power Project at the Midway Substation would cause no adverse impacts to the electrical grid system. (1/25/00 RT 37:17-40:5; Exs. 17; 24, pp. 3-10.) Furthermore, Elk Hills connection via alternative Transmission Routes 1A and 1B will not require construction of additional facilities downstream of the Midway Substation. (Ex. 19, pp. 338, 342; Ex. 24, pp. 3-4.) The Transmission Route 1B Variation will require additional 115/70 kV transformer capacity to be provided at the Taft substation. (Ex. 19, p. 338.) For all three transmission line alternatives, it will be necessary for Elk Hills to participate in the existing Path 15 remedial action scheme,⁴¹ and a new Midway 500/230 kV RAS. (Ex. 19, pp. 338.) The Cal-ISO has therefore given its preliminary approval of the project's transmission interconnection. (*Ibid.*)

Finally, Elk Hills expressed intent to join in either existing or new RAS will mitigate any of the project's resulting reliability criteria violations. (Ex. 24, pp. 3-4.) The specifics of any necessary remedial action schemes will be determined when PG&E prepares its Detailed Facilities Study, after review of which the Cal-ISO is expected to give its final approval for the Elk Hills project. (Exs. 19, pp.

⁴¹ A remedial action scheme (RAS) is an automatic control provision that, for example, can decrease the Elk Hills Power Plant's output to maintain system reliability. (Ex. 24, p. 15.)

338-339; 24, p. 10.) A Condition of Certification [**TSE-1(h)**], below, requires that the study be provided to the Commission before construction of the transmission facilities.

Alternatives

The evidence demonstrates that Elk Hills has analyzed three potential transmission line routes and is seeking certification for all of them. Cal-ISO has given preliminary approval of each route with attendant mitigation requirements for each alternative. Condition **TSE-1(h)** ensures that an appropriate intertie connection will be implemented in accordance with the Cal-ISO approved Facility Interconnection Agreement.

Cumulative Impacts

The potential cumulative effects of power plants at Morro Bay, Sunrise, La Paloma, and Elk Hills, were assessed in sensitivity analyses performed as part of the PG&E System Impact Study for the Elk Hills project.⁴² (Ex. 19, p. 340; Ex. 17.) This analysis found that, while intra-zonal congestion may occur with the addition of Morro Bay, no additional transmission facilities or RAS applications (other than those already identified without Morro Bay) will be required in order to meet reliability criteria. (*Ibid.*)

⁴² As indicated in the FSA, the La Paloma, Midway Sunset, Sunrise and Elk Hills projects have described interconnection options that loop into the Midway-Wheeler Ridge 230 kV transmission line that is co-owned by PG&E and the California Department of Water Resources. (Ex. 19, p. 340.) Staff concluded that there was insufficient data to evaluate cumulative impacts on the transmission system for all these projects. (*Ibid.*) If all projects use the Midway-Wheeler Ridge option, however, a RAS identified by Cal-ISO may be implemented under specific conditions. (*Ibid.*)

Closure

Before generating facilities are permitted to provide power to the California Power Exchange, generator standards must be met and power plant operators must commit to comply with instructions of the Cal-ISO dispatchers. Participating generators must sign a Participating Generator Agreement. (Ex. 19, p. 340-341.) The evidence indicates that procedures for planned, unexpected temporary, and unexpected permanent closure are developed as part of this process to establish coordination between the generator, the PTO, and the Cal-ISO. (*Ibid.*) Furthermore, rules promulgated by the California Public Utilities (PUC) also govern project closure. (*Ibid.*) In addition, the Compliance Plan incorporated as part of this Decision contains additional provisions ensuring that project closure will comply with applicable laws, ordinances, regulations, and standards, and that system safety and reliability will not be jeopardized. (*Ibid.*)

FINDINGS AND CONCLUSIONS

Based on the uncontroverted evidence of record, we find and conclude as follows:

1. The California Independent Systems Operator (Cal-ISO) has determined that interconnecting the Elk Hills Power Project at the Midway Substation will not create adverse impacts to the reliability of the electrical system.
2. The Cal-ISO has determined that interconnecting the Elk Hills Power Project will not require the construction of additional transmission facilities downstream of the Midway Substation via alternative Routes 1A or 1B.
3. The Cal-ISO has determined that interconnecting the Elk Hills Power Project via the Route 1B Variation will require additional 115/70 kV transformer capacity to be provided at the Taft substation.
4. The Elk Hills Power Project will operate according to remedial action schemes specified by the Cal-ISO.
5. The Cal-ISO's determinations are based on its review of the preliminary interconnection and facilities study.

6. A final Detailed Facilities Study is forthcoming and the evidence of record establishes that this document is not expected to alter conclusions reached concerning the acceptability of interconnecting the Elk Hills Power Project at the Midway Substation.
7. The proposed outlet lines from the project to the point of interconnection are designed to transport approximately 500 MW in an acceptably economic manner.
8. There is insufficient data in the record to fully evaluate potential cumulative impacts of the Elk Hills Power Project on the transmission system. However, the sensitivity analysis performed as part of the PG&E System Impact Study for the Elk Hills project found that no additional transmission facilities will be required. Likewise, no additional remedial action schemes (RAS) applications will be required beyond those identified before addition of the Morro Bay project.
9. The connection of other generating facilities to the Midway Substation in the future may necessitate advanced mitigation measures such as modifications to the substation, upgrading overloaded facilities, construction of new transmission facilities, or absorbing congestion costs.
10. This Decision does not address economic cost allocations of potential transmission mitigation between or among project developers in the future.
11. Conditions of Certification enumerated below will ensure that the transmission aspects of the Elk Hills Power Project will be designed, constructed, and operated to conform with applicable LORS, which are identified in Appendix A of this Decision.

We therefore conclude that interconnection of the project at the Midway Substation is acceptable, and that it will not result in the violation of any criteria pertinent to transmission system engineering.

CONDITIONS OF CERTIFICATION

- TSE-1** The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to requirements listed below. The substitution of Compliance Project Manager (CPM) approved equivalent equipment and equivalent substation configurations is acceptable.

- a) The Elk Hills project 230 kV substation shall include busses in a ring configuration or a breaker and a half scheme;
- b) Breakers and bus in the power plant switchyard and other switchyards where it s appropriate shall be sized to comply with a short circuit analysis;
- c) Conductors shall be sized to reliably accommodate the power transfer;
- d) The power plant switchyard, outlet line and termination shall meet or exceed the requirements CPUC General Order 95;
- e) One of the three transmission line routes and termination alternatives shall be selected for construction;
- f) Termination facilities at the Midway substation shall comply with applicable Cal-ISO and PG&E interconnection standards. (PG&E Interconnection Handbook and CPUC Rule 21.);
- g) 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;
- h) The applicant shall provide a Detailed Facilities Study including a description of remedial action scheme sequencing and timing and an executed Facility Interconnection Agreement for the Elk Hills project transmission interconnection with PG&E;
- i) The Detailed Facilities Study and Interconnection Agreement shall be coordinated with the Cal-ISO and shall be in accordance with the Cal-ISO s comments on:
 - the Elk Hills Preliminary Facilities Study;
 - the Preliminary Facilities Study for Elk Hills Power Project Addendum; and
 - the Interim System Impact Study Status Report.
- j) The applicant shall ensure that the 115/70 kV transformer capacity at Taft substation is sufficient to comply with Cal-ISO, WSCC and NERC reliability criteria.

Verification: At least 60 days prior to the start of construction of transmission facilities, the project owner shall submit to the CPM for approval:

1. electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge;
2. a route map;
3. an engineering description of equipment and the configurations covered by requirements 1(a) through 1(i) above;

4. The Detailed Facilities Study and executed interconnection agreement shall concurrently be provided; and
5. substitution of equipment and substation configurations shall be identified and justified by the project owner for CPM approval.

TSE-2 The project owner shall inform the CPM of any impending changes, which may not conform to the requirements 1(a) through 1(i) of **TSE-1**, and have not received CPM 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 CPM.

Verification: At least sixty (60) days prior to construction of transmission facilities, the project owner shall inform the CPM of any impending changes which may not conform to requirements of **TSE-1** and request approval to implement such changes.

TSE-3 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM approved changes thereto, to ensure conformance with CPUC GO-95 and CPUC Rule No. 21 and these conditions. In case of non-conformance, the project owner shall inform the CPM in writing, within 10 days, of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within sixty (60) days after synchronization of the project, the project owner shall transmit to the CPM an engineering description(s), and one-line drawings of the as-built facilities, signed and sealed by the registered electrical engineer in charge. A statement attesting to conformance with CPUC GO-95, CPUC Rule No. 21, the PG&E Interconnection Handbook, and these conditions shall be concurrently provided.

E. TRANSMISSION LINE SAFETY AND NUISANCE

Applicant will construct a transmission line 8.6 to 9 miles long as part of the Elk Hills Power Project. This double circuit 230 kV line will originate from the project switchyard and terminate at PG&E's Midway Substation near Buttonwillow, or loop into the existing Midway-Wheeler Ridge 230 kV line. The transmission line has the potential to cause both safety hazards and nuisance impacts. Therefore, the line was evaluated to ascertain whether it created aviation safety hazards or interfered with radio frequency communication, as well as whether it would result in audible noise, fire hazards, nuisance shocks, or an undesirable level of exposure to electric and magnetic fields.

SUMMARY AND DISCUSSION OF THE EVIDENCE

Safety Hazards

The transmission line may pose a hazard to aviation, cause fires, and create electric and magnetic field exposures. Compliance with prescribed laws, ordinances, regulations, and standards (LORS), however, will reduce these potential hazards to acceptable levels.

The evidence shows that there are no major aviation centers near the proposed facility. (Exs. 19, p. 53; 1, p. 4-2.) There is a gravel surfaced 3,000-foot landing strip, occasionally used by crop dusters, located approximated 1.5 miles west of transmission line 1B. (*Ibid.*) The evidence, however, indicates that the transmission tower structures will not present a hazard to flight paths for the landing strip. (*Ibid.*) Compliance with Federal Aviation Administration (FAA) criteria will minimize any potential hazards to aviation safety. Applicant submitted an FAA Notice of Construction or Alteration to ensure compliance with these criteria. (Ex. 19, p. 53.)

Fire hazards could result from sparks from the conductors or from direct contact between the line and nearby trees; however, compliance with the requirements of California Public Utilities Commission General Order 95 will prevent the accumulation of combustible material in the transmission line right-of-way and thus reduce these potential impacts. (Ex. 19, p. 48.) Similarly, hazardous shocks will be reduced by observing applicable standards developed to prevent direct or indirect contact with an energized transmission line. (*Ibid.*)

The transmission line, to the extent possible, will parallel existing roads and transmission line rights-of-way. (Ex. 19, pp. 14-15, 50.) Although the transmission lines will partially traverse agricultural lands, they will be positioned on tubular steel poles at least 30 feet aboveground. (Exs. 19, pp. 49-50; 1 p. 4-2.) The line's location in an existing right-of-way, and in an agricultural area, also minimizes the potential for fire-related hazards. (Ex. 19, p. 54.)

Electric and magnetic fields (EMF) occur whenever electricity is produced. (Ex. 19, p. 51.) Although available scientific evidence does not indicate that EMF exposure causes a significant hazard to humans, the topic has become a matter of increased concern in recent years to those living near high voltage lines. (*Ibid.*) The electric field component of EMF typically manifests itself as radio noise, audible noise, and nuisance shocks; the magnetic field component can penetrate most objects and cause prolonged exposure to individuals. (Ex. 19, p. 52.) The magnetic field component creates concerns about possible public health consequences. (*Ibid.*)

The strengths of the fields from the transmission line can be estimated using established procedures. (Ex. 19, pp. 50, 52.) Electric field strengths are specified in units of kilovolts per meter (kV/m), and magnetic field strengths in milligauss (mG). (*Ibid.*) In the present case, field strength values were calculated for the existing transmission lines, as well as for the proposed line specific to the Elk Hills Power Project. (Exs. 19, p. 54; 1, 4-5:4-6.) The

calculated magnetic field will vary from 21.1mG to 93.7mG. (*Ibid.*) This level is much lower than levels established by states with regulatory limits on such fields. (*Ibid.*) These levels should not create any hazard to the closest residences (within approximately 100 feet) of the line's routing. (Ex. 19, p. 50, 55.)

Nuisance impacts

The transmission line may also interfere with radio frequency communication or cause audible noise or nuisance shocks. (Ex. 19, p. 46; 51.) Design measures will limit the potential for radio frequency interference; the project owner will also investigate and mitigate any complaints of this type. (Ex. 19, p. 53.) The maximum foul/fair-weather noise level, respectively, 24.7 dB and 46.2 dB directly underneath the transmission line, are below the applicable noise values specified in the Kern County Noise Ordinance.⁴³ (Ex. 19, p. 53.) The potential for nuisance shocks within the right-of-way will be minimized by the grounding of fences, metal buildings, and other objects. (Ex. 19, p. 55.)

The evidence of record establishes that the proposed transmission line will be designed to meet applicable safety and nuisance related specifications and regulations, along Alternative Transmission Routes 1A, 1B or the Route 1B Variation. (Ex. 19, p. 55.) Finally, the Conditions of Certification ensure that appropriate design, operation, and mitigation measures relating to potential safety hazards and nuisance impacts will be implemented. (*Ibid.*)

⁴³ According to Applicant, noise levels below 50 dbA typically prompt few or no complaints. (Ex. 1, p. 4-5.)

FINDINGS AND CONCLUSIONS

Based upon the uncontroverted evidence of record, we find and conclude as follows:

1. The proposed transmission lines that will be constructed in conjunction with the Elk Hills Power Project are not likely to create fire hazards nor to cause safety hazards to aviation.
2. The electric and magnetic field strengths created by the project's transmission lines will be within acceptable limits, and will not create significant adverse human health impacts.
3. The project's transmission lines will not cause an unacceptable interference with radio frequency communications, nor create significant shock hazards to humans.
4. Audible noise from the proposed transmission lines will be within acceptable limits.
5. The Conditions of Certification below will ensure that the transmission lines are designed, constructed, and operated in compliance with the applicable laws, ordinances, regulations, and standards specified in the appropriate portion of Appendix A of this Decision.

We therefore conclude that the transmission lines associated with this project will not create any significant safety or nuisance hazards.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the proposed transmission line according to the requirements of GO-95, GO-52, Title 8, Section 2700 et seq. of the California Code of Regulations and PG&E's EMF reduction guidelines.

Verification: 30 days before start of transmission line construction, or as mutually agreed to by the project owner and the CEC Compliance Project Manager (CPM), the project owner shall submit to the CEC's CPM a letter signed by a California registered engineer affirming that the transmission line will be constructed according to the requirements of:

- CPUC General Order 95;
- Cal. Code of Regs., tit. 8, /2700 et seq; and
- PG&E s EMF reduction guidelines.

TLSN-2 The project owner shall make every reasonable effort to identify and correct, on a case-specific basis, all complaints of interference with radio or television signals from operation of the line and related facilities. In addition to any transmission repairs, the relevant corrective actions should include, but shall not be limited to, adjusting or modifying receivers, repairing, replacing or adding antennas, signal amplifiers, filters, or lead-in cables.

The project owner shall maintain written records for a period of five years, of all complaints of radio or television interference attributable to operation together with the corrective action taken in response to each complaint. All complaints shall be recorded to include notations on the corrective action taken. Complaints not leading to a specific action, or for which there was no resolution should be noted and explained. The record shall be signed by the project owner and also the complainant, if possible, to indicate concurrence with the corrective action or agreement, with the justification for a lack of action.

Verification: All reports of line-related complaints shall be summarized and included in the Annual Compliance Report to the CPM.

TLSN-3 The project owner shall engage a qualified consultant to measure the strengths of the line electric and magnetic fields before and after the line is energized. Measurements should be made at appropriate points along the route to allow verification of design assumptions relative to field strengths. The areas to be measured should include the facility switchyard and any residences within 100 feet of the right-of-way.

Verification: The project owner shall file copies of the pre-and post-energization measurements with the CPM within sixty (60) days after measurements are completed.

TLSN-4 The project owner shall ensure that combustible material in close proximity to the energized conductors (e.g. tree branches) are cleared from the right-of-way as required under the provisions of:

1. Public Resources Code, section 4292, and
2. Cal. Code of Regs., tit. 14, /1250.

Verification: The project owner shall provide a summary of inspection results and any fire prevention activities carried out along the right-of-way, in a report to be filed at completion of construction and yearly, thereafter, for 5 years.

TLSN-5 The project owner shall send a letter to all owners of property within 100 feet or adjacent to the right-of-way at least sixty (60) days prior to first transmission of electricity. The letter shall consist of the following:

A discussion of the nature and operation of a transmission line.

- A discussion of the project owner's responsibility for grounding existing fences, gates and other large permanent chargeable objects identified during transmission line construction within the right-of-way regardless of ownership;
- A discussion of the property owner's responsibility for grounding and to notify the project whenever the property owner adds or installs a metallic object; and
- A statement recommending against fueling motor vehicles or other mechanical equipment underneath the line.

Verification: The project owner shall:

- submit the proposed letter to the CPM for review and approval 30 days prior to mailing to the property owners;
- maintain a record of correspondence (notification and response) related to this requirement, in a compliance file at the plant site; and
- notify the CPM in the first Monthly Compliance Report that letters have been mailed and that copies are on file.

TLSN-6 The project owner shall ensure the grounding of any ungrounded permanent metallic objects identified during transmission line construction within the right-of-way, regardless of ownership. Such objects shall include fences, gates, and other large permanent chargeable objects. These objects shall be grounded according to procedures specified in the National Electrical Safety Code.

In case of a refusal by the property owner to permit such grounding, the project owner shall so notify the CPM. Such notification shall include, when possible, the owner's written objection. Upon receipt of such notice, the CPM may waive the requirement for grounding the object involved.

Verification: At least 10 days before the line is energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

VI. PUBLIC HEALTH and SAFETY ASSESSMENT

Construction and operation of the Elk Hills Power Project will create air pollutants and utilize certain hazardous materials that could expose the public and workers at the facility to potential adverse health effects. The following sections describe the regulatory programs, standards, protocols, and analyses that address these concerns.

A. AIR QUALITY

The Commission must find that the project complies with all applicable LORS related to air quality. This section examines the potential adverse impacts of criteria air pollutant emissions resulting from project construction and operation. National ambient air quality standards (NAAQS) have been established for air contaminants identified as criteria air pollutants. (Ex. 19D, Part III, p. 26; see Table 1 below.) These include nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), ozone (O₃), hydrogen sulfide (H₂S), and particulate matter less than 10 microns in diameter (PM₁₀) as well as its precursors: nitrogen oxides (NO_x), and volatile organic compounds (VOC). (*Ibid.*)

The federal Clean Air Act⁴⁴ requires new major stationary sources of air pollution to comply with New Source Review (NSR) requirements in order to obtain permits to operate. (Ex. 19D, Part III, p. 1.) The U.S. Environmental Protection Agency (EPA), which administers the Clean Air Act, has designated all areas of the United States as attainment (air quality better than the NAAQS) or nonattainment (worse than the NAAQS) for criteria air pollutants. (Ex. 19D, Part III, p. 6.)

⁴⁴ Title 42, USC, /7401, et seq.

The proposed project site is located within the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD or District) and, except for ozone and PM₁₀, is classified as a federal attainment area for the criteria pollutants. Attainment areas must comply with the federal Prevention of Significant Deterioration (PSD) regulations. California ambient air quality standards (CAAQS), promulgated by the California Air Resources Board (CARB), reflect NAAQS but are generally more stringent. The federal and state standards are shown below in Table 1.⁴⁵ (Ex. 19D, Part III, p. 2.)

**AIR QUALITY Table 1
Federal and State Ambient Air Quality Standards**

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O ₃)	1 Hour	0.12 ppm (235 $\mu\text{g}/\text{m}^3$)	0.09 ppm (180 $\mu\text{g}/\text{m}^3$)
	8 Hour	0.08 ppm (157 $\mu\text{g}/\text{m}^3$)	---
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO ₂)	Annual Average	0.053 ppm (100 $\mu\text{g}/\text{m}^3$)	---
	1 Hour	---	0.25 ppm (470 $\mu\text{g}/\text{m}^3$)
Sulfur Dioxide (SO ₂)	Annual Average	80 $\mu\text{g}/\text{m}^3$ (0.03 ppm)	---
	24 Hour	365 $\mu\text{g}/\text{m}^3$ (0.14 ppm)	0.04 ppm (105 $\mu\text{g}/\text{m}^3$)
	3 Hour	1300 $\mu\text{g}/\text{m}^3$ (0.5 ppm)	---
	1 Hour	---	0.25 ppm (655 $\mu\text{g}/\text{m}^3$)
Respirable Particulate Matter (PM ₁₀)	Annual Geometric Mean	---	30 $\mu\text{g}/\text{m}^3$
	24 Hour	150 $\mu\text{g}/\text{m}^3$	50 $\mu\text{g}/\text{m}^3$
	Annual Arithmetic Mean	50 $\mu\text{g}/\text{m}^3$	---
Visibility Reducing Particulates	1 Observation	---	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

Source: (Ex. 19D, p. III, p. 7.)

⁴⁵ When not enough ambient data is available to support designation as either attainment or nonattainment, the area may be designated as unclassified. (Ex. 19D, Part III, p. 6.) Unclassified areas are normally treated as attainment areas for regulatory purposes. (*Ibid.*)

Summary of the Evidence

The 500 MW Elk Hills Power Project will consist of:

- two General Electric Frame 7FA combustion turbine generators (CTGs) equipped with dry low nitrogen oxide (NO_x) combustors;
- two heat recovery steam generators (HRSGs) equipped with selective catalytic reduction (SCR) with ammonia injection and an oxidizing catalyst (OC) for NO_x and VOC emission control; and
- associated support equipment. (5/16/00 RT 15:13-16:1; Ex. 19D, Part III, pp. 13-15;

Air Quality Table 2, below, shows estimated project emission levels under start-up and peak load conditions.)

AIR QUALITY Table 2
Project (Per CTG) Hourly Emissions

Operational Profile	NO_x	SO₂	PM₁₀	VOC	CO
CTG Cold Start-up (4 hours) (lbs/event)	152 ^A	8.8	72.0	10.4	76.0
CTG Warm Start-up (2 hours) (lbs/event)	76 ^A	4.4	36.0	5.2	38.0
CTG Steady State at peak load + duct firing at 63.9°F (lbs/hr)	15.8	3.6	18.0	4.0	12.5
Cooling Tower (lbs/hr)	--	--	0.39	--	--
Emergency Fire-water Pump (lbs/hr)	0.98	0.07	0.04	0.17	0.30
2 CTGs at peak load + duct firing at 63.9°F & Cooling Tower + Emergency Fire-water Pump (lbs/hr)	32.6	7.27	36.4	8.2	25.3
Maximum Expected Facility Emissions	77.0 ^B	7.3 ^C	36.4 ^C	8.2 ^C	38.3 ^B
A NO _x startup emissions assume a maximum emission rate of 38 lbs/hr for 2 and 4-hour start-ups. B Maximum expected facility NO _x emissions assume that both turbines are in start-up mode (38 lbs/hr), the cooling tower is operating, and that the emergency fire-water pump is being tested. C Maximum expected facility SO ₂ , PM ₁₀ and VOC emissions assume that both turbines are in peak load operation, the cooling tower is operating and that the emergency fire-water pump is being tested. For more information on the project emissions see Appendix B of Ex. 19D, Part 3.					

Source: (Ex. 19D, Part III, p. 15.)

Dedicated continuous emissions monitoring systems (CEM) installed in the HRSG stacks will sample, analyze, and record NO_x, carbon monoxide (CO), and oxygen (O₂) concentration in the exhaust gas from each stack. (5/16/00 RT 134:21-135:7; Ex. 19D, Part III, p. 35; see Conditions **AQ-C2**, [as revised by Ex. 19 D].)

The western portion of Kern County has been designated as a federal and state nonattainment area for ozone and PM₁₀. (Ex. 19D, Part III, p. 2.) The SJVUAPCD has an air quality plan for achieving attainment under the state and federal Clean Air Acts. (Ex. 19D, Part III, pp. 2-6.) The plan is designed to allow new sources to be permitted while maintaining progress toward clean air goals. (*Ibid.*) Included in the plan are new source review provisions requiring emission offsets for new sources and retrofit measures for existing sources. (*Ibid.*)⁴⁶

1. District's Final Determination of Compliance

On March 30, 2000, SJVUAPCD issued its Final Determination of Compliance (FDOC) for the Elk Hills project. (Ex. 43.) The District's representatives⁴⁷ testified that the FDOC was complete, and that the District had determined that the Elk Hills project satisfied all District rules, including requirements for Best Available Control Technology (BACT), and requirements for offsets. (5/16/00 RT 123:13-138:1.) District witness Mr. Tomlin stated that [t]he offsets for this project are being provided from valid ERCs that were banked in accordance with district rules. Emissions from this project are also being provided at greater than 1:1 ratio. (5/16/00 RT 190-191.)

⁴⁶ See heading number five below for our discussion of ERCs.

⁴⁷ Mr. Seyed Sadredin, the District's Director of Permit Services, and air quality engineer Steve Tomlin appeared and offered sworn testimony on the SJVUAPCD's behalf. (5/16/00 RT 123:13-124:2, 130:17-22.)

a) SCR

In its Top-Down⁴⁸ BACT analysis, the District concluded that:

Elk Hills Power has proposed to meet a NO_x emission rate of 2.5 ppmv @ 15% O₂ (1-hour average)-except during startup/shutdown, using dry low NO_x combustors, SCR with ammonia injection, and natural gas fuel. This is the most effective control option and is therefore BACT. (Ex. 43, App. E-3.)

b) SCONO_x

With respect to SCONO_x technology, the District concluded that:

A complete [SCONO_x] system has never been installed on a gas turbine engine of similar size to GE Frame 7 s to be use [sic] by Elk Hills. Frame 7 machines are not and cannot be considered to constitute the same class due to differences in size, gas flow rate and exhaust gas temperatures, among other characteristics...the SCONO_x technology has still not been achieved-in-practice for Frame 7 class turbines. (Ex. 43, App. E, p. 6.)

c) BACT

Under the District's BACT Guideline 3-11, BACT is the most stringent control technique for the emissions unit and class of source. (Ex. 43, App. D.) Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. (*Ibid.*) Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA-approved State Implementation Plan. (*Ibid.*)

⁴⁸ The top-down process provides that all-available control technologies be ranked in descending order of control effectiveness. The PSD applicant first examines the most stringent-or top alternative. That alternative is established as BACT unless the applicant demonstrates, and the permitting authority in its informed judgment agrees, that technical considerations, or energy, environmental, or economic impacts justify a conclusion that the most stringent technology is not achievable in that case. (Ex. 20, Abreu testimony, Att. to App. B, p. 2.)

2. California Environmental Quality Act (CEQA) Requirements

The Commission not only reviews compliance with Air District rules but also evaluates potential air quality impacts according to CEQA requirements. (See 14 Cal. Code of Regs., App. G [CEQA Guidelines, Appendix G].)

3. Regional Air Quality

a) Meteorology

The Elk Hills project is proposed for the dry, western portion of Kern County. Annual rainfall in the Bakersfield area is only 5.7 inches. (Ex. 19D, Part III, p. 5.) Daily maximum temperatures during the December-January months are a relatively mild 57°F, with lows averaging 38°F. (*Ibid.*) At the Maricopa weather station, a record high of 115°F and record low of 15°F were measured. (*Ibid.*) These temperatures are used in determining the maximum possible emissions from the project and the maximum emissions impacts in the air dispersion modeling analysis. (*Ibid.*)

Winds in the area are strongly influenced by the Temblor Range to the west and the marine air that enters the Central Valley through the Carquinez Strait and Altamont Pass in the Bay Area to the north. (Ex. 19D, Part III, p. 5.) Winds are usually of higher speeds during the summer than in winter, when calm and stagnant atmospheric conditions can occur between storms and the influence of the marine air from the coast is significantly diminished. (*Ibid.*)

Along with the winds, another climatic factor affecting emission impacts is atmospheric stability and mixing height. (Ex. 19D, Part III, p. 5.) During the summer daylight hours, there is more turbulence, more mixing, and less stability. (*Ibid.*) At these times, there is more air pollutant dispersion and thus less air quality impacts from a large emission source such as the Elk Hills project. (*Ibid.*)

During winter months very stable atmospheric conditions can form, resulting in little mixing and generally higher air quality impacts. (*Ibid.*)

b) Ambient Air Quality

Ambient air quality data has been collected by local oil companies for a number of years. (Ex. 19D, Part III, p. 8.) Demonstrated ambient air quality data from 1992 through 1995 collected at the Westside Operators Fellows site, located approximately 8 miles south-southeast of the project site, is provided. (See **Air Quality Table 3.**) The data shows no violations during the period of the air quality standards for NO₂, SO₂, or CO. (Ex. 19D, Part III, p. 8.)

Ambient air quality data is also available from CARB's ozone monitor in Maricopa, located 16 miles south-southeast of the project site, and the Taft College PM₁₀ monitor, located 9 miles south of the project site. (Ex. 19D, Part III, p. 8; see **Air Quality Table 4** below.) It shows frequent violations of the state 1-hour ozone and 24-hour PM₁₀ standard between 1992 and 1997. (*Ibid.*)

**AIR QUALITY Table 3
Maximum PM10, NO2, CO and SO2 Readings
Collected at Fellows and Maricopa**

Pollutant	Averaging Time	1995	1994	1993	Most Restrictive Ambient Air Quality Standard	Air Monitoring Station
PM10	24 hours	80	85	109	50	Fellows
	Annual	24.6	25.9	31.0	30	Fellows
NO2	1 hour	97	81	81	470	Maricopa
	Annual	13.6	16.3	15.6	100	Maricopa
CO	1 hour	2440	2303	2941	23,000	Fellows
	8 hour	1869	1985	2222	10,000	Fellows
SO2	1 hour	65	94	36	655	Fellows
	3 hours	36	57	27	1300	Fellows
	24 hours	13	20	14	130	Fellows
	Annual	1.5	1.8	1.8	80	Fellows

Source: (Ex. 19D, p. III, p. 9.)

AIR QUALITY Table 4
Ozone and PM10 Ambient Air Quality Data

Pollutant & Location		1997	1996	1995	1994	1993
Ozone Maricopa	Maximum concentration (ppm)	.12	.12	.13	.13	.13
	# days exceed standard	24	63	85	78	85
PM10 Taft College	Maximum concentration ($\mu\text{g}/\text{m}^3$)	78	94	93	64	118
	# days exceed standard	6	12	15	6	13
	% of samples above 24-hour standard	10%	20%	25%	11%	23%
California Ozone Ambient Air Quality Standard: 0.09 ppm (1-hour average)						
National Ozone Ambient Air Quality Standard: 0.12 ppm (1-hour average)						
California PM10 Ambient Air Quality Standard: 50 $\mu\text{g}/\text{m}^3$ (24-hour average)						

Source: (Ex. 19D, p. III, p. 9.)

i. Ozone

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants. (Ex. 19D, Part III, p. 8.) Nitrogen oxides (NO_x) and hydrocarbons (Volatile Organic Compounds or VOCs) interact in the presence of sunlight to form ozone. (*Ibid.*)

The most recent CARB report on the contribution of various air districts to ozone violations in other districts concluded that San Joaquin Valley air basin contributes measurably to ambient ozone levels in other districts. (Ex. 19D, Part III, p. 8.) Moreover, other districts contribute to the ozone problems in the SJVUAPCD; thus, ozone formation is a regional problem. (*Ibid.*)

ii. PM_{10}

PM_{10} can be emitted directly or can form many miles downwind from the emission source if various precursor pollutants interact in the atmosphere. (Ex. 19D, Part III, p. 26.) Gaseous emissions of pollutants like NO_x , SO_x , and VOC from turbines, and ammonia from NO_x control equipment can, under certain meteorological conditions, form particulate matter known as nitrates (NO_3), sulfates (SO_4), and organics. (*Ibid.*) These are known as secondary pollutants

since they are not directly emitted from a source but are formed through complex reactions in the atmosphere. (Ex. 19D, Part III, p. 9-10.)

Staff concluded that based on information from the District and from CARB:

- NO_x emissions contribute significantly to the formation of particulate nitrate in the region; and,
- ammonium nitrate is the largest contributor to PM₁₀ levels during the winter when ambient PM₁₀ levels are at their highest. (Ex. 19D, Part III, p. 10.)

3. Potential Impacts

APPLICANT

The central air quality dispute concerned application of SCONOX or SCR as the emissions control technology. Applicant presented a panel of four experts to address various aspects of construction impacts.⁴⁹ Mr. Rowley gave an overview of Applicant's construction design for Elk Hills consistent with our foregoing discussion and Tables. (5/16/00 RT 15:13-16:1.) Mr. Rowley then discussed the differences between SCONOX and SCR. (5/16/00 RT 16:2-39:13; see also Ex. 20.)⁵⁰

a) SCR

Mr. Rowley explained that SCR is a simple, continuous, well-established technology, with wide application in modern power plants, and without any issues related to reliability or scaleup. (5/16/00 RT 35:1-36-1; 21:24-23:3.) According to Mr. Rowley:

Basically it's a continuous, single step reaction where NO_x or oxides of nitrogen and ammonia go in, and on a continuous basis

⁴⁹ Messieurs Alberto Abreu, Dennis J. Champion, Steven R. Radis and Joseph H. Rowley testified for Applicant. (Ex. 19D, Part III, p. 12:14-13:8.) Mr. Rowley is the Director of Project Development for Sempra Energy Resources and Vice President of Elk Hills Power. (Ex. 19D, Part III, p. 13:9-17.)

⁵⁰ Rowley testimony, Ex. 20, p. 2:23-4:6.

water and ordinary nitrogen come out. There are no moving parts. And it s a continuous reaction. (5/16/00 RT 16:10-14.)

The SCR catalyst, which is situated in the HRSG, lasts from three to five years, and then it has to be replaced. (5/16/00 RT 20:5-7; 25:12-26:4; 35:8-39-12.)

Mr. Alberto Abreu, the Manager of Permitting and Licensing for Sempra Energy Resources, performed Applicant s BACT analysis. Based thereon, he concurred with Applicant s choice of SCR over SCONOx as the project s superior design technology for NO_x emissions controls. (5/16/00 RT (40:12-16; 49:23-53:14.)

b) SCONOx

In contrast to SCR s continuous process, Mr. Rowley described SCONOx as a five-step batch process, which requires extensive moving parts or actuators. Actuators drive shafts are connected to dampers, which have mechanical seals. The dampers that would be required for application of SCONOx technology to the Elk Hills project would have to survive in an environment characterized by temperatures ranging from 600-700 degrees. (5/16/00 RT 26:5-38:1.) The dampers would extend all the way across the width of the HRSG, some 25 to 32 feet. (5/16/00 RT 26:5-27:4.)

In the first step NO_x is oxidized to NO₂ that is absorbed by a potassium carbonate coated SCONOx catalyst. During the process, carbon dioxide is created when all of the potassium coating is converted to potassium nitrate. (5/16/00 RT 16:15-17:14.) In step two, the step one catalyst is regenerated by sealing its compartment with the dampers to create an oxygen-free environment. Hydrogen gas and carbon dioxide are admitted into the compartment with the potassium nitrate to regenerate the original potassium carbonate coating. Thereafter the step one process can be replicated. (5/16/00 RT 17:15-18:8.) The hydrogen gas and carbon dioxide react with the potassium nitrate giving off nitrogen and water. (*Ibid.*)

In step three, natural gas and steam are combined in a reformer reactor where a chemical reaction occurs in the presence of a different catalyst. The natural gas and steam are partially converted to hydrogen and carbon dioxide, which is used in step 2. (5/16/00 RT 18:8-18:19.)

Step four involves a SCOSOx process, which precedes step one, where sulfur compounds that ordinarily occur in natural gas are removed before reaching the catalysts so as not to contaminate them.⁵¹ Step five involves the regeneration of the SCOSOx catalyst, a process that is identical to the regeneration gas system employed in step two of the SCONOx regeneration. Similar to SCR, the SCONOx system is situated in the HRSG downstream of the SCOSOx system and its reformer. (5/16/00 RT 18:19-20:17.)

Mr. Rowley testified that scaleup was an issue for SCONOx because the technology has never been demonstrated to work on Frame 7FA CTGs of the type Elk Hills is proposing. SCONOx has been demonstrated at the five-megawatt Genetics Institute facility⁵² and the federal Vernon Cogeneration facility, where it operates at a temperature range of 300 degrees without the SCOSOx application.

Conversely, a temperature range of 600 to 700 degrees would be required for integration of SCONOx with Elk Hills, and the 5MW to 170MW increase represents a 30-fold scaleup. (5/16/00 RT 20:18-25:6.) Mr. Rowley stated that:

I think the principal scale-up issues are the dampers and the seals. Even, uniform distribution of the regeneration gas. The sulfur

⁵¹ A SCOSOx system operates in a similar manner as the SCONOx system, involving an oxidation/absorption step and a catalyst regeneration step. (Ex. 20 [Abreu testimony] App. C, p. 9.) SCOSOx operates to eliminate sulfur fouling in the natural gas supply and flue gas. (*Ibid.*)

⁵² Any HRSG at the Genetics Institute Facility is substantially smaller by scale than the facility that Elk Hills is proposing. (5/16/00 RT 26:24-27:11.)

poisoning of the SCONOx catalyst and the effectiveness of SCOSOx in preventing that poisoning, or deactivation.

And then there s simply the integration of the overall whole. The thing that you learn in any demonstration project is that the various pieces, even when scaled up to full scale, don t always interact with each other the way that you hoped they would. And so there s always integration process in making the overall contraption work. (5/16/00 RT 27:17-28:5.)

c) BACT

Mr. Abreu performed Applicant s BACT analysis, and he gave a summary of what the process requires. (5/16/00 RT 44:20-53:19.) Specifically Mr. Abreu testified that BACT is an emission limitation, not a specific control technology. (5/16/00 RT 46:20-48:25, 52:24-25.) In addition, Mr. Abreu testified that SCR meets BACT requirements, while SCONOx cannot be considered technically feasible for the project based upon scaleup issues discussed above. (5/16/00 RT 49:23-53:14.)

BACT will apply to any air pollutant that results in an emissions increase of two pounds per day. (Ex. 19D, Part III, p. 9-10.) Accordingly, for Elk Hills, BACT will apply to NOx, SO₂, PM₁₀, VOC, and CO emissions from all project sources. (Ex. 19D, Part III, p. 2.)

Elk Hills projected highest daily emissions, based on the highest monthly emissions over the construction period, are shown below.

AIR QUALITY Table 5
Maximum Daily Construction Emissions (lbs/day)

	NOx	VOC	CO	Sox	PM10	Fugitive PM10
Project Site ^a	609.5	532.5	387.6	56.6	66.1	144.1 ^c
All Linear Facilities ^b	103.3	151.3	47.6	9.7	11.4	408.2 ^d
Total	712.8	683.8	435.2	66.3	77.5	552.3

Notes: All activities based on an 8-hour workday, 20 days per month.
^a Includes the combustion turbines, cooling towers, 230kV Substation, water storage tank , associated buildings and services, and employee vehicle emissions.
^b Includes the water supply pipeline & pumping station, waste water pipeline, natural gas pipeline and 230 kV transmission line.
^c Assumes the disturbed earth is 12 acres and 1.2 ton PM/month/acre, 60% of which is PM10, 50% of which will be controlled by watering, averaged over a 3 month peak period.
^d Assumes the total disturbed earth is 113.4 acres for all linear facilities and 1.2 ton PM/month/acre, 60% of which is PM10, 50% of which will be controlled by watering, averaged over a 10 month period.

Source: (Ex. 19D, Part III, p. 11.)

d) Other Construction Impacts

Mr. Abreu testified that Applicant s air quality impacts analysis included:

- emission estimates;
- air quality impacts; and
- PSD analysis and emission offsets determination.

The analyses are all based on worst case scenarios. (Ex. 20.)⁵³ Mr. Abreu testified that Elk Hills emissions sources will consist of exhaust from heavy equipment and fugitive dust from disturbed areas. (*Ibid.*) Criteria pollutant emissions from combustion sources were modeled as a volume source since the different equipment configurations would result in these emissions occurring at various heights. (*Ibid.*) Fugitive dust emissions were modeled as an area source since these emissions would almost all occur at ground level. (*Ibid.*)

Mr. Abreu also testified that air quality modeling demonstrated Elk Hills (1) would not cause any new violations of state and federal ambient air quality standards, and (2) impacts would fall below the level of significance. (5/16/00 RT 43:10-44:4.) The results of Applicant s modeling effort are shown below. (**Air Quality Table 6.**)

⁵³ See Alberto Abreu testimony, Ex. 20, Attachment A, p. 1.

**AIR QUALITY Table 6
Maximum Construction Impacts**

Pollutant	Averaging Time	Impact ($\mu\text{g}/\text{m}^3$)	Background ($\mu\text{g}/\text{m}^3$)	Total Impact ($\mu\text{g}/\text{m}^3$)	Limiting Standard ($\mu\text{g}/\text{m}^3$)	Percent of Standard
NO2	1-hour	593.4	97	690.4	470	147
CO	1-hour	1552.2	2941	4493.0	23,000	20
	8-hour	.9	2222	2750.9	10,000	28
SO2	1-hour	235.4	104	339.4	655	52
	3-hour	162.0	53	215.0	1,300	17
	24-hour	26.7	17	43.7	130	34
PM10	24-hour	206.3	109	315.3	50	631

Source: (Ex. 19D, Part III, p. 19.)

Elk Hills will also provide mitigation for construction emissions of VOC, NO_x, SO_x, and PM₁₀ by surrendering its ERCs prior to commencement of construction as required by Condition of Certification **AQ-18**. Elk Hills believes that these ERCs along with the terms of Conditions of Certification **AQ-C1** and **AQ-C2** insure that the project will not have any significant impact on air quality due to construction impacts.

Mr. Dennis Champion is the project's permitting manager and the Manager of Air Quality Programs for OEHI. (5/16/00 RT 58:10-16.) Mr. Champion testified that the project would entail heavy equipment and fugitive dust emissions for which Applicant utilized acceptable emission factors to determine worst case hourly and annual construction emissions.⁵⁴ (5/16/00 RT 61:19-62:1.) Fugitive dust emissions were based on the EPA's estimated 1.2 tons of total suspended particulate matter (TSP) per acre disturbed per month emission factor. (Ex. 20.)⁵⁵

⁵⁴ Estimated heavy equipment exhaust emission factors were obtained from the EPA and the South Coast Air Quality Management District (SCAQMD), and Applicant estimated use rates for heavy equipment emissions. (5/16/00 RT 61:19-62:1.)

⁵⁵ Champion testimony, Ex. 20, Attachment A, p. 1.

PM₁₀ represents 60 percent of this amount resulting in a worst case emission rate of 2.9 tons of PM₁₀ per month. (*Ibid.*) Consistent with District rules, Applicant proposes to use water to mitigate these emissions with a reasonable expectation to obtain 50 percent control efficiency from such a dust suppression measure on active construction sites. (*Ibid.*) Hence, the average monthly fugitive PM₁₀ emissions are expected to be approximately 1.45 tons. (*Ibid.*)

For construction equipment, Mr. Champion testified that Applicant has investigated, and will use diesel engine ignition timing retard equipment that will assume, conservatively, a 25 percent reduction in NO_x across the entire vehicle fleet. (5/16/00 RT 62:2-12; Ex. 20, Champion testimony, p. 2.) Mr. Champion stated that:

In addition, as provided in Condition AQ-C2 included in the Final Staff Assessment, exhaust filters installed on all suitable construction equipment are expected to provide additional emissions reductions. This condition could be modified to include ignition retard on selected equipment and the submission of an emissions control plan. (Ex. 20, Champion testimony, p. 2.)

STAFF

Staff evaluated the Elk Hills project s potential for causing significant PM₁₀ impacts during construction and concluded that the potential does exist. Staff found that **Table 6** demonstrates construction activities would cause a violation of the state 1-hour average NO₂ standard and further exacerbate existing violations of the state 24-hour average PM₁₀ standard. (Ex. 19D, Part III, p. 19.)

In reviewing the project s construction impacts, Staff determined them not to be occasional or isolated events, but occurring over an area within a few hundred meters of the project site. (Ex. 19D, Part III, p. 2.) Staff determined further that:

- despite short-term impacts, the general public would not be exposed to the construction impacts associated with the project due to its isolated location in an oil field area closed to public access where the impacts will occur; and,
- NO₂ and PM₁₀ construction impacts should be mitigated to the extent feasible due to the likelihood of significant and unavoidable impacts to AAQS. (*Ibid.*)

a) SCR

Staff concurs with the EPA and the District finding that DLN-SCR is technically feasible for Elk Hills. (Ex. 19D, Part III, p. 30.) The DLN portion of the technology controls NO_x formation by premixing the fuel and air prior to firing, thereby lowering the flame temperatures and lowering NO_x while increasing CO slightly. (*Ibid.*) It is common to employ an oxidizing catalyst with the DLN-SCR to control CO emissions, and Elk Hills is proposing to do so. (*Ibid.*) The SCR portion requires the use of ammonia, which must be stored on site. (*Ibid.*) Ammonia is injected into the flue gas upstream of the catalyst bed; the catalyst reacts with ammonia and NO_x to form elemental nitrogen and water.⁵⁶ (*Ibid.*)

In terms of economic feasibility, Staff's BACT analysis found that SCONO_x is approximately three times the cost per ton as compared to SCR's oxidation catalyst. (Ex. 19D, Part III, p. 32-33; Table 7, below.)

⁵⁶ Staff concluded in its Elk Hills FSA hazardous materials assessment that there will be no significant impact from the transportation, storage, or use of anhydrous ammonia. (Ex. 19D, Part III, p. 34; see also Hazardous Materials Management, and Traffic and Transportation topics, *infra.*)

AIR QUALITY Table 7
Economics of Emission Controls for two GE F7A Turbines

	SCR-Catalyst	SCONOx
Installed Capital Cost	6,500,000	31,000,000
Direct Annual Costs		
Labor	46,600	333,300
Maintenance	46,600	333,300
Energy	1,085,900	2,030,500
Parts and Materials	1,884,000 ¹	5,434,000 ^b
Waste Disposal	-	-
Misc.	-	-
Subtotal	3,066,100	8,131,100
Indirect Annual Costs		
Overhead	56,000	400,000
Administrative, Tax & Insurance	260,000	1,240,000
Capital Recovery ²	870,000	4,150,000
Tax Credit	-	-
Subtotal	1,186,000	5,790,000
Total Annual Cost	4,249,100	13,921,100
Total Pollutant Removed (tons/yr)		
NO ₂ ³	410	410
CO ⁴	46	46
Particulate	-28	
Total	428	456
Cost Effectiveness (\$/ton)	9,928	30,529
Basis of Costs		
Energy Use (MWh/yr)	11,500	37,100
Energy Cost (\$/MWh)	35.00	35
Natural Gas Use (MCF/yr)	135,800	244,000
Natural Gas Cost (\$/MMBtu)	3.00	3.00
Ammonia Use (lbs/hr)	85	0
Ammonia Cost (\$/ton)	300	-
<ol style="list-style-type: none"> 1. SCR Catalyst replacement based on replacement of 100% catalyst every 3 years, catalyst cost at 80% of initial equipment cost. CO catalyst replacements based on replacement of 100% of catalyst every 8 years, catalyst cost at 80% of initial equipment cost. 2. Capital Recovery based on 12%. 3. NO_x reduction based on gas-fired operation for 8760 hours per year at 90% capacity factor. 4. CO reduction represents two units operating on natural gas for 8760 hours per year and includes additional emissions due to start-up, shutdown and testing. 5. ABB Environmental could not provide cost for catalyst replacement. Cost estimate based on replacing 100% of catalyst at 7 year intervals with catalyst cost at 80% of initial equipment cost. 		

Source: Ex. 19D, Part III, p. 33.

b) SCONOx

The largest turbine that SCONOx has been applied to is a GE LM2500, approximately 32 MW in capacity or about 1/5th the size of the turbine proposed for the Elk Hills project. (Ex. 19D, Part III, p. 30.) SCONOx would not require an oxidizing catalyst and the use of ammonia to control CO emissions and NO_x. (*Ibid.*)

SCONOx technology employs a reactive catalyst that must be regenerated on a regular basis. . (Ex. 19D, Part III, p. 30.) The catalyst reacts with CO and NO to form CO₂, which is emitted, and NO₂, which is absorbed on the surface of the catalyst until it is saturated. (*Ibid.*) Prior to saturation, the catalyst is regenerated by sealing off the catalyst from the exhaust stream by a pair of mechanical louver doors and subjecting it to a mixture of natural gas and steam to create an oxygen free atmosphere. (*Ibid.*) In sum, the process produces elemental nitrogen and CO₂, which are emitted through the stack. (*Ibid.*)

In the FSA, Staff found that:

Since the ABB version of SCONOx has not been installed yet, it is difficult to assess potential environmental effects. Air emissions may include leakage of regeneration gases, however these gases are primarily natural gas and hydrogen. Therefore they may have a minor greenhouse gas effect (in the case of natural gas), but would not be considered VOC emissions. (Ex. 19D, Part III, p. 34.)

In addition, because the regeneration process requires the use of natural gas, the manufacturer, ABB Environmental (ABB), may require the project operators to store and use liquefied natural gas on site for the continuous regeneration process. (Ex. 19D, Part III, p. 34.) Natural gas storage could present a potentially significant hazard to workers, and possibly the public due to accidental detonation.⁵⁷ (*Ibid.*)

ABB has tested the louver doors used by each module under both static and dynamic thermal conditions similar to those found in the Frame 7F-exhaust stream.⁵⁸ (Ex. 19D, Part III, p. 31.) The testing did not include realistic flow or

⁵⁷ Staff notes that this scenario is unnecessary due to the close proximity of a natural gas plant. (Ex. 19D, Part III, p. 34.)

⁵⁸ ABB Environmental estimates that it would take 15 or more SCONOx modules (as compared to 4 for the LM 2000) to control NOx and CO to the BACT levels identified for a General Electric Frame 7F size power plant. (Ex. 19D, Part III, p. 30.)

emission conditions that can be expected in an actual installation on an F size turbine, nor has an algorithmic control been developed or tested for the 15 or more SCONOx modules. (*Ibid.*)

At the evidentiary hearing, Staff's air quality witness, Joseph Loyer, testified that:

The EPA has come to a conclusion that the technology SCONOx is commercially available. They have concluded that there are no scale-up issues. That is a conclusion that is reached concerning the general mechanics of the device, and I would agree, it looks as if you could take this big levelor door with its seal and you could scale up.

But, with going from any device that is much much smaller to a device that is much much larger, there are always going to be things that you're not cognizant of at the time, that you do not realize will cause a problem, and may end up causing a problem.

I believe in my testimony I don't state that these can't be overcome. I think they certainly can be. I'm not sure if they're enough to eliminate this technology. I'm not sure if they're enough to say that EPA is wrong. (5/16/00 RT 161:5-162:1.)

c) BACT

According to Staff, BACT is a structured program to ensure that new pollution emitting sources have the lowest emissions that is feasible. (Ex. 19D, Part III, p. 29.) EPA instituted and implemented BACT through CARB via the local air districts in California. (*Ibid.*) Staff stated that it is important to recognize that BACT:

- is a level of emissions control based on the demonstrated ability of a technology to achieve it; and
- does not require that any specific technology be installed. (*Ibid.*)

Staff found that both the EPA and the District have determined and agreed on the BACT level for NO₂ and CO for the Elk Hills project as identified below in Table 8.

AIR QUALITY Table 8
BACT Emission Levels for the Elk Hills Power Project

	BACT Level	Averaging Period
NO₂	2.5 ppm @ 15% O ₂	1 hour
CO	4.0 ppm @ 15% O ₂	3 hour

Source: Ex. 19, p. 29.

Based upon its analysis, Staff concluded that:

[T]here is likely to be no significant environmental impact from either DLN-SCR or SCONOx. Provided Elk Hills is willing to work out any reliability issues with ABB Environmental on the SCONOx technology, staff's opinion is to allow the applicant to choose either emission control technology. (Ex. 19D, Part III, p. 35.)

CURE

CURE's contentions are essentially three-fold: (1) SCONOx establishes a new BACT emission limit for both NO_x and CO, (2) the technology is technically feasible and cost effective while (3) eliminating certain hazards associated with SCR. (Ex. 44, p. 1.) Moreover, CURE's witness sought to rebut, categorically, all the contentions raised by Applicant and Staff that would elevate SCR over SCONOx as BACT. (Ex. 44.)

a) SCR

CURE contends that SCR's limitations are primarily as follows:

- oxidizes SO₂ to SO₃ therein increasing stack PM₁₀ emissions by about one pound per hour, which is about four tons per year;
- requires ammonia handling and storage, which creates hazardous conditions; and,
- creates maintenance problems associated with salt deposits within the HRSG and corrosive particulate matter deposits on boiler tubes. (5/16/00 RT 185:23-186:7; Ex. 44, pp. 37-41.)

b) SCONOx

CURE's central theme is that SCONOx meets lower emission limits than SCR, eliminates a number of problems associated with SCR, and is cost effective. (5/16/00 RT 185:19-22; Ex. 44, pp. 28-37.) CURE maintains that EPA has determined SCONOx to be both technically feasible and commercially available for large combined cycle projects. (5/16/00 RT 179:9-181:23; Ex. 44, pp. 9-15.)

c) BACT

CURE points to the numerous BACT analyses, which were submitted during the evidentiary hearings. (5/16/00 RT 230:4-23.) CURE's witness, Dr. Fox, challenged them all claiming that:

[t]he only ones of those BACT analysis that are reasonable are the ones prepared by the vendors. The rest of them are not based on vendor information. They're basically based on numbers that were pulled out of mid-air.

On the other hand, CURE argues that Staff and Applicant err by relying on SCR and an oxidation catalyst to reduce:

- NO₂ emissions to 2.5 ppm averaged over 1 hour, with an ammonia slip of 10 ppm; and
- CO emissions to 4.0 ppm @ 15% O₂ averaged over 3 hours. (CURE's Opening Brief on Phase III issues, p. 1 (internal citations omitted).)

According to CURE, these proposed emission limits do not represent BACT under the federal PSD program, to which the project is subject. (*Ibid.*) CURE states that:

Under the PSD program, BACT is an emission limitation...based on the *maximum degree of reduction* for each pollutant subject to regulation under [the] Act which would be emitted from any proposed major stationary source.... (40 C.F.R. / 52.21(b)(12) (emphasis added).) It is set on a case-by-case-basis...taking into account energy, *environmental*, and economic impacts and other costs. (42 U.S.C. / 7479(3) (emphasis added).) (CURE's Opening

Brief on Phase III issues, p. 1 (with internal citations and original emphasis.)

5. *Mitigation*

District Rule 2102, Section 4.2, requires that Elk Hills provide emission offsets, in the form of banked Emission Reduction Credits (ERCs) for the project's emissions. (Ex. 19D, Part III, p. 37.) Emissions offsets for new sources are required when those sources exceed the following emissions levels:

- Sulfur oxides-150 lbs/day;
- PM₁₀-80lbs/day;
- Oxides of nitrogen-10 tons/year; and
- VOC-10 tons/year. (Ex. 19D, Part III, p. 2.)

The project exceeds all of the above emission levels. (Ex. 19D, Part III, p. 2.) Therefore, offsets are required for all four of these pollutants. (*Ibid.*)

Applicant obtained emission reduction credits (ERCs) from four sources.⁵⁹ (Ex. 19D, Part III, p. 39.) Two of the ERC certificates (VOC and NO_x credits) originate from the same emissions reduction act. (*Ibid.*) This was the retrofit, on March 20, 1989, of existing gas-fired IC engines with pre-combustion chambers. (*Ibid.*) These engines were located at the natural gas plant owned by OEHI. (*Ibid.*)

The ERC certificate used to offset the project's PM₁₀ emissions (inter-pollutant offset trading, NO_x for PM₁₀) originated from the retrofit of 31 existing diesel IC engines with pre-combustion chambers. (Ex. 19D, Part III, p. 39.) This retrofit occurred on December 5, 1990; these engines were also located at natural gas plant owned by OEHI. (*Ibid.*) The ERC certificate used to offset the project's SO_x emissions originated from a shutdown of four boilers at the Rio Bravo Pump Station, which is located near the project site. (*Ibid.*)

⁵⁹ Applicant secured a number of offsets through option agreements. (Ex. 19D, Part III, p. 37.)

Neither EPA nor CARB have raised any questions regarding ERC validity, and Staff found them valid to offset the project's emission impacts. (*Ibid.*) Under SJVUAPCD regulations, the emission offsets shall be adjusted according to their distance from the project, and according to the following ratios:

- within 15 miles of the same source-1.2 to 1;
- 15 miles or more from the source-1.5 to 1; and
- interpollutant offsets (NO_x for PM₁₀) at a ratio of 2.22 pounds of NO_x for every one pound of PM₁₀ (Ex. 19D, Part III, pp. 2, 37, 39; see Condition **AQ-23**.)⁶⁰

A summary of the emission-offset liability is shown below.

**AIR QUALITY Table 9
Emissions Offsets Balance**

	Offsets Required	Offsets Required ^A (with Distance Ratio)	Offsets Provided	Additional Offsets Needed	Average daily Offsets provided	Average daily project emissions
	Tons/year			Lbs/day		
PM10	159.4	353.8	385.7	-31.9	2,113	873.3
NO _x	147.9	147.9	159.0	-11.1	871	759.4
SO ₂	29.2	29.2	34.5	-5.3	189	158.5
VOC	32.7	32.7	26.7	6.0	146	177.8
A For CEQA purposes, the distance ratio for all pollutants is 1:1, the inter-pollutant trading ratio for NO _x for PM ₁₀ is 2.22:1. B The annual offsets provided divided by 365 days/year and multiplied by 2,000 lbs/ton. C Reflect Typical Expected Facility Emissions as reported in Air Quality Table 6.						

Source: (Ex. 19D, Part III, p. 38.)

Air Quality Table 9 shows that Applicant is short 6.0 tons per year of VOC emission offsets. (Ex. 19D, Part III, p. 38.) According to Staff, however, there is a total excess of 43.0 tons per year of NO_x emission credits. (*Ibid.*) That is 31.9 tons from the PM₁₀ ERCs (which includes using interpollutant trading NO_x for PM₁₀) and 11.1 tons from the NO_x ERCs. (*Ibid.*) That is more than 7 times the shortfall in VOC offsets. Since NO_x and VOCs are established ozone precursors,

⁶⁰ Condition **AQ-23** in the FSA provides that NO_x ERCs may be used to offset PM₁₀ emission increases at a ratio of 2.42 lb NO_x: 1 lb PM₁₀ for reductions occurring within 15 miles of this facility, and 2.72 lb NO_x: 1 lb PM₁₀ for reductions occurring greater than 15 miles from this facility. Apparently 2.42 is a typographical error; we have changed the figure to read 2.22. (5/16/00 RT 155:18-156:15.)

it is Staff's opinion that the excess NO_x ERCs more than offset the VOC shortfall. (*Ibid.*) Staff has applied the identical plus factor of the 43-ton excess NO_x credit to compensate for the average daily shortfall in VOC offsets that are shown in **Air Quality Table 9**. (Ex. 19D, Part III, pp. 37-38.)

On the other hand, CURE contends that the Project's offsets were all generated nearly a decade ago and do not comply with federal requirements for valid offsets. (Ex. 44, p. 1.)

6. *Cumulative Impacts*

Cumulative impacts refer to two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact of several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, or reasonably foreseeable, probable future projects. These impacts can result from individually minor but collectively significant projects taking place over a certain period. (14 CCR, /15355.)

Both Staff and Applicant testified that the Elk Hills project would not result in any significant construction or operational cumulative air quality impacts when the project is analyzed in conjunction with other reasonably foreseeable projects in the region.⁶¹ (5/16/00 RT 153:19-24; Ex. 19D, Part III, pp. 24-25; Ex. 20 (Abreu and Radis prefiled testimony), Att. A, pp. 3, 2, respectively.) The three power plant projects analyzed will not cause or contribute to any new violations. They will contribute to existing violations of the PM₁₀ ambient air quality standard. However, each of the projects will provide adequate PM₁₀ offsets to mitigate PM₁₀ emissions. (Ex. 19D, Part III, pp. 24-25.)

⁶¹ Cumulative impacts include air emissions from construction and operation of the Elk Hills project along with the La Paloma and Sunrise projects, both located within six miles of Elk Hills. (5/16/00 RT 153:19-24.)

Because Staff's cumulative impact analysis failed to include any impacts of the proposed Western Midway-Sunset project, CURE alleges that it fails to meet CEQA guidelines. CURE also alleges that the cumulative air quality impact analysis is based on flawed meteorological data. (CURE's Opening Brief on Phase III issues, pp. 6-7.)

COMMISSION DISCUSSION

POTENTIAL IMPACTS

We first address Applicant's invitation for us to modify Condition **AQ-C2** to require, where feasible, ignition retard equipment to provide additional construction PM₁₀ emission reductions. We find that this is an acceptable approach, and we have modified the condition accordingly. We note that Staff and CURE concur with the construction emission assumptions underlying this approach. (5/16/00 RT 152:13-153:11; 235:8-16.)

We do not accept CURE's suggestion for further modification of this Condition. (CURE's Opening Brief on Phase III issues, p. 5.) We agree with Staff's suggestion that further modification to this Condition is unnecessary in light of the certification requirement of a licensed mechanical engineer. (5/16/00 RT 162:3-169:6.)

As to BACT, Dr. Fox testified that: [a]fter Region 9 declared 2.5 ppm NO_x as the BACT limit in March of 1998, the South Coast⁶² reviewed that determination and adopted it as BACT in the South Coast. (5/16/00 RT 180:23-181:1.) She later testified that:

⁶² See South Coast Air Quality Management District (SCACMD), Staff Report for BACT Guidelines Update (Phase IID), June 12, 1998. (Ex. 44, Att. 2.)

[a]nd the South Coast concluded definitively that there were no scale-up issues for this technology. This technology is a monolithic catalyst. There are not scale-up issues with monolithic catalysts. I know of none, and I know of no one in the field that would tell you there is a scale-up issue with this type of technology. (5/16/00 RT 181:6-13.)

We respectfully disagree with Dr. Fox's assertion. We note parenthetically that Applicant's witnesses are certainly in the field, and their testimony clearly indicates some scale-up issues with the SCONOX technology.

In addition, a supplemental BACT analysis that was submitted in the Three Mountain siting case provides the following:

The supplemental BACT analysis explores in detail the open technical issues identified by Stone and Webster in their independent report prepared for ABB on the scale up testing. In particular, we note that the following serious technical issues remain unresolved:

- Successful performance of the damper design;
- Raw natural gas leakage into the heat recovery steam generator, indicating problems in the catalysts regeneration system;
- Failure of the seals, which would be exacerbated by the cyclic nature of operation of a merchant plant;
- The system is still being modeled, indicating that design is not complete;
- The increased number of dampers required for F-class turbines and the failure modes for the dampers and their associated equipment. The large number of dampers increase the likelihood of a damper-related malfunction; and
- Successful operation of the system only 80 percent of the time. (Ex. 20, Mr. Abrew testimony, App. C, p. 2.)

Moreover, in recorded testimony before a Siting Committee of the California Energy Commission on March 2, 2000, ABB representatives characterized the SCONOX process for large turbines as developmental. There, these witnesses supported PG&E Generating Company in their application for a developmental period of three (3) years for SCONOX demonstration at PG&E

Generating Company's proposed Otay Mesa project. (Ex. 20, Mr. Abreu testimony, App. C, p. 2.)

In addition, the South Coast study relied on by Dr. Fox adopted the identical emission standard, which is to be applied for NO_x in this case, as determined by EPA and the District (NO₂ to 2.5 ppm@15%:O₂ over 1 hour, CO to 4.0 ppm @ 15%:O₂ over 3 hours). (5/16/00 RT 154:13-17; Ex. 44, Att. 2, p. 7.) Thus, the use of SCONOx for Elk Hills would not necessarily reduce emissions. Of note, even at the time of the South Coast report, June 12, 1998, there was concern about the availability of the SCONOx technology. (*Id.*, at p. 3-1.)

In the present proceeding, the District witness testified as follows:

Q: CURE bought up the license of the La Paloma Power Plant. Are they still planning on using SCONOx?

Mr. SADREDIN: They did receive a permit with both options, either SCR or SCONOx, having deemed those two options to be equal, but when they went to construction phase the ABB, or the vendor said SCONOx was not available commercially, so they could not provide it to them in time for their facility.

.....
MS. WILLIS: Just one more question. Do you know when that was stated?

Mr. SADREDIN: I believe it was late last year.

MS. WILLIS: Somewhere like November, December of 1999

Mr. SADREDIN: Only within the last six to nine months. (5/16/00 RT 146:18-147:15.)

Likewise, the unavailability of the SCONOx technology was demonstrated by the comments from Martin McFadden, the Vice President of Three Mountain Power. (5/16/00 RT 356:16-367:3.)⁶³ Mr. McFadden provided direct and relevant experience concerning his project's difficulty in securing a bid for the SCONOx application. (*Ibid.*)

⁶³ We note that although Mr. Fadden's presentation was received as comment, the evidentiary record repeats in even more detail the Three Mountain experience with SCONOx. (Ex. 20, Abreu testimony, App. B & C.)

Another commentator, Mr. Ivan Clark,⁶⁴ stated in reference to financing the SCONOx technology that:

Finally, the scale up issue is one that, I guess, that comment relates to the scale-up issue is, in our opinion since there isn't a demonstrated project in the market today that is operating to use as a guide for this project, that's a fundamental flaw for proceeding on SCONOx on a given project at this point. (5/16/00 RT 348:9-351:24.)

Accordingly, we are persuaded that the District's BACT findings are the correct ones across the board to be applied in this matter. Stated differently, the evidence of record fully supports the conclusion that the use of SCR will: (1) enable the project to comply with all applicable air quality LORS; and (2) result in no significant unmitigated effect on air quality. While the SCONOx technology may be promising, the evidence of record simply does not convince us to require its use for the Elk Hills project.

CUMULATIVE IMPACTS

CEQA guidelines state that lead agencies should define the geographic scope of the area affected by the cumulative effect... (14 CCR., / 15130(b)(1)(B)(3).) Generally, Staff considers in its cumulative analysis reasonably foreseeable projects within a six-mile radius of the proposed project site. (Staff's Reply Brief on Phase III issues, p. 2.) The proposed Western Midway-Sunset project is located eight miles from Elk Hills, outside of Staff's defined geographic scope. (5/16/00 RT 172:20-25.)

⁶⁴ Like the previous commentator Mr. McFadden, Mr. Clark has material that was submitted into the air quality evidentiary record. Namely, while project manager for the Towantic Energy project in Massachusetts, he prepared a BACT analysis at the request of the state-licensing department evaluating and comparing SCONOx to SCR. ((5/16/00 RT 154:18-155:17; Ex. 19D, Part III, App. C.)

Staff also points out that Midway-Sunset's AFC was not deemed data adequate until March 8, 2000, when many evidentiary hearings in Elk Hills had already concluded. (Staff Reply Brief on Phase III issues, p. 2.) Staff has requested that Midway-Sunset submit a cumulative analysis that includes Midway-Sunset, La Paloma, Sunrise, and Elk Hills. (Ex. 19D, Part III, p. 24.) We are thus persuaded to defer to Staff's original judgment not to request the analysis from Elk Hills in the first instance. We therefore reject CURE's contention that the cumulative impact analysis is flawed. The existing cumulative analysis considers all projects within a sufficient distance for impact assessment purposes.

Similarly, CURE's contention that meteorological data relied on by Applicant and Staff was flawed is without merit. Applicant points out that the reliance on old data was corrected. (Applicant's Reply Brief on Phase III issues, p. 1.) The new data confirmed the previous finding that the project would not cause any air quality standard violations and would comply with all applicable air quality LORS. (*Ibid.*)

FINDINGS AND CONCLUSIONS

Based upon the weight of the evidence of record, we find and conclude as follows:

1. The Elk Hills Power Project is located in the San Joaquin Valley Air Basin, within the jurisdiction of the San Joaquin Valley Unified Air Pollution Control District (SJVAPCD).
2. The project area is in unclassified/attainment status for applicable federal CO and NO₂ air quality standards, in attainment for the state's CO, NO₂, SO₂, SO₄, and lead standards, and in attainment for federal SO₂ standard. It is designated as non-attainment for both state and federal ozone and PM₁₀ standards.
3. Construction and operation of the Elk Hills Power Project will result in emission of criteria air pollutants.

4. Operation of the project will result in emissions of NO_x, SO₂, PM₁₀, and VOC, which would, if not mitigated, contribute to violations of air quality standards.
5. The Elk Hills Power Project will use Best Available Control Technology (BACT) as determined by the San Joaquin Valley Unified Air Pollution Control District to control emissions of NO_x, CO, SO₂, PM₁₀, and VOC.
6. To minimize NO_x, CO and VOC emissions during the combustion process, the CTG will be equipped with the latest dry low-NO_x combustor design; the HRSG will employ SCR to reduce NO_x emissions, and an oxidizing catalyst to reduce CO and VOC emissions.
7. SJVAPCD released its Final Determination of Compliance (FDOC) for the Elk Hills project on March 30, 2000. The conditions contained in the FDOC are incorporated into the Conditions of Certification below.
8. A representative of the SJVUAPCD has certified that complete emissions offsets for the project have been identified and obtained by the Applicant.
9. BACT for the project's NO_x emissions is 2.5 ppm @ 15% O₂ averaged over one hour, to obtain which Applicant will install DLN-SCR rather than SCONO_x.
10. SCONO_x for the proposed project is approximately three times the cost per turbine as compared to SCR-oxidation catalyst.
11. Applicant has obtained, by direct transfers or legally enforceable option contracts, Emission Reduction Credits (ERCs) sufficient to fully offset the project's increased emissions of NO_x, SO₂, VOC, and PM₁₀, due to project operation, on an annual and a daily basis.
12. To offset PM₁₀ emissions during construction, Applicant shall install oxidizing soot filters on large construction equipment under the conditions set forth below in Condition **AQ-C2**.
13. The Elk Hills Power Project, with the implementation of the measures contained in the Conditions of Certification below, will not, either alone or in combination with other identified projects in the area, cause or contribute to any new or existing violations of applicable ambient air quality standards.
14. With the implementation of the Conditions of Certification specified below, the Elk Hills Power Project will be constructed and operated in compliance with all applicable laws, ordinances, regulations, and standards identified in the pertinent portion of Appendix A of this Decision.

We therefore conclude that with the implementation of the Conditions of Certification below, the Elk Hills Power Project will not create any significant direct, indirect, or cumulative adverse air quality impacts; and will conform with all applicable LORS relating to air quality as set forth in the pertinent portions of Appendix A of this Decision.

CONDITIONS OF CERTIFICATION

AQ-C1 Prior to breaking ground at the project site, the project owner shall prepare a Construction Fugitive Dust Mitigation Plan (CFDMP), which specifically:

- identifies fugitive dust mitigation measures that will be employed for the construction of the Elk Hills Power Project and related facilities; and
- identifies measures to limit fugitive dust emissions from construction of the project site and linear facilities. Measures that should be addressed include the following:

the identification of the employee parking area(s) and surface of the parking area(s);

the frequency of watering of unpaved roads and disturbed areas;

- the application of chemical dust suppressants;
- the use of gravel in high traffic areas;
- the use of paved access aprons;
- the use of posted speed limit signs;
- the use of wheel washing areas prior to large trucks leaving the project site; and,
- the methods that will be used to clean tracked-out mud and dirt from the project site onto public roads.

Verification: At least sixty (60) days prior to breaking ground at the project site, the project owner shall provide the CPM with a copy of the Construction Fugitive Dust Mitigation Plan for approval.

AQ-C2 The project owner shall do all of the following:

1. Ensure that all heavy earthmoving equipment has been properly maintained, including, but not limited to:
 - bulldozers,
 - backhoes,
 - compactors,
 - cranes
 - dump trucks
 - loaders,
 - motor graders

- trenchers, and
 - other heavy duty construction related trucks.
2. Engines shall be:
 - (a) tuned to the engine manufacturer s specifications;
 - (b) provided with ignition retard equipment where feasible, to provide additional NOx emission reductions during construction. Feasibility shall be determined by an independent California Licensed Mechanical Engineer under the identical circumstances presented below.
 3. Install oxidizing soot filters on all suitable construction equipment used either on the power plant construction site or on associated linear construction sites. Suitability is to be determined by an independent California Licensed Mechanical Engineer who will stamp and submit for approval an initial and all subsequent Suitability Reports as necessary containing at a minimum the following:
 4. File an Initial Suitability Report. The initial suitability report shall be submitted to the CPM for approval sixty (60) days prior to breaking ground on the project site. It shall contain:
 - A list of all fuel burning, construction related equipment used;
 - a determination of the suitability of each piece of equipment to work appropriately with an oxidizing soot filter;
 - if a piece of equipment is determined to be suitable, a statement by the independent California Licensed Mechanical Engineer that the oxidizing soot filter has been installed and is functioning properly; and
 - if a piece of equipment is determined to be unsuitable, an explanation by the independent California Licensed Mechanical Engineer as to the cause of this determination.
 5. File a Subsequent Suitability Reports as follows:
 - If a piece of construction related equipment is subsequently determined to be unsuitable for an oxidizing soot filter after such installation has occurred, the filter may be removed immediately.
 - In that event, notification must be sent to the CPM for approval containing an explanation for the change in suitability within ten (10) days.

- Changes in suitability are restricted to three explanations, which must be identified in any subsequent suitability report, as shown below:
- The oxidizing soot filter is reducing normal availability of the construction equipment due to increased downtime, and/or power output due to increased backpressure by 20% or more.
- The oxidizing soot filter is causing or reasonably expected to cause significant damage to the construction equipment engine.
- The oxidizing soot filter is causing or reasonably expected to cause a significant risk to nearby workers or the public.

Verification: The project owner shall submit to the CPM, via the Monthly Compliance Report, documentation, which demonstrates that the contractor's heavy earthmoving equipment is properly maintained and the engines are tuned to the manufacturer's specifications. The project owner shall maintain all records on the site for six months following the start of commercial operation. The project owner will submit to the CPM for approval, the initial suitability report stamped by an independent California Licensed Mechanical Engineer, sixty (60) days prior to breaking ground on the project site. The project owner will submit to the CPM for approval, subsequent suitability reports as required, stamped by an independent California Licensed Mechanical Engineer no later than ten (10) working days following a change in the suitability status of any construction equipment.

Conditions of Certification AQ-1 through AQ-44 apply to the following equipment:

SJVUAPCD Permit No. S-3523-1-0- GE FRAME 7 MODEL PG7241FA NATURAL GAS FIRED COMBINED CYCLE GAS TURBINE ENGINE/ELECTRICAL GENERATOR #1 WITH DRY LOW NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION, OXIDATION CATALYST, AND STEAM TURBINE S-3532-2 (503 MW TOTAL NOMINAL RATING),

SJVUAPCD Permit No. S-3523-2-0- GE FRAME 7 MODEL PG7241FA NATURAL GAS FIRED COMBINED CYCLE GAS TURBINE ENGINE/ELECTRICAL GENERATOR #1 WITH DRY LOW NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION, OXIDATION CATALYST, AND STEAM TURBINE S-3532-2 (503 MW TOTAL NOMINAL RATING),

AQ-1 No air contaminant shall be released into the atmosphere, which causes a public nuisance. [District Rule 4102]

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB) and the Commission.

AQ-2 The project owner shall submit selective catalytic reduction, oxidation catalyst, and continuous emission monitor design details to the District at least 30 days prior to the construction of permanent foundations. [District Rule 2201]

Verification: The project owner shall provide copies of the drawings of the catalyst system chosen and the continuous emission monitor design detail to the CPM and the District at least thirty (30) days prior to the construction of permanent foundations.

AQ-3 Combustion turbine generator (CTG) and electric generator lube oil vents shall be equipped with mist eliminators to maintain visible emissions from lube oil vents shall no greater than 5% opacity, except for three minutes in any hour. [District Rule 2201]

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

AQ-4 The CTG shall be equipped with continuously recording fuel gas flowmeter. [District Rule 2201]

Verification: The information above shall be included in the quarterly reports of Condition **AQ-35**.

AQ-5 CTG exhaust shall be equipped with continuously recording emissions monitor for NO_x (before and after the SCR unit), CO, and O₂ dedicated to this unit. Continuous emission monitors shall meet the requirements of 40 CFR parts 60 and 75 and shall be capable of monitoring emissions during startups and shutdowns as well as normal operating conditions. If relative accuracy of CEM(s) cannot be certified during startup conditions, CEM results during startup and shutdown events shall be replaced with startup emission rates obtained during source testing to determine compliance with emission limits in Conditions **AQ-13, 16, 17 and 18**. [District Rule 2201]

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

AQ-6 Ammonia injection grid shall be equipped with operational ammonia flowmeter and injection pressure indicator. [District Rule 2201]

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

AQ-7 Exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods. [District Rule 1081]

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

AQ-8 Heat recovery steam generator design shall provide space for additional selective catalytic reduction catalyst and oxidizing catalyst if required to meet NO_x and CO emission limits. [District Rule 2201]

Verification: Please refer to Condition **AQ-2**.

AQ-9 The project owner shall monitor and record exhaust gas temperature at the selective catalytic reduction and oxidation catalyst inlets. [District Rule 2201]

Verification: The project owner shall record the exhaust gas and selective catalytic reduction temperatures in the daily logs.

AQ-10 CTG shall be fired on natural gas, consisting primarily of methane and ethane, with a sulfur content no greater than 0.75 grains of sulfur compounds (as S) per 100 dry-scf of natural gas. [District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-11 Startup is defined as the period beginning with initial turbine firing until the unit meets the lb/hr and ppmv emission limits in Condition **AQ-15**. Shutdown is defined as the period beginning with initiation of turbine shutdown sequence and ending with cessation of firing of the gas turbine engine. Startup and shutdown duration shall not exceed the following:

- two hours for a regular startup,
- four hours for an extended startup,
- and one hour for a shutdown, per occurrence. [District Rule 2201 and 4001]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-12 Ammonia shall be injected when the SCR catalyst temperature exceeds 500 degrees F. The project owner shall monitor and record catalyst temperature during periods of startup. [District Rules 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-13 During startup or shutdown of any gas turbine engine(s), combined emissions from both gas turbine engines (s-3523-1-0 and —2-0) heat recovery steam generator exhausts shall not exceed any of the following limits in any one hour:

- NO_x (as NO₂) 76 lbs
- CO 38 lbs

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-14 By two hours after initial turbine firing, CTG exhaust emissions shall not exceed any of the following: NO_x (as NO₂) 12.2 ppmv @ 15% O₂ and CO 25 ppmv @ 15% O₂. [District Rule 4703]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-15 Emission rates from each CTG, except during startup or shutdown, shall not exceed any of the following emission limits:

- PM₁₀ 18 lbs/hr
- SO₂ 3.6 lbs/hr
- NO₂ 15.8 lbs/hr and 2.5 ppmvd @ 15% O₂ averaged over 1-hr
- VOC 4.0 lbs/hr and 2.0 ppmvd @ 15% O₂ averaged over 3-hr
- CO 12.5 lbs/hr and 4 ppmvd @ 15% O₂ averaged over 3-hr
- Ammonia 10 ppmvd @ 15% O₂ averaged over 24-hr [District Rule 2201, 4001 and 4703]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-16 Emission rates from each CTG, on days when a startup or shutdown occurs, shall not exceed any of the following:

- PM₁₀ 432 lbs/day
- SO₂ 86.4 lbs/day
- NO₂ 418.5 lbs/day
- VOC 96.0 lbs/day
- CO 326.7 lbs/day [District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-17 Emission rates from both CTGs (S-3523-1 and -2), on days when a startup or shutdown occurs for either or both turbines, shall not exceed any of the following:

- PM₁₀ 864.0 lb/day
- SO₂ 172.8 lb/day
- NO₂ 817.8 lb/day
- VOC 192.0 lb/day
- CO 640.4 lb/day. [District Rule 2201]

The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-18 Annual emissions from both CTGs calculated on a twelve (12) consecutive month rolling basis shall not exceed any of the following: PM10 -

315,360 lb/year, SO_x (as SO₂) - 57,468 lb/year, NO_x (as NO₂) - 285,042 lb/year, VOC - 64,478 lb/year, and CO - 223,040 lb/year. [District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-19 Each one-hour period in a one-hour rolling average will commence on the hour. Each one-hour period in a three-hour rolling average will commence on the hour. The three-hour average will be compiled from the three most recent one-hour periods. Each one-hour period in a twenty-four-hour average for ammonia slip will commence on the hour. The twenty-four-hour average will be calculated starting and ending at twelve-midnight. [District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-20 Daily emissions will be compiled for a twenty-four hour period starting and ending at twelve-midnight. Each calendar month in twelve-consecutive-month rolling emissions will commence at the beginning of the first day of the month. The twelve-consecutive-month rolling emissions total to determine compliance with annual emissions will be compiled from the twelve (12) most recent calendar months. [District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-21 Prior to or upon startup of S-3523-1-0, -2-0, & 3-0, emission offsets shall be surrendered for all calendar quarters in the following amounts, at the offset ratio specified in Rule 2201 (6/15/95 version) Table 1, PM₁₀ - Q1: 78,596 lb, Q2: 79,470 lb, Q3: 80,343 lb, and Q4: 80,343 lb; SO_x (as SO₂) - Q1: 14,170 lb, Q2: 14,328 lb, Q3: 14,485 lb, and Q4: 14,485 lb; NO_x (as NO₂) - Q1: 65,353 lb, Q2: 66,079 lb, Q3: 66,805 lb, and Q4: 66,805 lb; and VOC - Q1: 10,967 lb, Q2: 11,089 lb, Q3: 11,211 lb, and Q4: 11,211 lb. [District Rule 2201]

Verification: The owner/operator shall submit copies of ERC surrendered to the SJVUAPCD in the totals shown to the CPM prior to or upon startup of the CTGs or cooling tower.

AQ-22 NO_x and VOC emission reductions that occurred from April through November may be used to offset increases in NO_x and VOC respectively during any period of the year. [District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-21**.

AQ-23 NO_x ERCs may be used to offset PM₁₀ emission increases at a ratio of 2.42 lb NO_x: 1 lb PM₁₀ for reductions occurring within fifteen (15) miles of this

facility, and at 2.72 lb NO_x: 1 lb PM₁₀ for reductions occurring greater than fifteen (15) miles from this facility. [District Rule 2201]

Verification: The project owner shall provide records of the ERCs as part of Condition **AQ-21**.

AQ-24 At least thirty (30) days prior to the construction of permanent foundations, the project owner shall provide the District with:

- written documentation that all necessary offsets have been acquired or that
- binding contracts to secure such offsets have been entered into. [District Rule 2201]

Verification: The project owner shall provide ERC records as part of Condition **AQ-21**.

AQ-25 Compliance with ammonia slip limit shall be demonstrated by using the following calculation procedure: ammonia slip ppmv @ 15% O₂ = ((a - (bxc/1,000,000)) x 1,000,000 / b) x d, where a = ammonia injection rate(lb/hr)/17(lb/lb. mol), b = dry exhaust gas flow rate (lb/hr)/(29(lb/lb. mol), c = change in measured NO_x concentration ppmv at 15% O₂ across catalyst, and d = correction factor. The correction factor shall be derived annually during compliance testing by comparing the measured and calculated ammonia slip. Alternatively, the project owner may utilize a continuous in-stack ammonia monitor, acceptable to the District, to monitor compliance. At least 60 days prior to using a NH₃ CEM, the project owner must submit a monitoring plan for District review and approval [District Rule 4102]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-26 Compliance with the short term emission limits (lb/hr and ppmv @ 15% O₂) shall be demonstrated within 60 days of initial operation of each gas turbine engine and annually thereafter. On site sampling of exhaust gasses at full load conditions by a qualified independent source test firm, in full view of District witnesses, as follows:

- NO_x: ppmvd @ 15% O₂ and lb/hr;
- CO: ppmvd @ 15% O₂ and lb/hr;
- VOC: ppmvd @ 15% O₂ and lb/hr;
- PM₁₀: lb/hr; and
- ammonia: ppmvd @ 15% O₂.

Sample collection to demonstrate compliance with ammonia emission limit shall be based on three consecutive test runs of thirty minutes each. [District Rule 1081]

Verification: The project owner shall provide records of compliance as part of Condition **AQ-29**.

AQ-27 Compliance with the startup NO_x, CO, and VOC mass emission limits shall be demonstrated for one of the CTGs (S-3523-1, or -2) upon initial operation and at least every seven years thereafter by District witnessed in situ sampling of exhaust gases by a qualified independent source test firm. [District Rule 1081]

Verification: The project owner shall provide records of compliance as part of Condition **AQ-29**.

AQ-28 Compliance with natural gas sulfur content limit shall be demonstrated within sixty (60) days of operation of each gas turbine engine and periodically as required by 40 CFR 60 Subpart GG and 40 CFR 75. [District Rules 1081, 2540, and 4001]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-29 The District must be notified thirty (30) days prior to any compliance source test, and a source test plan must be submitted for approval fifteen (15) days prior to testing. Official test results and field data collected by source tests required by conditions on this permit shall be submitted to the District within sixty (60) days of testing. [District Rule 1081]

Verification: The project owner shall notify the CPM and the District thirty (30) days prior to any compliance source test. The project owner shall provide a source test plan to the CPM and District for the CPM and District approval fifteen (15) days prior to testing. The results and field data collected by the source tests shall be submitted to the CPM and the District within 60 days of testing.

AQ-30 Source test plans for initial and seven-year source tests shall include:

- a method for measuring the VOC/CO surrogate relationship that will be used to demonstrate compliance with VOC lb/hr, lb/day; and
- lb/twelve month rolling emission limits. [District Rule 2201]

Verification: The project owner shall provide a source test plan to the CPM and District for the CPM and District approval fifteen (15) days prior to testing. The results and field data collected by the source tests shall be submitted to the CPM and the District within sixty (60) days of testing.

AQ-31 The following test methods shall be used:

- PM₁₀: EPA method 5 (front half and back half),
- NO_x: EPA Method 7E or 20,
- CO: EPA method 10 or 10B, O₂: EPA Method 3, 3A, or 20,

- VOC: EPA method 18 or 25,
- ammonia: BAAQMD ST-1B, and
- fuel gas sulfur content: ASTM D3246.

EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081, 4001, and 4703]

Verification: The project owner shall provide records of compliance as part of Condition **AQ-29**.

AQ-32 The project owner shall notify District of the:

- date of initiation of construction no later than 30 days after such date;
- date of anticipated startup not more than 60 days nor less than 30 days prior to such date; and
- date of actual startup within fifteen (15) days after such date. [District Rule 4001]

Verification: Within thirty (30) days after such event, the project owner shall notify the CPM and the District of the date of initiation of construction.

Not more than sixty (60) days or less than thirty (30) days prior to such event, the CPM and the District shall be notified of the date of anticipated startup.

The CPM and the District shall be notified within fifteen (15) days after actual startup .

AQ-33 The project owner shall maintain hourly records of NO_x, CO, and ammonia emission concentrations (ppmv @ 15% O₂), and hourly, daily, and twelve month rolling average records of NO_x and CO emissions. Compliance with the hourly, daily, and twelve-month rolling average VOC emission limits shall be demonstrated by the CO CEM data and the VOC/CO relationship determined by annual CO and VOC source tests. [District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-34 The project owner shall maintain records of SO_x lb/hr, lb/day, and lb/twelve month rolling average emission. SO_x emissions shall be based on fuel use records, natural gas sulfur content, and mass balance calculations. [District Rule 2201]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-35 The project owner shall maintain the following records for the CTG: occurrence, duration, and type of any startup, shutdown, or malfunction; emission measurements; total daily and annual hours of operation; and hourly quantity of fuel used. [District Rules 2201 & 4703]

Verification: The project owner shall compile required data and submit the information to the CPM in quarterly reports submitted no later than thirty (30) days after the end of each calendar quarter.

AQ-36 The project owner shall maintain the following records for the continuous emissions monitoring system (CEMS): performance testing, evaluations, calibrations, checks, maintenance, adjustments, and any period of non-operation of any continuous emissions monitor. [District Rules 2201 & 4703]

Verification: The project owner shall provide records of compliance as part of the quarterly reports of Condition **AQ-35**.

AQ-37 All records required to be maintained by this permit shall be maintained for a period of five (5) years and shall be made readily available for District inspection upon request. [District Rule 2201]

Verification: The project owner shall make records available for inspection by representatives of the District, CARB and the Commission upon request.

AQ-38 Results of continuous emissions monitoring shall be reduced according to the procedure established in 40 CFR, Part 51, Appendix P, and paragraphs 5.0 through 5.3. 3, or by other methods deemed equivalent by mutual agreement with the District, the ARB, and the EPA. [District Rule 1080]

Verification: The project owner shall compile the required data in the formats discussed above and submit the results as part of the quarterly reports specified in Condition AQ-35.

AQ-39 Not later than one (1) hour after its detection, the project owner shall notify the District of any breakdown condition, unless the owner or operator demonstrates to the Districts satisfaction that the longer reporting period was necessary. [District Rule 1100]

Verification: The project owner shall comply with the notification requirements of the District and submit written copies of these notification reports to the CPM as part of the quarterly reports of Condition **AQ-35**.

AQ-40 The District shall be notified in writing within ten (10) days following the correction of any breakdown condition. The breakdown notification shall include a description of the equipment malfunction or failure, the date and cause of the initial failure, the estimated emissions in excess of those allowed, and the methods utilized to restore normal operations. [District Rule 1100]

Verification: The project owner shall comply with the notification requirements of the District and submit written copies of these notification reports to the CPM as part of the quarterly reports of Condition **AQ-35**.

AQ-41 Audits of continuous emission monitors shall be conducted quarterly, except during quarters in which relative accuracy and total accuracy testing is performed, in accordance with EPA guidelines. The District shall be notified prior to completion of the audits. Audit reports shall be submitted along with quarterly compliance reports to the District. [District Rule 1080]

Verification: The project owner shall submit the continuous emission monitor audit results with the quarterly reports required of Condition **AQ-43**.

AQ-42 The project owner shall comply with the applicable requirements for quality assurance testing and maintenance of the continuous emission monitor equipment in accordance with the procedures and guidance specified in 40 CFR Part 60, Appendix F. [District Rule 1080]

Verification: The project owner shall submit the continuous emission monitor results with the quarterly reports of Condition **AQ-43**.

AQ-43 Within thirty (30) days of the end of the quarter, for each calendar quarter, the project owner shall submit a written report to the APCO that includes:

- time intervals,
- data and magnitude of excess emissions,
- nature and cause of excess (if known),
- corrective actions taken and preventive measures adopted.

Averaging period used for data reporting shall correspond to the averaging period for each respective emission standard; applicable time and date of each period during which the CEM was inoperative (except for zero and span checks) and the nature of system repairs and adjustments; and a negative declaration when no excess emissions occurred. [District Rule 1080]

Verification: The project owner shall compile the required data and submit the quarterly reports to the CPM and the APCO within thirty (30) days of the end of the quarter.

AQ-44 The project owner shall submit an application to comply with Rule 2540 - Acid Rain Program twenty four (24) months before the unit commences operation. [District Rule 2540]

Verification: The project owner shall file their application with the District at least twenty four (24) months prior to the commencement of operation of any of the combustion turbine generators.

Conditions of Certification **AQ-45** through **AQ-52** apply to the following equipment:

FORCED DRAFT COOLING TOWER WITH 6 CELLS AND HIGH EFFICIENCY DRIFT ELIMINATOR S-3523-3-0:

AQ-45 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

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

AQ-46 At least thirty (30) days prior to commencement of construction, the project owner shall submit to the District:

- drift eliminator design details; and
- vendor specific emission justification for the correction factor to be used to correlate blowdown TDS to drift TDS and the amount of drift that stays suspended in the atmosphere utilizing the equation in Condition **AQ-51**. [District Rule 2201]

Verification: Thirty (30) days prior to commencement of construction of the cooling towers, the project owner shall submit the information required above to the District and the CPM.

AQ-47 The project owner shall submit to the District cooling tower design details (including the cooling tower type and materials of construction) at least thirty (30) days prior to commencement of construction, and, at least ninety (90) days before the tower is to be operated. [District Rule 7012]

Verification: Thirty (30) days prior to commencement of construction of the cooling towers, the project owner shall submit the information required above to the District and the CPM.

AQ-48 No hexavalent chromium containing compounds shall be added to cooling tower circulating water. [District Rule 7012]

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

AQ-49 Drift eliminator drift rate shall not exceed 0.0006%. [District Rule 2201]

Verification: The project owner shall submit documentation from the selected cooling tower vendor that verifies the drift efficiency to the CPM thirty (30) days prior to commencement of construction of the cooling towers.

AQ-50 PM₁₀ emission rate shall not exceed 9.3 lb/day. [District Rule 2201]

Verification: Please refer to Condition **AQ-51**.

AQ-51 Compliance with the PM₁₀ daily emission limit shall demonstrated as follows: PM₁₀ lb/day = circulating water recirculation rate * total dissolved solids concentration in the blowdown water * design drift rate * correction factor. [District Rule 2201]

Verification: The project owner shall compile the required daily PM₁₀ emissions data and maintain the data for a period of five (5) years. The project owner shall

make the site available for inspection by representatives of the District, CARB and the Commission.

AQ-52 Compliance with PM₁₀ emission limit shall be determined by circulating water sample analysis by independent laboratory within 90 days of initial operation and weekly thereafter. [District Rule 1081]

Verification: The project owner shall compile the required daily PM10 emissions data and maintain the data for a period of five (5) years. The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

Conditions of Certification **AQ-53** through **AQ-62** apply to the following equipment:

SAMPLE EQUIPMENT DESCRIPTION: 125 HP PERKINS/DETROIT DIESEL MODEL PDFP-06YR DIESEL-FIRED IC ENGINE DRIVING EMERGENCY FIRE WATER PUMP S-3523-4-0:

AQ-53 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

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

AQ-54 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]

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

AQ-55 The engine shall be equipped with a turbocharger and intercooler/aftercooler. [District Rule 2201]

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

AQ-56 The engine shall be equipped with an operational non-resettable hour meter. [District Rule 2201]

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

AQ-57 The engine shall be equipped with a positive crankcase ventilation (PCV) system or a crankcase emissions control device of at least 90% control efficiency unless UL certification would be voided. [District Rule 2201]

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

AQ-58 NO_x emissions shall not exceed 7.2 g/hp-hr. [District Rule 2201].

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

AQ-59 The sulfur content of the diesel fuel used shall not exceed 0.05% by weight. [District Rule 2201]

Verification: Please refer to Condition **AQ-62**.

AQ-60 Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

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

AQ-61 The engine shall be operated only for maintenance, testing, and required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory purposes shall not exceed 200 hours per year. [District Rules 2201 and 4701]

Verification: The project owner shall compile records of hours of operation of any of the IC engines and include those records as part of the quarterly reports submitted to the CPM under Condition **AQ-35**.

AQ-62 The project owner shall maintain records of hours of non-emergency operation and of the sulfur content of the diesel fuel used. Such records shall be made available for District inspection upon request for a period of five (5) years. [District Rules 2201 and 4701]

Verification: The project owner shall compile records of hours of operation of the IC engines and of the diesel fuel purchased that includes the sulfur content, and maintain the data for a period of five years. The project owner shall make the site available for inspection by representatives of the District, CARB and the Commission.

B. PUBLIC HEALTH

The Commission's analysis under the Public Health topic area supplements the analysis performed above under the discussion of Air Quality. This section focuses on exposure to pollutants for which no air quality standards have been established, so-called noncriteria pollutants. The purpose of the public health analysis is to assess whether a significant health risk would result from exposure to the airborne emissions of noncriteria pollutants.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The evidence is undisputed that operational emissions from the gas turbines and cooling towers, as well as ammonia emissions from the SCR system, constitute the primary source of potential impacts from noncriteria pollutants. (1/25 RT 56:18-57:10; Ex. 19, p. 21.) Acetaldehyde, benzene, 1,3 butadiene, formaldehyde, polycyclic aromatic hydrocarbons (PAHs), and propylene oxide were analyzed for both potential carcinogenic and noncarcinogenic health effects.⁶⁵ (Ex. 19, p. 25.) Exposure to these emissions creates the potential for cancer and noncancer health effects.⁶⁶ (1/25 RT 52:9-25; Ex. 19, p. 21.)

Testimony from both Applicant's and Staff's expert witnesses indicates that the project will not pose a significant adverse public health risk. (1/25 RT 52:7-53:3; 81:7-82:24.) CURE disagrees, asserting that the project will create acute, construction-related health risks from diesel exhaust emissions. (Ex. 25, p. 1.)

⁶⁵Ammonia, acrolein, naphthalene, toluene, xylenes and manganese were considered noncarcinogenic pollutants. (Ex. 19, p. 25.)

⁶⁶Health risks associated with a project can result from high-level exposure, which creates immediate onset (acute) effects, or from prolonged low-level exposure which creates chronic effects. (Ex. 19, p. 22.) Acute effects could occur only during major accidents for projects of this type; they are not expected from routine operations when emissions are much lower. (*Ibid.*) Long-term, chronic exposures are therefore of greater concern in assessing possible public health impacts. (*Ibid.*) Chronic effects from exposure to toxic emissions from natural gas combustion may manifest themselves as cancer or health effects other than cancer. (*Ibid.*)

CURE prepared and remodeled an acute risk assessment for the project's main construction site. Through this effort, CURE purportedly demonstrates significant construction impacts from two compounds in particular: acrolein and formaldehyde.⁶⁷ (Ex. 25, p. 2.) CURE's public health concerns about public health impacts from project construction nevertheless are moot. (1/25 RT 137:17-138:12.) Applicant has agreed, and we have imposed, a requirement that Applicant use oxidizing soot filters on construction equipment.⁶⁸ ((1/25 RT 54:21-56:17, 72:13-73-19; Ex. 25, p. 2; see Condition **AQ-C2**.)⁶⁹

The evidence indicates that the threshold of significance for sources of environmental carcinogens, which produce a potential cancer risk, is one in one million. (1/25 RT 52:7-53:3; Ex. 19, p. 23.) For noncarcinogenic pollutants, significant health impacts are considered unlikely when the hazard index estimate is less than 1.0. (Ex. 19, pp. 22-23.) Governmental regulatory agencies apply the above thresholds of significance for both acute and chronic effects. (1/25 RT, pp. 81:2-85:16, 87:23-89:25, 90:22-94:25; Ex. 19, pp. 22-23.)

Although calculated at the project's maximum operating conditions, the potential public health hazard risk due to both carcinogenic and noncarcinogenic pollutants is substantially below the 1.0 threshold level. (1/25 RT 52:7-53:3; Ex. 19, pp. 22-23.) A hazard index value of 0.014 was calculated for combined chronic health effects for the maximally exposed individual⁷⁰ who will have to be

⁶⁷A health risk assessment is used to evaluate the potential for adverse health effects. (Ex. 19, p. 22.)

⁶⁸ All parties agree that application of CO oxidation catalysts on project turbines, and oxidizing soot filters on project construction equipment would reduce the project's impacts on public health during construction and normal turbine operation to below levels of significance. (CURE's Reply Brief on Phase I issues, p. 15.)

⁶⁹ All Conditions of Certification which control project emissions are contained in the section of this Decision entitled **Air Quality**.

⁷⁰ The maximally exposed individual refers to a hypothetical person who is exposed to project emissions at the point of maximum impact, 24 hours a day, every day for 70 years.

located relatively near the project site (at a point approximately 1.1 kilometers to the northeast). (Ex. 19, p. 25.)

A value of 0.043 was calculated for combined acute health effects for such an individual who in this case will have to be located at a point approximately .25 kilometers to the west. (Ex. 19, pp. 25-26.) According to Staff and Applicant, these values demonstrate that significant noncancer health effects would be unlikely during operations. (Exs. 1, pp. 5.15-1-5.15-9; 19, pp. 25-26.)

Moreover, according to Staff and Applicant, since the project site is inaccessible to the general public and, since only workers would be found at the site, only worker exposure standards would be appropriate for impact assessment. (1/25 RT 67:12-68:6, 85:17-87:12.) For example, Applicant's witness testified that:

When we did the risk assessment we treated all individuals outside the 12 acre facility as the public, and used the worst case exposure assumptions of 70 years of continuous exposure. And we also applied the reference exposure levels to those individuals, even though they would be more representative of healthy workers and covered by other regulations. (1/25 RT 67:12-68-6.)

For the maximally exposed individual, the highest combined cancer risk was estimated to be 0.12 in a million. (Ex. 19, p. 26.) As with combined chronic health effects, the maximally exposed individual would have to be located near the plant site (1.1 kilometers to the northeast). (Ex. 19, p. 26.)

In addition to the Elk Hills Power Project, the permitted La Paloma project and the pending Sunrise and Midway-Sunset projects are proposed for construction and operation in western Kern County. (1/25 RT 76:24-80-4; Ex. 20.)⁷¹ These four projects, all of which will burn natural gas, are located about eight miles apart. (*Ibid.*) When toxic pollutants are emitted from multiple sources within a relatively small area, the combined impacts of such emissions could conceptually

⁷¹ See testimony of Dwight R. Mudry, Ex: 20, Attachment A, p. 3.

create significant public health impacts, although the impacts from an individual source are insignificant. (Ex. 19, p. 26.)

Here, the evidence of record establishes that the peak impacts would be localized within a relatively short distance from the source. (Exs. 1, p. 5.15-12; 19, p. 26.) Potentially significant cumulative impacts are expected only in situations where new sources are located adjacent to one another. (*Ibid.*) Thus, in the present situation and considering the distance between each of the proposed projects, the evidence establishes that the combined operation of these projects will not cause or contribute significantly to an adverse public health impact. (*Ibid.*)

COMMISSION DISCUSSION

Maximum impact for emissions from the Elk Hills project is at the approximate center of the OEHI operated Elk Hills Oil and Gas Field, an industrial environment from which the general public is excluded. (1/25 RT 85:17-87:12; Ex. 1, p. 5.15-1.) CURE, however, contends that oil field workers must be considered offsite workers who are protected by the same standards as those that protect the general public. (Ex. 25, p. 8.) We disagree.

First, the evidence demonstrates that the assessment of exposure risks for the oil field workers were quite conservative. As Applicant's testimony explained:

The most important uncertainties related to exposure include the definitions of exposed populations and their exposure characteristics. The choice of a residential maximally exposed individual (MEI) is very conservative in the sense that no real person is likely to spend 24 hours a day, 365 days a year over a 70-year period at exactly the point of highest toxicity-weighted annual average concentration. The greatest true exposure is likely to be at least 10 times lower than that calculated for the MEI. (Ex. 1, p. 5.15-10.)

Second the extremely conservative nature of Applicant's assessment substantially moots CURE's argument of potential harm to oilfield workers. It thus appears to us that these workers would be equally protected under either standard.

Third, the evidence establishes that western Kern County, where the plant is proposed for construction, has a population density of 19 persons per square mile.⁷² (Ex. 19, p. 20.) The proposed project is in the approximate center of the OEHI operated oil field and the point of maximum impact where exposures were estimated--is closed to public access. (1/25 RT 85:17-87:22, 136:12-137:3.) The nearest residence to the 12-acre proposed project site is located approximately 5.1 miles to the east, and there are no sensitive receptors within a six-mile radius of the site. (Ex. 19, p. 20-21.) Finally, the point of maximum impact for the pollutant emissions is more or less equally distant. (1/25 RT 117:2-20.)

Staff's witness Rick Tyler testified as follows:

It is my belief that by virtue of the fact that Occidental Chemical has incorporated this facility virtually in the center of their existing oilfield operations, that in fact they are obligated to protect their employees under existing Cal-OSHA regulations from any hazard that is introduced to them by this facility. As such, I believe the appropriate treatment of these individuals is--they should be treated as workers.

Additionally, I would point out that they are exposed to many--already exposed to many of the same hazards that --that they would be exposed to as a result of this facility, such as ammonia.

My belief is that there is --that there is not a reasonable justification for treating these individuals as public receptors. (1/25 RT 85:17-86:25.)

⁷² This is according to the 1990 U.S. census figures. (Ex. 19, p. 20.)

For all of these reasons, we conclude that the laws applicable to workers in the Elk Hills Oil and Gas Field are the identical laws that are applicable to on-site workers the Elk Hills Power Project.

FINDINGS AND CONCLUSIONS

Based on the evidence of record and assuming implementation of the Conditions of Certification contained in this Decision, we find and conclude as follows:

1. The primary potential adverse public health impact associated with the Elk Hills Power Project is due to combustion by-products from burning natural gas.
2. Combustion of natural gas results in emission of criteria and noncriteria pollutants.
3. As discussed in the Air Quality portion of this Decision, emissions of criteria pollutants will occur at levels that are consistent with those established to protect public health.
4. 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 public health effects.
5. The project's emissions of non-criteria pollutants will not cause acute or chronic adverse public effects.
6. Potentially significant cumulative impacts from noncriteria pollutants are localized within relatively short distances from the project source, at a point within the Elk Hills Oil and Gas Field.
7. Elk Hills operation, in combination with that of the licensed La Paloma and the proposed Sunrise and Midway Sunset projects, will not cause or contribute significantly to a cumulative adverse public health impact from noncriteria pollutant emissions.
8. Oil field workers in industrial areas adjacent to the project will be protected from adverse exposure to project emissions by implementation of existing regulations established by the California Occupational Safety and Health Administration (Cal-OSHA) to protect the health and safety of industrial workers.

9. Public health construction impacts from acrolein and formaldehyde will be adequately mitigated by the use of oxidizing soot filters on construction equipment.
10. The weight of evidence indicates that emissions from the Elk Hills Power Project will not have a significant negative impact on the public health.

We therefore conclude that emissions of noncriteria pollutants from the project will not pose a significant direct, indirect, or cumulative adverse public health risk.

C. HAZARDOUS MATERIALS MANAGEMENT

Public safety concerns may arise from the construction and operation of a proposed project, especially with respect to the handling, transportation, and disposal of hazardous materials. Therefore, the Commission examines each power plant proposal to determine if the facility is designed to ensure the safe handling and storage of these materials. (Related issues are also addressed in the Waste Management, Worker Safety, and Traffic and Transportation portions of this Decision). A list of hazardous materials and a summary of special handling precautions to be used by Applicant may be found in the AFC and the FSA. (Exs. 1, Table. 5.12-1, p. 5.12-6; 19, Appendix B.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

Several locational factors affect the potential of any project to cause adverse public health and safety impacts. These include the local meteorological conditions, terrain characteristics, any special site factors, and the proximity of population centers and sensitive receptors. (Ex. 19, pp. 61-62.) The evidence of record contains an examination of these factors in conjunction with the hazardous materials, which will be utilized at the project. The results of this examination indicate that one hazardous material, natural gas (fire and explosion), possesses a risk potential for off-site adverse impacts to the public. (Exs. 19, p. 62; 21F.)⁷³

⁷³ As we indicated earlier in the Introduction, Joint 1 requires Applicant to employ aqueous ammonia rather than the more volatile anhydrous ammonia. (Joint Ex. 1; 10/26 RT 14:21-16:25.) (Condition **HAZ-5**.)

Aqueous ammonia will be used in the selective catalytic reduction (SCR) system to control emissions of nitrogen oxides. (Joint Ex. 1.) The ammonia will be stored on the site in two 12,000-gallon storage tanks.⁷⁴ (Joint Ex. 1.)

The external hazards potentially affecting the ammonia storage tanks at this facility include earthquakes, fires, explosions, and turbine overspeed failure. (Ex. 19, p. 65.)⁷⁵ Staff has concluded that the potential for earthquake damage is sufficiently addressed by seismic code requirements. (*Ibid.*)

In addition to engineering steps, measures taken to reduce the risk of a release of ammonia or other hazardous chemical include the following:

- all liquid hazardous chemicals will be stored in tanks, which will have spill containment berms around them;
- incompatible materials such as caustics and acids will be separated in separate containment areas. (1/27 RT 153:13-154:2.)

1. Applicant

Applicant presented a panel of experts to introduce testimony on its plans for the use and handling of hazardous materials during construction and operation of the Elk Hills project.⁷⁶ Mr. Cronk in his testimony testified that:

- the quantities of hazardous materials to be used in the construction and operation of the Elk Hills project will be managed in accordance with applicable LORS;

⁷⁴ The cogeneration plant west of the proposed Elk Hills project, known as 35 R LOAP, is currently using and storing approximately 10,000 gallons of anhydrous ammonia and will continue to do so during the life of the Elk Hills project. (Ex. 19, p. 66.)

⁷⁵ Although Staff's analysis here applied to anhydrous ammonia, we find that it is equally applicable to the less volatile aqueous ammonia

⁷⁶ The panel consisted of Messieurs Gary Cronk, Joe Rowley, and Steven R. Radis. (1/27 RT 150:19-24.)

- the project will have very little potential to cause or contribute to cumulative impacts on hazardous materials handling in combination with the other local projects in western Kern. County. (Ex. 19, p. 151:1-154:2; Ex. 20.)

2. Staff

Staff has concluded that Applicant's use of aqueous ammonia was a major risk reduction and that the change to aqueous ammonia virtually precludes the probability of offsite impacts. (10/26 RT 15:22-16:2.)

3. CURE

Joint Exhibit 1 memorializes an agreement by Applicant and CURE on the proposed project's use of aqueous ammonia. In addition, Applicant and CURE have presented joint recommendations for revision of the Hazardous Materials Management Conditions [as well as those on the topics of Traffic and Transportation and Worker Safety] to effectuate Applicant's switch to aqueous ammonia. (RT 10:7-12-18; see 'Joint Exs. 1 & 2.)

COMMISSION DISCUSSION

We find that the proposed project's use of natural gas as a fuel, and use of aqueous ammonia, will pose no significant risk to worker or public health and safety. The CEC evaluated the potential impacts from the use of anhydrous ammonia at the proposed Elk Hills Power Project. Since that time, Applicant has decided to use aqueous ammonia, a less hazardous substance.

The Commission has evaluated numerous facilities proposing to use aqueous ammonia and has determined that the use of aqueous ammonia does not pose a significant risk to the public, onsite workers, or the environment.⁷⁷

In addition, the switch to aqueous ammonia will decrease the impact areas determined in the offsite consequence analysis and will decrease the consequences of a release. (1/27/00 RT 74:8-74:16; 156:18-156:20; 163:19-163:21; 222:2-222:8.) Because our analysis has found no significant impacts from the use of anhydrous ammonia with larger areas of potential consequences, we conclude that there will be no significant adverse environmental impact or health risk from the use of aqueous ammonia.

FINDINGS AND CONCLUSIONS

Based on the evidence of record concerning the topic area of Hazardous Materials Management, we find and conclude as follows:

1. The Elk Hills Power Project will use hazardous materials at the facility.
2. Hazardous materials to be used during the construction phase of the Elk Hills project include gasoline, diesel fuel, motor oil, hydraulic fluid, lubricants, solvents, cleaners, sealers, welding flux, paint, and paint thinner.
3. Hazardous materials to be used in substantial quantities during the operation phase of the Elk Hills project include natural gas and aqueous ammonia. Aqueous ammonia is the only hazardous material that will be stored, handled, and used on-site in reportable amounts.
4. The principal types of potential public health and safety hazards associated with the hazardous materials noted in Findings 2 and 3 above are the accidental release of ammonia gas and fire and explosion from natural gas.
5. The mitigation measures incorporated in the Conditions of Certification below will ensure that risks to public health and safety from hazardous materials are reduced to an insignificant level.

⁷⁷ See the CEC's Decisions for the LaPaloma Generating Project, and the Delta Energy/Los Medanos Energy Center.

6. The Elk Hills Power Project will not contribute to a cumulative risk to the public health and safety.
7. Implementation of the Conditions of Certification below will ensure that the Elk Hills Power Project will comply with the laws, ordinances, regulations, and standards related to hazardous materials management as specified in the appropriate portion of Appendix A of this Decision.

We therefore conclude that the hazardous materials used at the Elk Hills Power Project will not create or contribute to any significant adverse public health and safety impacts from the handling or storage of hazardous materials.

CONDITIONS OF CERTIFICATION

- HAZ-1** Unless approved in advance by the CPM, other than those identified in Appendix B, the project owner shall not use any hazardous material in reportable quantities--as specified in Title 40, Code Of Federal Regulations, Part 355, Subpart J, section 355.50. The proposed project shall not use anhydrous ammonia, but instead shall use aqueous ammonia with a concentration of less than 20%.⁷⁸ The proposed project shall not use anhydrous ammonia, but instead shall use aqueous ammonia with a concentration of less than 20%.⁷⁹

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

- HAZ-2** The project owner shall provide a Process Safety Management Plan as specified in Title 8, California Code of Regulations, section 5189 et seq. At a minimum, the project owner shall include a full description per the referenced code section:
- Operating procedures
 - Training
 - Initial training
 - Refresher/supplemental training
 - Certification and Testing
 - Mechanical Integrity

⁷⁸ See Joint Exhibit 1.

⁷⁹ See Joint Exhibit 1.

- Written Procedures
- Inspection and Testing
- Equipment Deficiencies
- Quality Assurance
- Management of Change
- Incident Investigation
- Emergency Planning and Response, and
- Employee Participation

Verification: At least 60 days prior to the delivery of any hazardous materials to the facility, the project owner shall provide the CPM with the project Process Safety Management Plan as referenced to code for approval.

HAZ-3 The project owner shall:

- Provide a Risk Management Plan (if otherwise required by law) and Process Safety Management Plan (as described in Condition **HAZ-2**) to the Kern County Environmental Health Department and the CPM for review and approval at the time the plans are first submitted to the U.S. Environmental Protection Agency (EPA) and the California Occupational Safety and Health Administration (Cal OSHA).
- Show all recommendations of the Kern County Environmental Health Department in the final document. A copy of the final plans, reflecting all comments, shall be provided to the Kern County Environmental Health Department and the CPM once reviewed by EPA and Cal OSHA.

Verification: At least sixty (60) days prior to the delivery of any hazardous materials to the facility, the project owner shall provide the final approved plans listed above for CPM approval. The project owner shall revise the Process Safety Management Plan and the Risk Management Plan as required by code.

HAZ-4 The project owner shall design and site the hydrogen storage facility so that it complies with the following conditions:

1. The hydrogen storage facility will consist of truck mounted carbon steel tanks with a total capacity of 60,000-scf and a working pressure in the range of 2,500 to 3,500 psia, suitable for storing and transporting hydrogen and will be compliant with the applicable American Society of Mechanical Engineer (ASME) pressure vessels codes, as well as the Department of Transportation (DOT) codes.

2. The tanks will be equipped with pressure relief valves.
3. The storage site will include crash posts placed appropriately to prevent vehicular accidents.
4. The storage site will be located such that it is at least 50 feet from any habitable structure, the combustion turbines and the aqueous ammonia storage facility.
5. The storage site will be placed in relation to the combustion turbines so that if an overspeed accident occurs, it will not have a significant potential to cause damage to the tanks.
6. The hydrogen tanks procedure for connection and disconnection will be included in the PSMP and RMP required by Conditions of Certification **HAZ-2** and **HAZ-3**.

Verification: At least 60 days prior to the delivery of hydrogen to the facility, the project owner shall provide the final detailed hydrogen storage plan to the CPM for approval. The hydrogen storage plan must be completed and submitted by a California licensed professional engineer.

HAZ-5 The aqueous ammonia storage facility shall include two tanks (12,000 gallons each) designed to either the ASME Pressure Vessel Code and ANSI K61.1 or to API 620. In either case, the storage tanks shall be protected by a secondary containment basin capable of holding 150% of the storage volume of one tank plus the volume associated with 24 hours of rain assuming 25 year storm.

Verification: At least 60 days prior to the delivery of aqueous ammonia to the facility, the project owner shall provide the final detailed aqueous ammonia storage plan to the CPM for approval. The aqueous ammonia storage plan must be completed and submitted by a California licensed professional engineer.

HAZ-6 The project owner shall provide a covered secondary containment to passively contain any spill during the delivery of aqueous ammonia to the storage facility.

Verification: At least sixty days prior to construction of the secondary containment basis described above, the project owner shall provide detailed design, drawings and specifications for the secondary containment basis to the CPM for review and approval.

HAZARDOUS MATERIAL MANAGEMENT Appendix A

Material	Use	Quantity Stored On-Site
Aqueous Ammonia	NOx emission control	24,000 Gallons
Organic Phosphate Inhibitor Solution	Circulating water scale control	4,000 Gallons
Sodium Hypochlorite Solution	Circulating water biofouling control	2,500 Gallons
Sulfuric Acid	Circulating water pH reduction and demineralizer regeneration	7,500 Gallons
Sodium Hydroxide	Demineralizer regeneration	7,500 Gallons
Oxygen Scavenger Solution	Condensate oxygen control	250 Gallons
Alkaline Solution (e.g. Amine)	Condensate pH control	250 Gallons
Disodium and Trisodium Hydrochloric acid	Boiler water scale control	1,000 Gallons
Ammonium Bifluoride	HRSG chemical cleaning	Temporary
Citric Acid	HRSG chemical cleaning	Temporary
EDTA Chelant	HRSG chemical cleaning	Temporary
Sodium Nitrate	HRSG chemical cleaning	Temporary
Diesel Fuel Oil	Diesel fire pump	100 Gallons
Sulfuric Acid	Station batteries	3,000 Gallons
Hydrogen	Generator cooling	60,000 standard cubic feet

EHPP 1999a, AFC Table 3.4-4, Page 3-4

D. WORKER SAFETY AND FIRE PROTECTION

Industrial workers use process equipment and hazardous materials on a daily basis. Accidents involving relatively small amounts of material can result in serious injuries. This topical analysis assesses the completeness and adequacy of the measures proposed by the Applicant to comply with applicable worker health and safety requirements.

SUMMARY OF THE EVIDENCE

1. Applicant

Applicant introduced the testimony of Mr. Roger Margotto, a Certified Industrial Hygienist, who sponsored various exhibits into evidence and summarized some of the mitigation measures that Applicant will apply to ensure the safety of its workers. (2/1/00 RT 10:21-12:3.) These will include:

- An Injury, Illness, and Prevention Plan;
- Requirements for the proper handling and storage of hazardous materials and related safety equipment;
- Implementation of employee training programs; and
- Implementation of a safety assessment program to review the effectiveness of the various safety programs.⁸⁰

Mr. Margotto noted that separate, comprehensive plans will be developed for the construction phase and the operation phase of the project. (Ex. 20, testimony of Roger Margotto. Attachment A, p. 2.) Each plan will consist of smaller plans, all of which will be submitted to Cal-OSHA for review and comment prior to implementation. (*Ibid.*; see also Condition **SAFETY-1**.) Overall, the witness expressed his agreement with the analysis and the Conditions of Certification recommended in the Staff FSA. (Ex. 20, Attachment A.) He testified that

⁸⁰ (Ex. 20, testimony of Roger Margotto, Attachment A, p. 2.)

construction and operation of the Elk Hills project would conform with all worker safety LORS. (*Ibid.*)

On the other hand, Mr. Margotto disagreed with the testimony filed on behalf of CURE, which asserted that workers would not be adequately protected. (Ex. 34.)⁸¹ First, in his prefiled testimony, Mr. Margotto demonstrated how the Elk Hills worker protection plans were intended to prepare workers for foreseeable risks at the work site. (5/16/00 RT 13:20-14:21; Ex. 20 [Margotto testimony], Att. A, p. 3.) Second, to dispute Dr. Fox's testimony concerning a lack of safety regulations to protect workers from potentially contaminated soils, Mr. Margotto cited Cal-OSHA construction safety orders. (2/1/00 RT 12:4-13:4.) According to Mr. Margotto, the construction safety orders refer to site contamination, and refer to other sections, which set permissible exposure levels (PELs) for workers, specifically in Title 8. (*Ibid.*)

As to PELs, Mr. Margotto testified that Cal-OSHA regulations specify the limits and he would apply those levels as a legal guideline in his assessments of the project work sites. (2/1/00 RT 15:21-16:15.) In applying those levels, Mr. Margotto stated that Applicant would refine the guidelines by setting an action level at 50 percent of the PEL. (*Ibid.*) At the 50 percent level, Applicant would begin to implement a workplace assessment to protect workers from exceeding a PEL. (*Ibid.*) Mr. Margotto testified that there are PELs for the types of contaminants Applicant could be expected to find during construction. (2/1/00 RT 16:15-17:2.) He stated that the Cal-OSHA PELs in many cases are more stringent than the federal standards. (*Ibid.*)

Moreover, to meet other of Dr. Fox's worker safety concerns, Mr. Margotto testified that:

⁸¹ See the Testimony of Dr. J. Phyllis Fox on waste management and worker safety impacts of the Elk Hills Power Project.

- (1) he could not quantify Dr. Fox's testimony regarding benzene effects in pounds/hour because that is not a proper measure of unit volume in the breathing zone of construction workers;
- (2) the primary route for contaminant exposure to workers is inhalation; and
- (3) Applicant would follow regulations, which require construction sites to provide places for workers to wash their hands and tools whenever contaminated soil might be present. (2/1/00 RT 17:3-24; Cf. Ex. 34, pp. 8.)⁸²

On cross-examination, Mr. Margotto stated that the worker safety assessment would be progressive. For example, if contaminated soils were discovered and they needed to be excavated, only those workers who had the specific level of training and equipment necessary or required would be working with the material. (2/1/00 RT 28:18-30:25.) Mr. Margotto answered that Applicant's hazards analysis contained in the health and safety plans would address hazards posed by soils contaminated with metals such as arsenic and chromium. (2/1/00 RT 30:6-31:14.) He stated that because preparation of the plans requires review of Applicant's overall construction plan, they could not be completed before the project's certification. (*Id.*; 33:8-34:13.)⁸³

Applicant's other worker safety witness, Gary Cronk, testified that the project site was a routine oil field construction site, rather than a known hazardous waste site. (2/1/00 RT 13:3-19.) Mr. Cronk stated that although contamination would not be expected, Applicant's safety and health plans would provide, with proper worker training and detection equipment, sufficient safety precautions for workers. (*Ibid.*) Mr. Cronk also disputed Dr. Fox's recommendation for a soil

⁸² Dr. Fox states that Dirt ingestion is often the major exposure route for construction workers. (Ex. 20, p. 8.)

⁸³ Mr. Rowley testified that the construction plan is best prepared by the engineering, procurement and construction (EPC) contractor for the project who has not been selected. (2/1/00 RT 34:17-37:6.)

analysis along the linear facilities prior to construction. (*Cf.* 2/1/00 RT 14:22-15:17; Ex. 34, p. 14.) Mr. Cronk stated that:

- (1) no known contamination along the linear facility sites,
- (2) no oil wells within 50 feet of the linear alignments,
- (3) wells contaminated with chromium were cleaned up,
- (4) all but one of the arsenic sites well pads were cleaned up,
- (5) the arsenic site not cleaned up is not near a linear facility,
- (6) workers performing excavation activities along linear routes would be trained, and that
- (7) there was no regulatory measure requiring Applicant to collect soil samples in advance of construction activities. (*Ibid.*)

Further, Mr. Cronk would not support Dr. Fox's recommendation that any worker safety environmental professional independently report to the CPM, rather than Applicant. (*Cf.* 2/1/00 RT 17:25-13; Ex. 34, pp. 10-12.) Moreover, Mr. Cronk disagreed with Dr. Fox's central assertion that oil field contamination cannot be identified through observation. (*Cf.* 2/1/00 RT 18:14-20:10; Ex. 34, pp. 9-11.)

Mr. Cronk stated:

- (1) his experience with eight to ten oil field remediation projects where crude oil was the predominant contaminant;
- (2) crude oil by its nature is a very heavy, dark oil, which is very distinct from the native soils, and the drilling mud made of clay so that pockets of contamination are easily detectable;
- (3) other contaminants referred to by Dr. Fox such as VOCs, polynuclear aromatics and heavy metals are typically associated with the crude oil at the site; and
- (4) likewise, natural gas products-similar to gasoline-would be easily detectable, by odor or by instrumentation. (*Ibid.*; 27:3-28-9; 31:21-33:7.)

Finally, Mr. Cronk disputed Dr. Fox's contention that if soil contamination is discovered at the site during excavation or construction, all construction activity should be halted. (*Cf.* 2/1/00 RT 20:11-21-4; Ex. 34, p. 12.) He testified that typically it is unnecessary to stop a construction project in mid-stream. (*Ibid.*) Rather, the owner would:

- (1) cover the contaminated soil to keep emissions down;
- (2) excavate known contaminated soil outside of the construction zone; and
- (3) sample the soil for evaluation and disposal, if necessary.
(Ibid.)

On cross-examination, Mr. Cronk noted that if contaminated soil were detected at the site (whether or not it was considered to be hazardous), the Kern County Environmental Health Department, the water quality control board, and the California Department of Toxic Substances Control (DTSC) would need to be notified. (2/1/00 RT 22:14-24:2.) He noted that although the Conditions of Certification do not specify monitoring equipment, or that an environmental health professional be located on site (as suggested by Dr. Fox in her testimony), these measures are typically required in the project's health and safety plans. (2/1/00 RT 25:7-22:24.) Mr. Cronk also stated on cross-examination that the health and safety officer at the site would have hazardous waste operations and emergency response (HAZWOPER) training. (2/1/00 RT 26:25-27:22.) He stated that other persons on site would have training commensurate with the level of any exposure. *(Ibid.)*

2. Staff

The Commission staff analysis of worker safety issues generally agreed with that of Applicant. Staff witness Rick Tyler testified that the Cal-OSHA regulatory scheme and the proposed Conditions of Certification in the Staff FSA will ensure that the Elk Hills project complies with LORS, and will provide adequate protection for workers. (2/1/00 RT 51:5-17; 58:11-17; Ex. 19, p. 31.) There are several components to Staff's conclusion and recommendation.

First, Staff relies heavily on the Phase I Environmental Site Assessment (Phase 1) determination that there was a low probability of significant contamination at

the site. (2/1/00 RT 41:14-18,⁸⁴ 53:5-9; 58:18-59:1; 60:14-61:9; FSA, App. H.) Second, in its analysis Staff relied on its determination that Elk Hills facility workers are indeed part of a larger workforce composed of OHEI workers in the surrounding Elk Hills oil fields. (2/1/00 RT 53:15-57:4.) In support of this analysis, Staff cites several factors it believes to weigh heavily in favor of its determination:

- the proposed Elk Hills project is located within the center of a privately owned and operated industrial complex that is generally closed to public access;
- workers at the complex are composed of healthy adults with exposure time limited generally by the 40-hour work week, as opposed to the much higher or stricter standards applied to members of the general public; and
- workers at the complex are subject to terms and conditions of employment that operate to ensure they receive proper training and equipment to control their exposure. (2/1/00 RT 53:15-57:9.)

Finally, Staff stated that, in view of the lack of any evidence of site contamination, there was no necessity for a health risk assessment. (2/1/00 RT 61:1-7.) Moreover, Staff suggested that, in the unlikely event contaminated soils are discovered, Conditions of Certification **WASTE-4** and **SAFETY-1** would effectively eliminate any significant worker exposure to contaminants. (2/1/00 RT 10:21-12:3.) Staff concludes that the Elk Hills project will pose no significant risk to workers and that adequate safety measures are contained in the recommended Conditions of Certification. (2/1/00 RT 58:11-59:1; 61:14-67:18.) Therefore, Staff argues that the mitigation measures advanced by CURE are unnecessary and not justified by the evidence of record.

⁸⁴ This portion of Staff's testimony was provided on the topic of waste management by Staff witness Mike Ringer. In addition, Mr. Ringer testified that, contrary to Dr. Fox's contention, the

3. CURE

In the process of discussing the positions taken by Applicant and Staff, we have summarized many of CURE s issues as well. To summarize again, CURE takes the position that the Elk Hills project will create significant impacts because:

- the Phase 1 was inadequate;
- the Phase 1 did not cover any of the linear facilities;
- construction workers will likely be exposed to contaminated soils and oil field wastes (particularly chromium and arsenic not associated with drilling muds) during project construction, where the main exposure route for construction workers is inadvertent ingestion of soils and dermal exposure due to a caking of soil on the skin;
- construction workers will not have the benefit of a DTSC standard practice worker risk assessment for contaminated sites that analyze inhalation, dermal and ingestion exposure routes;
- PEL s were not developed for construction workers digging in contaminated soils;
- a smell test is not an appropriate standard for detecting oil field contaminants at an active construction site because of a pervasive background odor of petroleum hydrocarbons and diesel in an oilfield environment;
- OSHA exposure standards should never be applied to workers outside the confines of the site;
- health and safety plans should be available before construction begins; and
- construction worker impacts have not been adequately mitigated by Staff s Conditions of Certification. (2/1/00 RT 69:2-129:22; Ex. 34.)

Elk Hills Phase 1 does not contain any statement concerning buried pipelines at the site, although

On cross-examination, Dr. Fox admitted that she had never visited the Elk Hills proposed site. (2/1/00 RT 107:23-25.) She defined certain terms used in her prefiled testimony such as contaminated would mean presence of chemicals above natural background, toxic are chemicals that are known to have adverse health effects. (2/1/00 RT 108:1-17.) Dr. Fox admitted that a Phase 1 typically relies on more than a visual survey. It also relies on record reviews, aerial photographs, and usually a site reconnaissance (visual observation). (*ibid.*)

In terms of Conditions, CURE recommends that the Commission require:

- (1) soil characterization and sampling work be done of soils that would be disturbed by project construction prior to construction;
- (2) a health risk assessment be prepared to determine whether any discovered contamination will threaten workers;
- (3) remediation should be carried out in all areas, which are determined to be hazardous; and,
- (4) health and safety plans should be implemented to address previously unidentified contamination encountered during construction. (2/1/00 RT 103:8-113:22; Ex. 34, p. 14; Ex. 21 I; CURE s Opening Brief on Phase I issues, pp. 27-28.)

COMMISSION DISCUSSION

There is no dispute regarding the fact that contaminated soil is likely to be found at the construction site and possibly the linear facilities. However, as noted in the testimony before the Committee, Staff does not believe any extraordinary conditions are present at the Elk Hills site rendering the Conditions of Certification inadequate to protect worker safety. Although CURE has presented evidence of formerly toxic sites surrounding the proposed site and linear facilities,

such a statement may be found in the Sunrise Phase 1. (2/1/00 RT 48:20-49:3.)

there is no direct evidence of site contamination at these locations. Indeed, Staff points out that the water and gas supply pipelines will be located in existing corridors. (2/1/00 RT 46:2-9.)

Accordingly, this matter is far different from the example relied on by Dr. Fox in her testimony. (Ex. 34, Apps. F-G.) Dr. Fox discussed the U.S. Courthouse building on the Southern Pacific Railroad rail yards, which involved a site previously determined to be contaminated to a degree that required intervention by the DTSC.

Our case is far different than the one Dr. Fox is relying on involving the U.S. Courthouse building in Sacramento. Primarily the proposed site here has not been determined to be contaminated at all. In fact the opposite is true. In assessing the project site here, DTSC concluded as follows:

The Department of Toxic Substance Control (DTSC) has reviewed the application for certification dated February 16, 1999... .

Based on our review we have determined that the proposed project is not within the areas of concern identified by DTSC report titled Naval Petroleum Reserve No. 1, Elk Hills, California, Resource Conservation and Recovery Act Facility Assessment dated June 30, 1998. Therefore, DTSC has no comment on the proposed project. (Ex. 34.)

Elk Hills and Staff experts both testified that the Elk Hills project would comply with all LORS, which are applicable to worker health and safety. (12/3/99 RT 58, 60.) Although CURE may disagree with the effectiveness of the LORS, its presentation at the hearing fell short of demonstrating the inadequacy of LORS to perform their intended function.

Furthermore, the weight of evidence demonstrates that the applicable LORS are also adequate to protect oil field workers outside the boundaries of the Elk Hills project from any project-related soil contaminants. These standards are

designed to protect oil field workers against direct contact with petroleum and other toxic chemicals present in the oil field. Expert testimony makes clear that these standards will also protect the workers from risks associated with soil soaked by these identical chemicals which oil field workers regularly encounter. Thus, the Committee is convinced that the applicable Cal-OSHA standards, and as reinforced by the Conditions, are appropriate and adequate to protect workers from the risks associated with potential soil contaminants.

Our conclusion rests in part on the fact that the project site, linear facilities and the adjacent oil field are industrial sites restricted to public access. As such, many of the standards designed to protect the general public, and which CURE seeks to apply to this project, are simply unsuitable. Consequently, the evidence demonstrates that, with mitigation required in the Conditions of Certification, the site does not pose a significant health risk to construction workers.⁸⁵

FINDINGS AND CONCLUSIONS

Based upon the evidence of record regarding the topic of worker safety, we find and conclude as follows:

1. The California Department of Toxic Substances Control has reviewed the Application for Certification of the Elk Hills Power Project.
2. Title 8, California Code of Regulations, sections 450 et seq. contain construction Safety Orders, General Industry Safety Orders, a Petroleum Safety Order, and other safety requirements which are applicable to the Elk Hills Power Project, to work within a -mile radius of the project site, and to work along linear facilities.
3. Compliance with existing applicable LORS will adequately assure protection of worker health and safety during the construction and operation phases of the Elk Hills Power Project.

⁸⁵ The Commission has clarified Condition of Certification **SAFETY-1**, as proposed by the parties in their comments and in Joint Exhibits 1 and 2, to make clear our requirements for site monitoring.

4. In order to comply with applicable requirements, Applicant must prepare and submit safety and health programs for the project's construction and operation phases.
5. The Conditions of Certification below require the submission and review of safety and health programs for the construction and operation phases.
6. Assuming compliance with the Conditions of Certification contained in this Decision, the project will comply with all LORS intended to protect worker health and safety and identified in the appropriate portion of Appendix A of this Decision.

We therefore conclude that the Elk Hills Power Project will adequately address worker safety and fire protection matters during the construction and operation phases.

CONDITIONS OF CERTIFICATION

SAFETY-1 The project owner shall submit to the CPM a Project Construction Safety and Health Program, which shall include:

- A Construction Injury and Illness Prevention Program (IIPP)
- A Construction Fire Protection and Prevention Plan (FPPP)
- A Personal Protective Equipment Program (PPEP)

Protocol: The Construction IIPP and the PPEP shall be submitted to the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders. The on-site Health and Safety Coordinator (HSC) assigned to the proposed project during excavation and grading activities shall be a California-certified Registered Environmental Assessor Class II (REA-II).⁸⁶

The REA-II shall perform a records review and field study to confirm that no contaminated sites will be encountered during construction of the proposed project. In order to protect workers from potential health hazards associated with encountering crude-oil impacted soils, the

⁸⁶ Changes referring to REA-II are a result of the Joint Agreements between Applicant and CURE. (See Joint Exs. 1 & 2.)

Construction Injury and Illness and Prevention program shall include the following safe work procedures:

1. The HSC will be identified and assigned to the site on a full-time basis. The HSC will be responsible for assessing potential hazards to workers if crude-oil impacted soil is encountered during grading and excavation activities being performed at the site. The HSC will have available, real-time air monitoring equipment (photoionization detector [PID] or flame ionization detector [FID] and a real time air borne particulate monitor to use to evaluate potential airborne chemical hazards.
2. Prior to beginning rough grading operations at the site, operators of heavy equipment (graders, loaders, excavators, etc.), surveyors and spotters will receive hazard recognition training from the selected HSC. The training will include:
 - Recognition of crude-oil impacted soils;
 - Potential health hazards associated with crude—oil impacted soils;
 - Procedures to control potential exposures; and
 - A response procedure if crude oil impacted soil is recognized.
3. Safe work procedures will be developed and implemented for instances when crude-oil impacted soils (or other suspect) soils are encountered. These procedures will include:
 - Back equipment away from the recognized area to an upwind location;
 - Contact the on-site HSC;
 - Control access by other workers/equipment to the location;
 - The HSC, using the on-site real-time air monitoring equipment, will assess potential airborne chemical hazards; and
 - If worker breathing zone airborne chemical concentrations are identified that exceed established response criteria (e.g., 50% of the Cal/OSHA Permissible Exposure Limit for the highest hazard chemical potentially present [e.g., benzene PEL=1 ppm] the source

will be barricaded and work will be moved to another location until the HSC makes a determination.

- Based upon the results of the real-time air monitoring and the estimated quantity of impacted soil, the HSC will have the authority to make an action determination regarding the identified soil and will coordinate with the Environmental Professional identified in Condition of Certification **WASTE-4**. Potential action determinations include:
 - Implementing an established contract with a local, certified hazardous waste removal contractor to remove the material;
 - Directing the removal and stockpiling of the materials by, trained (Hazardous Waste Operations and Emergency Response [HAZWOPER]) personnel; and
 - No action, continue work.
4. Dust control measures and/or PPE (e.g., respiratory protection [disposable dust, fume & mist respirators]) will also be implemented to minimize potential worker exposures to particulate hazards that may develop at the site during aggressive grading activities and/or windy conditions. The HSC will be responsible for initiating the dust control procedures based upon visual observations.

The Construction Fire Protection and Prevention Plan shall be submitted to the KCFD for review and acceptance.

Verification: Thirty days prior to the start of construction, or a lesser period of time as mutually agreed to by the project owner and the CPM, the project owner shall:

- (1) submit to the CPM a copy of the Project Construction Safety and Health Program and the PPEP, with a copy of the cover letter of transmittal of the plan to CAL-OSHA;
- (2) provide a letter from the KCFD stating that they have reviewed and accept the Construction Fire Protection and Prevention Plan; and
- (3) submit to the CPM the name, qualifications, statement, and certification/registration number of the Health and Safety Coordinator.

SAFETY-2 The project owner shall submit to the CPM a Project Operation Safety and Health Program containing the following:

- An Operation Injury and Illness Prevention Plan.

- An Emergency Action Plan.
- An Operation Fire Protection Plan.
- A Personal Protective Equipment Program.

Protocol: The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the Cal-OSHA Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders.

Protocol: The Operation Fire Protection Plan and the Emergency Action Plan shall be submitted to the KCFD for review and acceptance.

Verification: At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the final version of the Project Operation Safety & Health Program. It shall incorporate Cal-OSHA's Consultation Service comments, stating that they have reviewed and accepted the specified elements of the proposed Operation Safety and Health Plan.

The project owner shall notify the CPM that the Project Operation Safety and Health Program (Injury and Illness Prevention Plan, Fire Protection Plan, the Emergency Action Plan, and Personal Protective Equipment requirements), including all records and files on accidents and incidents, is present on-site and available for inspection.

SAFETY-3 The project owner shall design and install all exterior lighting to meet the requirements contained in the Visual Resources Conditions of Certification and in accordance with the American National Standards Practice for Industrial Lighting, ANSI/IES-RP-7.

Verification: Within 60 days after construction is completed, the project owner shall submit a statement to the CPM that the illuminance levels contained in ANSI/IES RP-7 were used as a basis for the design and installation of the exterior lighting.

VII. ENVIRONMENTAL ASSESSMENT

As part of its statutory mandate, the Commission must analyze a project's potential effect upon various elements of the human and natural environments.

A. BIOLOGICAL RESOURCES

Our examination of biological resources focuses upon impacts to state and federally listed species, species of special concern, wetlands, and other areas of critical biological interest in the project vicinity. Here we summarize the potential biological resources impacts due to the project and its related facilities, and address the adequacy of mitigation measures necessary to reduce any identified impacts to less than significant levels.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The proposed site is within the Elk Hills Oil and Gas Field, which is located in the southern San Joaquin Valley in southwestern Kern County. (Ex. 19A, Part II, p. 3.) The transmission line route alternatives and the pipeline routes (water, wastewater, and natural gas) are planned along existing transmission lines, pipelines, and roads; all project facilities and routes will be located almost entirely within the Elk Hills Oil and Gas Field. (*Id.*, at p. 5; 3/9 RT 18:9-17.)

Biotic communities at Elk Hills are composed primarily of species highly adapted for arid environments. (Ex. 19A, Part II, p. 3.) **Biological Resources Table 1** below shows special status species identified by surveys to occur within the project site and linear facilities.

Special Status Species Found Within the Proposed Project Area

Common Name	Scientific Name	Status¹ Federal/State/CNPS	Observed During Surveys
Plants			
Heartscale	<i>Atriplex cordulata</i>	SC/--/1B	Yes
Crownscale	<i>Atriplex coronata</i>	--/--/4	Yes
Lost Hills crownscale	<i>Atriplex vallicola</i>	SC/--/1B	Yes
Gypsum-loving larkspur	<i>Delphinium gypsophilum</i> spp. <i>Gypsophilum</i>	--/--/4	Yes
Recurved delphinium	<i>Delphinium recurvatum</i>	SC/--/1B	Yes
Hoover s eriastrum	<i>Eriastrum hooveri</i>	T/--/4	Yes
Cottony buckwheat	<i>Erigonum gossypinum</i>	--/--/4	
Temblor buckwheat	<i>Erigonum temblorense</i>	SC/--/1B	
Tejon poppy	<i>Eschscholzia lemmonii</i> ssp. <i>Kernensis</i>	--/--/4	Yes
Oil nest straw	<i>Stylocline citroleum</i>	SC/--/1B	Yes
San Joaquin bluecurls	<i>Trichostema ovatum</i>	--/--/4	
Wildlife			
Mammals			
San Joaquin antelope squirrel	<i>Ammospermophilus nelsoni</i>	SC/T	Yes
Giant kangaroo rat	<i>Dipodomys ingens</i>	E/E	Yes
Short-nosed kangaroo rat	<i>Dipodomys nitratoides brevinasus</i>	SC/CSC	Yes
Southern grasshopper mouse	<i>Onychomys torridus ramona</i>	SC/CSC	
San Joaquin pocket mouse	<i>Perognathus inornatus</i>	SC/CSC	Yes
Badger	<i>Taxidea taxus</i>	--/CSC	Yes
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	E/T	Yes
Birds			
Sharp-shinned hawk	<i>Accipiter striatus</i>	--/CSC	Yes
Tricolored blackbird	<i>Agelaius tricolor</i>	SC/CSC	
Golden eagle	<i>Aquila chrysaetos</i>	--/CSC	
Short-eared owl	<i>Asio flammeus</i>	--/CSC	Yes
Western burrowing owl	<i>Athene cunicularia hypugea</i>	SC/CSC	Yes
Red-tailed hawk	<i>Buteo jamaicensis</i>	--/--	Yes
Swainson s Hawk	<i>Buteo swainsoni</i>	T/CSC	
Northern harrier	<i>Circus cyaneus</i>	--/CSC	Yes
Horned lark	<i>Eremophila alpestris actia</i>	--/CSC	Yes
Merlin	<i>Falco columbarius</i>	--/CSC	
Prairie falcon	<i>Falco mexicanus</i>	--/CSC	Yes
Loggerhead shrike	<i>Lanius ludovicianus</i>	SC/CSC	Yes
LeConte s thrasher	<i>Plegadis chihi</i>	SC/CSC	Yes
Amphibians/Reptiles			
Southwestern pond turtle	<i>Clemmys marmorata pallida</i>	SC/CSC	
Blunt-nosed leopard lizard	<i>Gambelia sila</i>	E/E	Yes
San Joaquin coachwhip	<i>Masticophis flagellum ruddocki</i>	SC/CSC	Yes
California horned lizard	<i>Phrynosoma coronatum frontale</i>	T/T	

¹Federal Status

E — Endangered

T — Threatened

SC — Species of Special Concern

State Status

E — Endangered

T — Threatened

CSC — California Species of Special Concern

CNPS

1B — rare, threatened, or endangered in California and elsewhere

4 — limited distribution — A watch list.

Source: (Ex. 19A, p. 4.)

Some species are common and evenly distributed throughout the area, while others are less common and have irregular distributions. (Ex. 19A, Part II, p. 6.) Short-nosed kangaroo rats, kit foxes, and Hoover's eriastrum can be expected to occur throughout the project area. (*Ibid.*) Blunt-nosed leopard lizards and giant kangaroo rats inhabit areas with low topographic relief and sparse vegetation. (*Ibid.*) Populations fluctuate in response to weather patterns and land uses, and therefore, the numbers sighted from surveys can vary greatly from year to year. (*Ibid.*) In addition to species listed under each project component below, the following species were observed on numerous occasions along the survey corridors of the transmission line routes and water supply pipeline: loggerhead shrikes, great-horned owls, burrowing owls, and barn owls. (Ex. 19A, Part II, p. 6.) There were also a few sightings of bobcat, badger, and short-eared owls. (*Ibid.*)

The southern San Joaquin Valley has experienced severe declines in natural habitat since the early 1900s. (Ex. 19A, Part II, p. 3.) The predominant vegetation type (98% of the Elk Hills) is valley saltbush scrub and non-native annual grass.⁸⁷ (*Ibid.*) Low elevation areas with alkali soils support a mixture of valley saltbush scrub and an alkali sacation association characterized by bush sweepweed. (*Ibid.*)

Extant habitats in the southern San Joaquin Valley generally occur as small, highly fragmented parcels. (Ex. 19A, Part II, p. 5.) Elk Hills, along with adjacent lands known as the Buena Vista Valley and the Lokern Natural Area, represents the largest contiguous area of extant habitat remaining in the southern San Joaquin Valley. (*Ibid.*) This block of habitat has been identified by U.S. Fish and Wildlife Service (USFWS) as crucial to the recovery or conservation of eleven species. (*Ibid.*) These are: Hoover's eriastrum, oil nest straw, Tejon poppy, blunt-nosed leopard lizard, giant kangaroo rat, short-nosed kangaroo rat, San Joaquin kit fox, San Joaquin woolly threats, San Joaquin antelope squirrel, Tulare grasshopper mouse, and San Joaquin LeConte's thrasher

⁸⁷ Much of the Elk Hills is developed for oil and gas production, particularly in the lower elevations. (Ex. 19A, Part II, p. 3.) Unlike the nearby intensively developed Midway-Sunset oil field, the density of surface disturbance at Elk Hills is moderate in the flat areas to low in the hilly terrain. (*Ibid.*)

(scientific names provided in **Biological Resources Table 1**). Elk Hills is the only known location for the occurrence of oil nest straw. (*Ibid.*)

Several conservation areas and mitigation banks have been established or identified in the area immediately surrounding Elk Hills. (Ex. 19A, Part II, p. 5.) These include the Coles Levee Ecosystem Preserve, the Lokern Natural area, the Occidental of Elk Hills, Inc., Conservation Area, and the Buttonwillow Ecological Reserve. (*Ibid.*) Lands owned by the Bureau of Land Management (BLM) in the Lokern Natural Area are designated as an Area of Critical Environmental Concern. (*Ibid.*)

Before the federal government's sale of Elk Hills (formerly NPR-1) to OHEI, biological resources in the project area were extensively surveyed and documented for federal and state listed plant and animal species. (3/9 RT 18:18-19:1; Ex. 19, Part II, p. 5.)⁸⁸ The Department of Energy (DOE) performed the documentation under requirements set forth in three federal biological opinions. (Ex. 19, Part II, p. 5.)

Sale conditions included the transfer of a 1995 Biological Opinion which, among other things, required OHEI to place 7,075 acres of land as protected, undisturbed endangered species habitat. (Ex. 19A, Part II, pp. 5, 8.) This area was set aside to compensate for all *previous* permanent surface disturbances on the Elk Hills Oil and Gas Field. (*Ibid.*) The 1995 Biological Opinion predates by some four years the construction and operation of the proposed project. Even so, existing *disturbed* lands in the Elk Hills Oil and Gas Field have already been compensated for in the sale agreement between OHEI and USFWS.⁸⁹ (*Ibid.*)

⁸⁸ Applicant's wildlife biologist, Mr. Westley Rhodehamel, testified that these previous surveys were reviewed to assist the project to determine locations that would minimize impacts to biological resources. (3/9 RT 18:18-19:1.)

⁸⁹ It is understood that *disturbed lands* provide suitable habitat for some special status species such as the kit fox and Hoover's eriastrum. (Ex. 19A, Part II, pp. 7-8.) Because the compensation area provided in the OHEI purchase agreement is managed for the protection of the listed species within the Elk Hills Oil and Gas Field, no further mitigation for *disturbed lands* is required. (*Ibid.*)

1. Impacts

The proposed project will result in permanent loss of habitat from the footprints of the project components and temporary loss of habitat from construction activities. (Ex. 19, Part II, pp. 8-9; see **Biological Resources Table 2**, below.)

Staff's witness, Ms. Linda Spiegel, testified that loss of habitat from the project footprint is estimated to be around 15 acres for permanent displacement and around 39 to 50 acres for temporary displacement. (3/9 RT 36:16-18.) In terms of disturbances to conservation areas, 3.08 acres will be impacted permanently, and 8.09 acres temporarily disturbed. (Ex. 19A, Part II, p. 9.)

The Conservation Management Agreement/Declaration of Restrictions for the Elk Hills Conservation Area (CMA) requires a minimum of 7,075 acres to be protected for listed species. (Ex. 19A, Part II, p. 9.) The CMA also restricts the amount of surface disturbance to 10 percent per quarter section. (*Ibid.*) The CMA currently has 7,801 acres protected. (*Ibid.*)

Therefore, the proposed new 0.02 acres of permanent surface disturbance from the transmission line will not reduce the conservation area below minimum requirements.⁹⁰ (Ex. 19A, Part II, p. 9.) Likewise, anticipated new permanent surface disturbances (0.02 acres) and temporary surface disturbances (6.23 acres) from the transmission line (1B and 1B Variation) will not exceed the 10 percent limitation (16 acres per quarter section).⁹¹ (Ex. 19A, Part II, pp. 9-10.)

⁹⁰ The project's proposed injection wells and wastewater pipeline are located outside of the CMA. (Ex. 19A, Part II, p. 10.) The water supply line will cross 0.7 miles of land within the Coles Levee Preserve. (*Ibid.*) This area is owned by the CDFG and Applicant will need to obtain a right-of-way agreement. (*Ibid.*) Lands temporarily disturbed by the construction of the water line will require compensation at a ratio of 1:1, if not already allocated as preserve lands, or at a ratio of 2.1:1, if already allocated as preserve lands. (*Ibid.*)

⁹¹ According to Applicant, maintenance activities for the transmission lines will be infrequent and only result in temporary disturbance. Access roads will not be maintained or graded after construction and the construction laydown areas, pullsites, and access spurs are included in the surface disturbance estimates in Biological Resources Table 2. (*Ibid.*)

BIOLOGICAL RESOURCES Table 2
Permanent and Temporary Surface Disturbance (acres)⁹²

	Project Requirements	Existing Surface Disturbance	New Permanent Surface Disturbance	New Temporary Surface Disturbance
Power Plant, Laydown, Access Rd	17.0	14.12	2.88	0.0
Gas Pipeline	1.80	1.80	0.0	0.07
Water Disposal Line	15.0	14.99	0.01	8.63
Water Source Line	36.5	24.88	11.67	20.52
Transmission Line				
Route 1A	1.70	0.01	1.69	14.87
Route 1B	0.1	0.04	0.06	9.93
Variation 1B			0.04	22.61
Totals:				
Route 1A	72.0	55.75	16.25	44.09
Route 1B	70.4	55.78	14.62	39.15
Route 1B Variation	NA	NA	14.60	51.83

Source: (Ex. 19A, Part II, p. 9.)

Because many wildlife species use dens or burrows for shelter or to escape from potential harm, construction activity surface disturbances may cause them to be taken inadvertently leading to species mortality. (Ex. 19A, Part II, pp. 10.) Wildlife may also be trapped in open trenches or hit by construction vehicles, plants located in construction routes may be destroyed, and bird mortality may occur from collisions with transmission lines. (*Ibid.*)

Numerous occurrences of sensitive biological resources were found within the project s facilities survey corridors, particularly the linear facilities. (3/9 RT 18:18-20:4; Ex. 19A, Part II, p. 10.) These occurrences were documented within 1,100-foot survey corridors surrounding the centerlines of the transmission line routes and 500-foot survey corridors surrounding the centerlines of the pipeline routes. (*Ibid.*) Species directly impacted by project construction would be those with habitat within the construction corridors: kit fox

⁹² To determine acres of disturbance, Applicant assumed a 40-foot construction corridor along all linear facilities. Table 2 provides a summary of project-related and previous surface disturbances. Table 2 figures are based on a 12 acre power site; 5 acre laydown and access road; a gas pipeline length of 640 feet, 10,000 sq. ft. per power pole (including an area required for 100 sq. ft. per pole and equipment parking), line pulling, and tensioning; 20-ft access road width, where necessary, to pole sites; and, 54 poles for line 1A, 26 poles for line 1B, and 23 poles for Variation B (not including poles placed in non-natural habitat).

dens, blunt-nosed leopard lizard burrows, and stands of Hoover s eriastrum. (*Ibid.*; see **Biological Resources Table 3** below.).

BIOLOGICAL RESOURCES Table 3
Sensitive Species Observed Within the Construction Corridors

Linear Feature	Corridor Width	Potential Kit Fox Dens	Known Kit Fox Dens	Hoover s Eriastrum	Blunt-nosed Leopard Lizard
Plant Site	17 acres	3	0	0	0
Water Supply	40 ft	22	3	24	0
Wastewater	40 ft	4	0	3	0
Transmission Line					
Route 1A	100 ft	10	0	42	0
Route 1B	100 ft	4	0	8	0
Route 1B Var.	100 ft	3	0	7	0

Source: (Ex. 19A, Part II, p. 11.)

Staff believes that the information provided by surveys conducted to date is sufficient to determine potential occurrences of all sensitive species. (Ex. 19A, Part II, p. 11.) Preconstruction surveys as close in time to the beginning of construction as possible, however, are routinely used by all resource agencies to identify more precisely locations of:

- sensitive species; and
- avoidance areas. (*Ibid.*)

For example, Staff believes there is an underestimate of potential blunt-nosed leopard lizard (BNLL) occurrences along the linear facilities because of seasonal and other prevailing conditions during surveys for biological resources.⁹³ (Ex. 19A, Part II, p. 11.) (*Ibid.*) Unusually cool temperatures during this time may have reduced BNLL activity as only three BNLL were observed (one along the transmission line Route 1A and two along the water supply route). (*Ibid.*)

Accordingly, Applicant has stated that additional surveys will be conducted to determine BNLL occurrences; surveys will follow California Department of Fish and Game (CDFG) protocol. (3/9 RT 16:9-17:5; Ex. 19A, Part II, p. 7.) Mr. Rhodehamel testified that he

⁹³ Surveys for BNLL were conducted during April 1999, and Transmission line route Variation 1B surveys were conducted in early September. (Ex. 19A, Part II, p. 11.) BNLL may be inadvertently taken in their burrows by construction activities, particularly during their inactivity period when temperatures are below 75°F and above 95°F. (*Ibid.*)

believed Applicant would conduct preconstruction spring surveys for Transmission Line Route 1B, and confirmatory surveys in the March-May timeframe. (3/9 RT 16:17-5; 18:3-6.)

Power plant emissions will arise from water for the cooling towers. (Ex. 19A, Part II, p. 11.) Shown in Table 4 below are water quality characteristics of the:

- source water;
- cooling tower blowdown; and
- annual deposition rates from the cooling tower drift on surrounding vegetation. (*Ibid.*; see **Biological Resources Table 4.**)

Deposition rates of the inorganic constituents (fluoride, arsenic, iron, boron, and silica) are well below levels found typically in native soils. (Ex. 19A, Part II, p. 11.) Salt deposition rates are well below levels known to cause stress to salt-sensitive plants species (agricultural crop species). (*Ibid.*) The dominant species found on Elk Hills and adjacent lands is Atriplex, which is alkaline tolerant. (*Ibid.*) Therefore, no significant impact to vegetation from cooling tower drift is expected. (*Ibid.*)

BIOLOGICAL RESOURCES Table 4
Water Quality Characteristics and Annual Deposition Rate

Parameter	WKWD (Source) (mg/l)	Cooling Tower Blowdown (mg/l)	Annual Deposition Rate (g/m ² /yr)
Total Dissolved Solids	196.0	1,241.1	0.00710
Calcium	22.5	97.1	0.00082
Magnesium	1.4	4.1	0.00005
Sodium	35.9	336.5	0.00130
Potassium	0.8	14.2	0.00003
Bicarbonate	117.0	100.0	0.00424
Sulfate	21.5	285.6	0.00078
Chloride	19.8	257	0.00072
Nitrate	<2.0		<0.00007
Fluoride	0.0003	0.0018	0.00001
Arsenic	0.0048	0.030	1.7 x 10 ⁻⁷
Iron	<0.1	<0.63	<3.62 x 10 ⁻⁶
Boron	0.137	0.86	4.96 x 10 ⁻⁶
Silica	0.0215	0.135	7.79 x 10 ⁻⁷

Source: (Ex. 19A, Part II, p. 12.)

2. Cumulative Impacts⁹⁴

The proposed project is to be built in an area of southwestern Kern County that has experienced extensive and continuing energy development. (Ex. 19A, Part II, p. 12.) There is the potential for at least three additional power plants (La Paloma, Midway-Sunset, and Sunrise), to be built in the region in the near future. (*Ibid.*) These developments have the potential to impact sensitive species and their habitats. (*Ibid.*) As we noted earlier, habitat loss in southwestern Kern County is an ongoing regional concern of CDFG, BLM, USFWS, and the Energy Commission. (Ex. 19A, Part II, p. 12.) With the exception of the Elk Hills/Buena Vista Valley/Lokern Natural Area complex, most remaining habitat in the area occurs as small and highly fragmented parcels. (*Ibid.*)

The proposed project has been located to minimize habitat loss. (Ex. 19A, Part II, p. 12.) The plant site access road and laydown area will require 17 acres, of which 14 acres are disturbed. (*Ibid.*) The gas pipeline and wastewater pipeline routes follow existing roads. (*Ibid.*) The water supply route will be above ground for 5.7 of 9.8 miles and follow existing roads. (*Ibid.*) The pumping station and injection wells are located in disturbed habitats. (*Ibid.*) The transmission lines will mainly require temporary roads for construction. (*Ibid.*)

In southwestern Kern County, CDFG and the USFWS look for habitat compensation when habitat losses are anticipated for all development projects. (Ex. 19A, Part II, p. 12.) Compensation areas consisting of high quality listed species habitat has been identified and prioritized by their importance towards species recovery needs. (*Ibid.*) On-going efforts by CDFG, USFWS, BLM, Energy Commission, private industry and the Center for Natural Lands Management (CNLM) have established several parcels of protected habitat in the Lokern Natural Area. (*Ibid.*) The goal of each stakeholder is to

⁹⁴ The CEQA Guidelines define cumulative impacts as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. (14 Cal. Code of Regs.,/15355.)

secure and protect as much habitat in this area as possible to keep this large contiguous area of undeveloped land intact. (Ex. 19A, Part II, pp. 12-13.)

Energy Commission biology staff are encouraging applicants for power plant certification in Kern County to direct off-site compensation to lands in the Lokern Natural Area. Collectively, the compensation lands could result in the protection of larger-sized parcels than if compensated independently into several smaller parcels. (Ex. 19A, Part II, p. 13.) The ratio of lands compensated to lands disturbed range from 1:1 to 4:1, depending on the nature of disturbance and current use of disturbed lands. (*Ibid.*) Therefore, the total acres of land set aside for species protection is greater than the total acres of land lost or disturbed by development. (*Ibid.*) To reduce Applicant's potential cumulative impacts, lands needed to offset habitat loss will need to be purchased and protected in perpetuity prior to any surface disturbance. (3/9 RT 19:22:20-4.)

3. Mitigation

Applicant has developed a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) to avoid or reduce impacts to biological resources. (3/9 RT 17:6-18-2; Ex 35.). A final BRMIMP will be provided prior to the start of any construction activities. (3/9 RT 19:22:20-10; Ex. 19, Part II, p. 13.) Applicant's proposed mitigation measures are as follows:

- Avoid sensitive resources to the extent practicable;
- Design transmission lines to reduce risk of avian electrocution;
- Implement a worker environmental awareness-training program;
- Conduct pre-construction surveys;
- Establish buffer/avoidance zones around sensitive resources;
- Excavate kit fox dens and giant kangaroo rat burrows that will not be avoided;
- Identify and mark construction area boundaries;
- Restrict project-related vehicle traffic to established roads, designated temporary access roads, and parking areas;
- Provide a qualified biologist on site to monitor construction activities;
- Confine parking and equipment storage to laydown areas, cap pipes (4-inch or greater diameter) not in use, and visually inspect pipes for wildlife before use;
- Limit construction activities along pipelines and transmission lines to day hours;
- Cover and/or provide escape ramps to open trenches more than 2-feet deep;

- Conserve 4 inches of topsoil in temporary construction areas. Re-contour and spread topsoil over all areas temporarily disturbed by construction activities;
- Comply with mitigation measures specified in legal agreements between USFWS and CDFG;
- Dispose trash in closed containers and prohibit feeding wildlife;
- Prohibit domestic pets on site;
- Notify agencies if a species of concern is injured or killed;
- Submit a post construction compliance report 60-days after completion of the project; and
- Acquire compensation lands or credits for habitat disturbance. (Ex. 19, Part II, p. 13-14.)

To determine habitat compensation, Staff applied the following compensation ratios (provided by USFWS) to determine the amount necessary to compensate for temporary and permanent loss of habitat from project construction:

- 4 acres of habitat for every 1 acre of permanent disturbance to conserved lands.
- 3 acres of habitat for every 1 acre of permanent disturbance to other lands.
- 2.1 acres of habitat for every 1 acre of temporary disturbance to conserved lands.
- 1.1 acres of habitat for every 1 acre of temporary disturbance to other lands. (Ex. 19, Part II, p. 14.)

Applicant provided information to date demonstrates that a total of 98.095-111.98-habitat-acres will have to be set aside prior to construction of the proposed project. (Ex. 19, Part II, p. 14; see **Biological Resources Table 5** below.). In addition to purchasing habitat, Applicant will be required to provide funds necessary for administration and long-term management of the compensatory habitat. (*Id.* at p 15.)

CNLM recent cost estimates for land purchase and management in Kern County are as follows:

- \$1,200 per acre (\$625 for land purchase, + \$170 for administrative costs, + \$405 for an endowment; and
- \$117,714 to \$134,380 total costs for compensation depending on the route chosen. (Ex. 19, Part II, p.14.)

BIOLOGICAL RESOURCES Table 5
Compensation Land (acres) Required From Project

	Permanent Disturbance	Compensation Ratio	Acres Required	Temp. Disturb.	Compensation Ratio	Acres Required	Total Acres Required
Route 1A							
Other	13.19	3:1	39.57	42.23	1.1:1	46.45	
Preserved	3.06	4:1	12.24	1.86	2.1:1	3.906	
Total:			51.81			50.36	102.17
Route 1B							
Other	11.54	3:1	34.62	31.06	1.1:1	34.166	
Preserved	3.08	4:1	12.32	8.09	2.1:1	16.989	
Total:			46.94			51.155	98.095
Route 1B Var							
Other	11.52	3:1	34.56	43.74	1.1:1	48.114	
Preserved	3.08	4:1	12.32	8.09	2.1:1	16.989	
Total:			46.88			65.103	111.983

Source: (Ex. 19, Part II, p. 15.)

Staff recommends that Applicant provide funds to CNLM to be used to purchase the required acres of compensation habitat in the immediate vicinity of the CNLM Lokern Preserve (within the Lokern Natural Area of western Kern County). (Ex. 19, Part II, p. 15.)⁹⁵

The blunt-nosed leopard lizard is a fully protected species (Fish and Game Code section 5050), and the Fish and Game Code prohibits take of any species with this classification. (Ex. 19, Part II, p. 15.) Accordingly, Applicant must employ all feasible means to avoid take during project construction and operation. (*Ibid.*) Avoidance measures (e.g., use of fiber optics to locate active burrows and barrier fencing to keep leopard lizards out of work areas) will be developed in consultation with the CDFG and USFWS and incorporated into the BRMIMP. (*Ibid.*)

The burrowing owl is protected by the Migratory Bird Treaty Act (Fish and Game Code 3513) since it migrates each year from areas that have cold winter temperatures. (Ex.

⁹⁵ CNLM Lokern Preserve is located within the Lokern Natural Area just north of Elk Hills. (Ex. 19A, Part II, p. 15.) It contains the same types of habitat and sensitive species that will be impacted from construction of the proposed project. (*Ibid.*) The Lokern Preserve was originally established by The Nature Conservancy in the late 1980s; it is now owned and managed by CNLM, a private, non-profit organization dedicated to the protection and management of natural resources. (*Ibid.*)

19A, Part II, p. 15.) Burrowing owls found in the project area of southwestern Kern County and other areas of California's Central Valley are mostly residents, but winter migrants may also be present during the winter. (*Ibid.*) To avoid impacting the burrowing owl, Applicant must implement avoidance measures during project construction and operation. (*Ibid.*) Implementation measures for final burrowing owl avoidance protocols will be developed in consultation with CDFG and USFWS and incorporated into the BRMIMP. (*Ibid.*)

FINDINGS AND CONCLUSIONS

Based upon the uncontroverted evidence of record, we find and conclude as follows:

1. Sensitive plants and animals exist in the project area.
2. Construction and operation of the Elk Hills Power Project, if not adequately mitigated, can create adverse impacts to the sensitive biological resources in the project area.
3. The mitigation measures contained in the Conditions of Certification set forth below were developed in cooperation and consultation with the United States Fish & Wildlife Service and with the California Department of Fish and Game.
4. The mitigation measures mentioned above are sufficient to allow the United States Fish & Wildlife Service to issue a formal "Biological Opinion" for the Elk Hills Power Project.
5. The Conditions of Certification assure that the Elk Hills Power Project will cause no significant unmitigated adverse impacts to biological resources in the project area.
6. The Conditions of Certification, if properly implemented, ensure that the Elk Hills Power Project will comply with applicable LORS, which are set forth in the pertinent portion of Appendix A of this Decision.

We therefore conclude that construction and operation of the Elk Hills Power Project will not create any significant direct, indirect, or cumulative adverse impacts to biological resources.

CONDITIONS OF CERTIFICATION

DESIGNATED BIOLOGIST

BIO-1 Construction site and/or ancillary facilities preparation (described as any ground disturbing activity other than Energy Commission approved geotechnical work) shall not begin until an Energy Commission Compliance Project Manager (CPM) approved Designated Biologist is available to be on site.

Protocol: The Designated Biologist must meet the following minimum qualifications:

1. A Bachelor s Degree in biological sciences, zoology, botany, ecology, or a closely related field and three years of experience in field biology;
2. One year of field experience with biological resources found in or near the project area; and
3. An ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for the biological resources tasks that must be addressed during project construction and operation.

If the CPM determines the proposed Designated Biologist to be unacceptable, the project owner shall submit another individual s name and qualifications for consideration. If the approved Designated Biologist needs to be replaced, the project owner shall obtain approval of a new Designated Biologist by submitting to the CPM the name, qualifications, address, and telephone number of the proposed replacement. No disturbance will be allowed in any designated sensitive areas until the CPM approves a new Designated Biologist and the new biologist is on site.

Verification: At least sixty (60) days prior to the start of any ground disturbance activities, the project owner shall submit to the CPM for approval, the name, qualifications, address and telephone number of the individual selected by the project owner as the Designated Biologist. If a Designated Biologist is replaced, the information on the proposed replacement, as specified in the condition, must be submitted in writing at least ten working days prior to the termination or release of the preceding Designated Biologist.

BIO-2 The CPM approved Designated Biologist shall perform the following during project construction and operation:

1. Advise the project owner s Construction Manager on the implementation of the Biological Resource Conditions of Certification;
2. Supervise or conduct mitigation, monitoring and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as, wetlands and special status species; and
3. Notify the project owner and the CPM of any non-compliance with any Biological Resources Condition of Certification.

Verification: During project construction, the Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted along with the Monthly Compliance Reports to the CPM. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

BIO-3 The project owner's Construction Manager shall act on the advice of the Designated Biologist to ensure conformance with the Biological Resources Conditions of Certification.

Protocol: The project owner's Construction Manager shall halt, if necessary, all construction activities in areas specifically identified by the Designated Biologist as sensitive to assure that potential significant biological resource impacts are avoided.

The Designated Biologist shall:

1. Inform the project owner and the Construction Manager when to resume construction; and
2. Advise the CPM if any corrective actions are needed or have been instituted.

Verification: Within two (2) working days of a Designated Biologist notification of non-compliance with a Biological Resources condition of certification or a halt of construction, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem or the non-compliance with a condition. For any necessary corrective action taken by the project owner, a determination of success or failure will be made by the CPM within five (5) 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.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION & MONITORING PLAN

BIO-4 The project owner shall submit to the CPM for review and approval a copy of the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and, once approved, shall implement the measures identified in the plan.

Protocol: The final BRMIMP shall identify:

1. All Biological Resource Conditions included in the Commission's Final Decision;
2. All mitigation measures identified by EHP in Section 5.34 of the Application for Certification (EHPP 1999a).

3. A list and a map of locations of all sensitive biological resources to be impacted, avoided, or mitigated by project construction and operation;
4. A list of all terms and conditions of the USFWS Biological Opinion and the CDFG Incidental Take Permit;
5. A detailed description of measures, Best Management Practices, and take avoidance measures that will be implemented to avoid and/or minimize impacts to sensitive species and reduce habitat disturbance;
6. All locations, on a map of suitable scale, of laydown areas and areas requiring temporary protection and avoidance during construction;
7. Aerial photographs (scale 1:200) of all areas to be disturbed during project construction activities - one set prior to site disturbance and one set after project construction. Include planned timing of aerial photography and a description of why times were chosen;
8. Duration for each type of monitoring and a description of monitoring methodologies and frequency;
9. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
10. All performance standards and remedial measures to be implemented if performance standards are not met;
11. A discussion of biological resource-related facility closure measures; and
12. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval.

Verification: At least forty-five (45) days prior to start of any project-related ground disturbance activities, the project owner shall provide the CPM with the final version of the BRMIMP for this project, and the CPM will determine the plans acceptability. The project owner shall notify the CPM five (5) working days before implementing any CPM approved modifications to the BRMIMP.

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

WORKER ENVIRONMENTAL AWARENESS PROGRAM

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

Protocol: The Worker Environmental Awareness Program must:

1. Be developed by the Designated Biologist and consist of an on-site or training center presentation in which supporting written material is made available to all participants;
2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
3. Present the reasons for protecting these resources;
4. Present the meaning of various temporary and permanent habitat protection measures; and
5. Identify whom to contact if there are further comments and questions about the material discussed in the program.

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

Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program materials. The person administering the program shall also sign each statement.

Verification: At least sixty (60) days prior to the start of rough grading, the project owner shall provide copies of the Worker Environmental Awareness Program and all supporting written materials prepared by the Designated Biologist and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a keep record all persons who have completed the training to date. The signed statements for the construction phase shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six (6) months after the start of commercial operation. During project operation, signed statements for active project operational personnel shall be kept on file for the duration of their employment and for six months after their termination.

CALIFORNIA DEPARTMENT OF FISH & GAME PERMITS

BIO-6 Prior to start of any ground disturbance activities, the project owner shall acquire an Incidental Take Permit from CDFG in accordance with Section 2081(b) of the California Fish and Game Code and implement the permit terms and conditions.

Verification: No less than fifteen (15) days prior to the start of any project related ground disturbance activities, the project owner shall submit to the CPM a copy of the final CDFG Incidental Take Permit. Permit terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan.

BIO-7 Prior to start of any streambed disturbance activities, the project owner shall acquire a Streambed Alteration Agreement from CDFG in accordance with

Section 1603 of the California Fish and Game Code and implement the permit terms and conditions.

Verification: No less than fifteen (15) days prior to the start of any project related ground disturbance activities, the project owner shall submit to the CPM a copy of the final CDFG Streambed Alteration Agreement. Agreement terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan.

U. S. FISH & WILDLIFE SERVICE SECTION 7 BIOLOGICAL OPINION

BIO-8 Prior to the start of any ground disturbance activities, the project owner shall provide a final copy of the U.S. Fish and Wildlife Service Biological Opinion in accordance with Section 7 of the federal Endangered Species Act and incorporate the terms of the biological opinion into the Biological Resources Mitigation Implementation and Monitoring Plan. The project owner will implement the terms and conditions contained in the Biological Opinion.

Verification: At least thirty (30) days prior to the start of any project related ground disturbance activities, the project owner shall submit to the CPM a copy of the USFWS Biological Opinion. Permit terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan.

HABITAT COMPENSATION

BIO-9 To compensate for impacts to sensitive species habitat, the project owner shall provide a non-refundable check for \$163,000 to the Center for Natural Lands Management to purchase, administer, and manage in perpetuity compensatory lands near the project vicinity.

Protocol: Final determination of compensatory acres required will be determined by the Energy Commission after Elk Hills has determined the transmission line route. If any habitat disturbance occurs beyond the 136.5 acres estimated, the project owner shall provide additional funds to the Center for Natural Lands Management at a market price which is anticipated to be approximately \$1,200 per acre. Additional disturbance shall be determined by aerial photos taken before and after construction at a scale of 1 = 200.

Verification: Within one (1) week of project certification, the project owner must provide written verification from CNLM to the CPM that the required compensation funds have been received by the Center for Natural Lands Management.

Within one hundred eighty (180) days after completion of project construction, the project owner shall provide the CPM aerial photographs taken after construction and an analysis of the amount of any additional habitat disturbance beyond that identified in the Final Staff Assessment. The CPM will notify the project owner if any additional funds are required to compensate for any additional habitat disturbances at the adjusted market value at the time to acquire and manage habitat.

FACILITY CLOSURE

BIO-10 The project owner will incorporate into the planned permanent or unexpected permanent closure plan measures that address the local biological resources. The biological resource facility closure measures will also be incorporated into the EHPP project BRMIMP.

Protocol: The planned permanent or unexpected permanent closure plan will require the following biological resource-related mitigation measures:

1. Removal of transmission conductors and above ground pipelines when they are no longer used and useful; and
2. Measures to restore wildlife habitat to promote the re-establishment of native plant and wildlife species.
3. Any special measures that will be implemented in the Elk Hills Conservation Area.

Verification: At least twelve (12) months (or a mutually agreed upon time) prior to the commencement of closure activities, the project owner shall address all biological resource-related issues associated with facility closure in a Biological Resources Element. The Biological Resources Element will be incorporated into the Facility Closure Plan, and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

B. CULTURAL RESOURCES

This section discusses cultural resources, defined as including the structural and cultural evidence of the history of human development and life on earth. These resources assist in the understanding of our culture, our history, and our heritage. Information that can be used to determine the sequence of past human occupation and use of an area is provided by the:

- spatial relationships between an undisturbed resource site and the surface environmental resources and features, and
- an analysis of the locational context of the resource materials within the site and beneath the surface.

The term cultural resources refers generally to those resources, which are typically placed in one of three categories: (1) prehistoric archaeological resources; (2) historic archaeological resources; and (3) ethnographic resources. (Ex. 19, p. 211-212.)

The first category refers to those resources relating to the prehistoric human occupation and use of an area; they typically include sites, deposits, structures, artifacts, rock art, trails, and other traces of prehistoric human behavior. (Ex. 19, p. 211.) Historic archaeological resources are those materials usually associated with non-Native-American exploration and settlement of an area, and correlates with the beginning of a written historical record. (Ex. 19, p. 212.) Such resources include deposits, sites, structures, traveled ways, artifacts, documents, or other indicia of human activity. Ethnographic resources are those materials important to the heritage of a particular ethnic or cultural group such as Native Americans, or African, European, or Asian immigrants. These materials include:

- traditional collecting areas,
- ceremonial sites,
- topographic features,
- cemeteries,
- shrines, or
- ethnic neighborhoods and structures. (*Ibid.*)

SUMMARY AND DISCUSSION OF THE EVIDENCE

The Elk Hills Power Project is proposed for a site located in the Elk Hills Oil and Gas Field at the southwestern edge of the San Joaquin Valley. (Ex. 19, p. 216.) Native Americans may have occupied the project site approximately 8,000-11,500 years ago. (Exs. 19, p. 218-21; 1, pp. 5.16-7-11; 20, Attachment A, p. 2.)⁹⁶ Later the area was inhabited by European explorers, missionaries, and holders of Mexican land grants. More recent occupation has been by those associated with oilfield development and agriculture. (*Ibid.*)

Staff reviewed a land disturbance analysis (LDA) of the Elk Hills site and its related surface facilities, which was performed by Walsh Environmental Scientists and Engineers. (Ex. 19, p. 244.)⁹⁷ The archaeological consultant assessed the degree of prior impacts at 56 prehistoric sites, and while available data from the draft Cultural Resources Management Plan (CRMP) were variable, Staff compiled results as shown on the Table below:⁹⁸

⁹⁶ See the Cultural Resources testimony of Dr. Douglas Davy. According to Dr. Davy, written historical sources trace back 200 years, as opposed to unwritten prehistory.

⁹⁷ Staff stated that the LDA does not mean that the cultural potential of areas regarded as disturbed should be automatically ruled out. (Ex. 19, p. 244.)

⁹⁸ The CRMP was prepared as a Department of Energy (DOE) document, and approved by the State Historic Preservation Office (SHPO) in the DOE Programmatic Agreement (PA) with OEHI. (Ex. 19, pp. 222; 227.) OEHI obtained the then Naval Petroleum Reserve No. 1 (NPR-1) from DOE operational control on February 1, 1998, when it was renamed the Elk Hills Oil and Gas Field. (Ex. 19, p. 221.) The PA with OEHI allowed DOE to complete its eligibility evaluation on all cultural sites prior to the sale, as required under law. (Ex. 19, p. 227.)

Sites with 0 to 20% disturbance	18
Sites with 20-40% disturbance	5
Sites with 40-60% disturbance	5
Sites with 60-80% disturbance	10
Sites with 80 to 100% disturbance, or not relocated	18
<hr/> Total	<hr/> 56

Source: (Ex. 19, p. 244.)

The CRMP did not offer a research design for the evaluation of cultural resources at the Elk Hills Oil and Gas Field. (Ex. 19, p. 222.) Section 2 of the CRMP lists three historic era properties (3 Hay wells) that are eligible for listing in the National Register of Historic Places (NRHP).⁹⁹ (*Ibid.*) Section 2.1 identifies further research to be done, and Section 2.2 refers to an historical publication to be prepared for public distribution. (*Ibid.*) The maps provided as Appendix 2 to the CRMP depict the prehistoric sites exclusively. (*Ibid.*)

After the AFC was filed, Applicant continued to study and evaluate alternative routes for the electrical transmission facilities. A variation to Route 1B was surveyed in August 1999, providing additional information about the archaeological and paleontological environment. (Ex. 19, p. 241.)

⁹⁹ The HRHP requires federal agencies to take into account the effects of their undertakings on historic properties through consultations beginning at the early stages of project planning. (Ex. 19, p. 213.) Although based upon the federal model, California's Register of Historic Resources (CRHR) affords broader protection to cultural resources, such as sites. (*Id.*, at pp.213, 230.)

Staff found that the State Historic Preservation Officer (SHPO) has determined that the following sites are eligible for the National Register of Historic Places (NRHP):

Site	Content	APE?	Distance to Project Facility	Route	Other
CA-KER-3079/H	Prehistoric and Historical	Yes	APE	Distance to Project Facility	Human remains predicted
CA-KER-3080	Human Remains	No	0.25 mi.	1A	
CA-KER-5392	Prehistoric	Yes	0.25 mi	1A	Possible access road
CA-KER-5404	Prehistoric	No		1A	
CA-KER-3168/H	Prehistoric and Historical	No	0.25 mi	1B	0.25

Source: (Ex. 19, p. 241.)

Also determined NRHP-eligible, but apparently not within the Areas of Potential Effect (APE), are CA-KER-3982, CA-KER-3085/H (historic; human remains), and CA-KER-5373/H (historic). Yet to be evaluated are NPR-1 and EHPP-1 which is on Route 2.¹⁰⁰ The presence, integrity, and research potential of subsurface deposits remain largely unknown.

In addition, prior to preparation of the AFC, Applicant's consultants conducted a literature search and reviewed site records and maps at the Southern San Joaquin Valley Information Center of the California Historical Resources Information System (CHRIS) in December 1998. (Ex. 19, p. 222.) Records indicated numerous previous surveys had been done in the project area, but not all of the area potentially effected by the project had been surveyed. (*Ibid.*)

Much of the archival and survey work had been conducted in 1997 and 1998 by the Department of Energy (DOE) as part of the divestiture process for Naval Petroleum Reserve No. 1 (NPR-1), but some of the surveys and records of sites

¹⁰⁰ Route 2 is the raw water supply line running approximately east-west with an APE 100 feet wide and is approximately 9.8 miles long. (Ex. 19, p. 217.) The pipeline crosses a half-section of U.S. Bureau of Land Management property, making the NHPA applicable to the parcel (Ex. 19, p. 226.)

within the APE were as old as 1979. (Ex. 19, p. 222.)¹⁰¹ Applicant's consultant also reviewed lists of historic properties included within the NRHP, CRHR, California Points of Historic Interest, California Landmark files, and historical maps. (*Ibid.*)

Within 0.25 mile of the Elk Hills facilities as then proposed, there were a total of 71 recorded archaeological sites (26 prehistoric, 43 historical, and 2 containing both components) and 5 prehistoric isolated occurrences. (Ex. 19, p. 222-23.)

At that time:

- one site within the APE for transmission Route 1A (CA-KER-3079/H, a multi-component site) had already been nominated to the National Register of Historic Places (NRHP) by the DOE; and
- three others within the buffer zones listed in the OEHI-DOE License Agreement were found eligible. These are CA-KER--5404 and-3080 within 0.25 mile of Route 1A and CA-KER-3168 within the same buffer zone of transmission Route 1B.¹⁰² (*Ibid.*)

In the AFC, within the APE as defined above, the Applicant identified 19 sites and five isolates, after surveying 706 acres. (Ex. 19, p. 224, 228.) As described in the AFC, known historic era cultural resources of potential interest or concern would include:

- transportation corridors and facilities;
- oil and gas production locations and installations;
- homesteads; commercial and residential communities, as represented by buildings, other structural elements and discards;

¹⁰¹ For project construction and operation, the literature and record search focused on the APE, which is defined as an area 0.25 mile around the power plant site, 100 feet to either side of the transmission lines, 50 feet on either side of the water supply and water disposal lines and 50 feet on either side of the natural gas line. (Ex. 19, p. 222.)

¹⁰² Results of the literature review and a brief description of the known resources are summarized in the AFC, Appendix L-2, titled Cultural Resources Inventory of the Elk Hills Power Project (Ex. 19, p. 223.). Site-specific information was filed with the Energy Commission separately to maintain confidentiality of sensitive resource locations. (*Ibid.*) For a summary of the results of the literature review and a brief description of the types of resources found at the recorded sites, refer to the AFC, Tables 2 and 3. (*Ibid.*)

- work camps;
- sites;
- districts;
- landscapes; and
- objects. (Ex. 19, p. 228.)

As presently proposed, the Elk Hills Power Plant consists of several elements:

- The power plant site would be located on the 12 acres adjacent to Elk Hills Road, northeast of its intersection with Skyline Road. Included with the plant site are Route 4, the gas supply line, and a 0.25-mile buffer.
- The Area of Potential Effect (APE) for transmission line Route 1A, the west-east transmission line to Tupman, was defined as 200 feet wide and 9 miles long. Minor adjustments have been made to the original alignment.
- The APE for transmission line Route 1B (south-north transmission line to Buttonwillow) is 200 feet wide and approximately 8.6 miles long. Minor adjustments have been made to this corridor.
- Transmission line variation Route 1B parallels, approximately, the west side of Route 1B from the plant site to the California Aqueduct.
- Alternative Route 1C was a transmission line along Elk Hills Road, generally parallel to 1B, subsequently abandoned. The APE was 200 feet wide and approximately 5.5 miles long.
- Route 2 is the raw water supply line running approximately east-west with an APE 100 feet wide and is approximately 9.8 miles long.
- Route 3 is the wastewater disposal line originating at the power plant with a south north APE approximately 4.4 miles long and 100 feet wide, terminating in new disposal wells.
- Route 4 is a new, west-east 10-inch natural gas supply pipeline elevated above ground for 2,500 feet that originates from the OEHI processing facilities. (Ex. 19, p. 217.)

Other possible project features include:

- new facilities at the Midway substation;
- facilities that may need relocation;
- new spur roads needed for access during construction; and
- potential interconnections of the La Paloma Generating Project (La Paloma) and Sunrise Cogeneration and Power Project (Sunrise) projects with Elk Hills; the residence on PG&E property between the substation fenced areas and Highway 58. (Ex. 19, p. 217.)

As with potential prehistoric resources, buried historical archaeological sites may be concealed from surface observations by:

- superficial grading or land clearing,
- pavement,
- subsequent re-use of the landform,
- agricultural activity,
- sedimentation, or
- other process. (Ex. 19, p. 222.)

Many of the same research issues posed for the prehistoric sites would apply: archaeological context, settlement pattern, past lifeways, technology, adaptation to the environment, and all the subsets such as subsistence, chronology, social organization, economy, and the like. (Ex. 19, p. 222.) Project development and construction activities associated with the project present the potential for adverse impacts to cultural resources because of the additional surface and subsurface ground disturbance involved. (Ex. 19, p. 231.)

CONTENTIONS BY THE PARTIES

1. Applicant and Staff

Applicant and Staff contend that the project will be designed with the intent to avoid cultural resources. (Ex. 19, p. 242.) If avoidance of any potentially significant cultural resource through project design will not be possible, the significance of that resource must be formally evaluated with respect to the NRHP criteria and eligibility to the CRHR. (*Ibid.*) This usually implies subsurface

testing, confirmation of boundaries, analysis of the constituents and integrity, and assessment of scientific research potential in support of the conclusion. (*Ibid.*)

Consultation with Energy Commission staff will be carried out to ensure that all appropriate and necessary measures are taken to minimize impacts to cultural resources encountered during construction. (Ex. 19, p. 335.) Staff concurs with the mitigation measures proposed in the AFC for the power plant site and related facilities. (Ex. 19, p. 243.) Moreover, Staff has suggested additional language to clarify the measures presented by the Applicant and other agencies. The changes would extend the mitigation contingency planning to address the following aspects in greater detail, to include:

- review and approval of the qualifications of professional archaeologists proposed for project monitoring and mitigation efforts;
- require the presence of a qualified Native American monitor and a specialist in historic or industrial archaeology;
- recovery of any sensitive cultural resources prior to impact by project activities;
- recordation and analysis of all pertinent data and scientific information from the site(s) and any recovered cultural resources;
- curation in a qualified repository, of the data and materials recovered;
- preparation of recovered materials to the point of identification and completion of an inventory of materials prepared for curation;
- preparation of a final report on data recovery efforts associated with project mitigation; and
- filing of pertinent maps, photos, and other information with the curated materials. (Ex. 19, p. 243.)

We have included these measures, which are incorporated into the Conditions of Certification specified below.

Applicant's witness stated in his prefiled testimony that he had reviewed the Conditions of Certification proposed by Staff and was in agreement with them. (1/20 RT 91:11-94:24; Ex. 20, App. A., p. 7) Applicant also proposed its own mitigation measures, which were refined and adopted by Staff. (1/20 RT 87:6-23.) Applicant's witness, Dr. Davy, testified that the Applicant followed standard professional archeological practice in surveying the relevant literature and the site. (1/20 RT 90:8-91:10.) He described Applicant's work as intensive, and stated there would be no significant cumulative impacts to cultural resources because we proposed measures to avoid all cultural resources. (*Ibid.*)

2. CURE

CURE's witness, Delia Dominguez, is a Native American who traced her lineage to the area surrounding the project in southwestern Kern County. (1/20 RT 137:18-139-25.) Ms. Dominguez testified that although her family descends from the area, the Elk Hills area is now inaccessible to her. (1/20 RT 140:1-143:12.) She fears that the project area is in real danger of losing its cultural significance to Native Americans. (*Ibid.*) Nevertheless, Ms. Dominguez stated that in general she was unopposed to the plant. (*Ibid.*)

Ms. Dominguez believes there are unidentified historic sites in the project area that may meet the significance standard. (1/20 RT 143:16-147:16.) She testified that it is important to have measures in place that would identify sites before construction begins so that irreparable damage to the sites, and particularly burial grounds, may be avoided. (*Ibid.*) Nevertheless, Ms. Dominguez testified that she was generally satisfied with the Conditions of Certification. (1/20 RT 149:23-151-10.) She stated that her concerns were being addressed in the Conditions, and she wanted to assure that there was such a level of specificity. As to the actual language contained in the Conditions, Ms. Dominguez could not provide any recommended changes. (*Ibid.*) Finally, Ms. Dominguez presented, in closed session, confidential maps which contained a roughly plotted grid of sites having historical significance in the Elk Hills area. (1/20 RT 151:22-156:17.)

COMMISSION DISCUSSION

The evidence establishes that the preferred mitigation for impacts to cultural resources is avoidance of the resource. Moreover, Applicant has proposed additional mitigation methods and Commission staff has developed and refined Conditions of Certification which, include:

- preconstruction structural location avoidance measures,
- construction monitoring,
- coordination with Native Americans,
- significance evaluation,
- curation and recordation,
- mitigation of unavoidable impacts, and
- training procedures for dealing with unanticipated cultural resources discoveries.

We are persuaded that the evidence establishes that the region's cultural resources including prehistoric, historic, and ethnographic resources will be adequately protected. The Conditions of Certification, which incorporate the measures proposed both by Staff and Applicant will reduce to a level of less than significant the project's potential for adverse impacts on cultural resources.

We accept as legitimate the issues raised by Ms. Dominguez in her testimony. The evidence demonstrates persuasively, however, that Applicant intends to avoid those sites where there exists a known danger to create adverse impacts. Applicant has an extensive body of information on the area to include Ms. Dominguez own maps of areas likely to contain significant cultural resource sites.

Moreover, Ms. Dominguez own testimony suggests that she is satisfied that the Conditions of Certification will protect cultural resource sites. Her primary concerns were how the Conditions of Certification were to be interpreted. We are satisfied that they will be interpreted in the best interests of the profound resources they represent.

In sum, we believe that the Conditions of Certification are the proper mechanism to ensure the protection of the Elk Hills cultural resources. We find them to be carefully tailored and sufficient in detail to accomplish the task.

FINDINGS AND CONCLUSIONS

Based upon the evidence of record, we find and conclude as follows:

1. Cultural resources exist in the general project area.
2. Construction activities associated with the Elk Hills Power Project and its related facilities present the most likely potential for adverse impacts to cultural resources.
3. The evidence establishes the likelihood that significant historical resources exist in areas which may be disturbed by project construction.
4. Construction-related disturbance to historical resources would likely have a significant impact if not mitigated.
5. Adverse impacts may be satisfactorily mitigated by implementation of appropriate mitigation measures.
6. The Conditions of Certification listed below contain measures that will ensure that construction of the Elk Hills Power Project and its related facilities will not create significant direct, indirect, or cumulative adverse impacts to cultural resources.
7. Implementation of the Conditions of Certification below will assure that the Elk Hills Power Project will comply with all applicable LORS pertaining to Cultural Resources set forth in the appropriate portion of Appendix A of this Decision.

We therefore conclude that the Elk Hills Power Project will not create any significant direct, indirect, or cumulative adverse impacts to cultural resources.

CONDITIONS OF CERTIFICATION

- CUL-1** Prior to the start of project-related earth disturbing activities to include:

1. vegetation clearance;
2. ground disturbance and preparation and site excavation activities; or
3. parking or movement of heavy equipment onto or over the project surface.

The project owner shall provide the CEC Compliance Project Manger (CPM) with the name and statement of qualifications for its designated cultural resource specialist who will be responsible for implementation of all cultural resources conditions of certification, and for the team member professionally qualified in historic or industrial archaeology.

Protocol: The statement of qualifications for the designated cultural resource specialist shall include all information needed to demonstrate that the specialist meets at least the minimum qualifications specified by the Department of the Interior, as published by the National Park Service, Heritage Preservation Services.

Alternatively, the archaeologist shall be qualified by the Register of Professional Archaeologists (ROPA). The minimum qualifications include the following:

1. a graduate degree in archaeology and cultural resource management;
2. at least three (3) years of archaeological resource evaluation, management, impact mitigation and field experience in California; and
3. at least one (1) year s experience in each of the following areas:
 - a. leading archaeological resource field surveys;
 - b. leading site and artifact mapping, recording, and recovery operations;
 - c. marshaling and use of equipment necessary for cultural resource recovery and testing;
 - d. preparing recovered materials for analysis and identification;
 - e. determining the need for appropriate sampling and/or testing in the field and in the laboratory;
 - f. directing the analyses of mapped and recovered artifacts;
 - g. completing the identification and inventory of recovered cultural resource materials; and

- h. preparing appropriate reports to be filed with the receiving curation repository, the SHPO, and all appropriate regional archaeological information center(s).

Protocol: The statement of qualifications for the designated cultural resource specialist and the historic or industrial archaeologist shall include:

1. a list of specific projects the specialist has previously worked on;
2. the role and responsibilities of the specialist for each project listed; and
3. the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

Verification: At least one hundred and twenty (120) days prior to the start of project earth disturbing activities, the project owner shall submit the name and statement of qualifications of its designated cultural resource specialist and the historic or industrial archaeologist (including items 1, 2, & 3 above) to the CPM for review and written approval.

Thirty (30) days prior to the start of any ground-disturbing action, the project owner shall confirm in writing to the CPM that the approved designated cultural resource specialist and the historic or industrial archaeologist will be available at the start of earth disturbing activities and is prepared to implement the cultural resources Conditions of Certification.

At least ten (10) days prior to the termination or release of a designated cultural resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated cultural resource specialist.

CUL-2 Prior to the start of any earth disturbing or earth moving activities, the project owner shall provide the designated cultural resource specialist and the CPM with:

1. maps and drawings showing the final project design and site layout,
2. the final alignment of all linear facilities, and
3. the location of all auxiliary work areas.

The routes for the linear facilities shall be provided on 7.5 minute US Geological Survey (USGS) quadrangle maps. In addition, maps at a scale of 1 inch to 2000 feet should indicate:

1. post mile markers (including tic marks for tenths of a mile);

2. final center lines and right-of-way boundaries; and the location of all the various areas where surface disturbance may be associated with trenching or excavation; and
3. project-related:
 - access roads,
 - storage yards,
 - laydown sites,
 - pull sites,
 - pump or pressure stations,
 - switchyards, and
 - electrical tower or pole footings, and
 - any other project components.

Prior to the start of any earth disturbing or earth moving activities, the project owner shall also provide to the cultural resources specialist and the CPM, a current, full set of all archaeological site records for all prehistoric and historical cultural resources within 0.25 mile of the APE.

The designated cultural resource specialist may request, and the project owner shall provide, enlargements of portions of the maps presented as a sequence of strip maps for the linear facility routes. The strip maps would include post mile and tenth of a mile markers and would show:

1. detailed locations of proposed access roads,
2. storage or laydown sites,
3. tower or pole footings, and
4. any other areas of disturbance associated with the construction and maintenance of project-related linear facilities.

The project owner shall also provide copies of any such enlargements to the CPM at the same time as they are provided to the specialist.

Verification: At least one hundred fifteen (115) days prior to the start of earth disturbing or earth-moving activities on the project, the project owner shall provide the designated cultural resource specialist and the CPM with copies of site records requested above and final drawings and site layouts for all project facilities and maps at appropriate scale(s) for all areas potentially affected by earth disturbing activities or project construction. If the designated cultural resource specialist requests enlargements or strip maps for linear facility routes, the project owner shall also provide a set of these maps to the CPM at the same time that they are provided to the specialist. All changes thereafter should be mapped and provided to the specialists in the weekly meeting referenced in **CUL-7** and to the CPM in the Monthly Compliance Report.

CUL-3 Prior to the start of project related earth-disturbing activities, the designated cultural resources specialist, a qualified historical or industrial archaeologist, and a qualified (as determined by the cultural resource specialist) Native American monitor, shall conduct:

1. a reconnaissance survey,
2. any necessary presence/absence testing,
3. data recovery, and
4. significance evaluation of the final project site and other areas expected to be affected by pre-construction, construction and operation of the proposed project.

Surveys of the linear facilities shall use the centerlines and rights-of-way delineated by the survey stakes placed for final project engineering and design.

During the surveys, potentially sensitive cultural resource areas that must be protected during construction and operation shall be mapped and listed for specific monitoring and/or mitigation measures to be described in the CRMMP to be prepared per Condition **CUL-4**, below.

Verification: At least one hundred ten (110) days prior to the start of project related earth disturbing activities, the designated cultural resources specialist shall conduct a reconnaissance survey of all areas expected to be affected by construction and operation of the proposed project and its associated linear facilities. Within ten (10) days after completion of the survey, the project owner shall submit a letter summarizing the dates, methodology and preliminary findings of the survey to the CPM for review.

CUL-4 Prior to the start of project related earth disturbing activities, the designated cultural resources specialist shall prepare, and the project owner shall submit to the CPM for review and written approval, a Cultural Resources Monitoring and Mitigation Plan (CRMMP), identifying general and specific measures to minimize potential impacts to cultural resources within areas subject to project related earth disturbance.

Protocol: The CRMMP shall include, but not be limited to, the following elements and measures:

1. A proposed research design for both prehistoric and historical archaeology that includes a discussion of questions that may be answered by the mapping, data and artifact recovery conducted during monitoring and mitigation activities, and by the analysis of recovered data and materials. It shall provide details of the

data needed to address the research issues and the methods proposed to obtain such data.

2. A discussion of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the pre-construction, construction, and post-construction analysis phases of the project.
3. Identification of the person(s) expected to perform each of the tasks and description of the mitigation team organizational structure and the inter-relationship of team roles and responsibilities. Specification of the qualifications of any professional team members. The cultural resources team shall include one member professionally qualified in historical or industrial archaeology. This team member shall be available to participate in survey and monitoring and mitigation activities.
4. A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, the areas or post-mile sections where they will be needed, and their role and responsibilities.
5. A discussion of measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during pre-construction, construction and/or operation, and identification of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of earth disturbing activities and how long they will be needed to protect the resources from project-related effects.
6. A discussion of where monitoring of project activities is deemed necessary by the designated cultural resource specialist. The specialist will determine the size or extent of the areas where monitoring is to occur and will establish the percentage of the time that the monitor(s) will be present. Identification of the monitoring requirement(s) will include areas where other specialists, e.g., biologists, may be conducting their own mitigating programs.
7. A discussion of the requirement that all cultural resources encountered will be recorded and mapped (may include photos) and all significant or diagnostic resources will be collected for analysis and eventual curation into a retrievable storage collection in a public repository or museum that meets the standards and requirements for the curation of cultural

resources as set forth at Title 36 of the Federal Code of Regulations, Part 79.

8. A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during earth disturbing activities or construction.
9. Identification of the public institution that has agreed to receive any data and cultural resources recovered during project-related monitoring and mitigation work. Discussion of the requirements, specifications, or funding needed for the materials to be delivered for curation and how they will be met. Also, include the name and phone number of the contact person at the institution.
10. Identification of specific sites within the APE deemed potentially significant, or potentially subject to impact, which may need additional information and recommendations for subsurface testing, boundary definition, assessment by an archaeologist (qualified in prehistory or historical archaeology as appropriate), or concurrence of the existing evaluation by OHP in the light of new information.

Verification: At least ninety (90) days prior to the start of earth-disturbing activities on the project, the project owner shall provide the CRMMP, prepared by the designated cultural resource specialist, to the CPM for review and written approval.

CUL-5 Prior to the start of earth disturbing or earth moving activities, the designated cultural resources specialist shall prepare an employee training program. The project owner shall submit the cultural resources training program to the CPM for review and written approval.

Protocol: The training program shall discuss the potential to encounter cultural resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training program shall also include the set of resource reporting procedures and work curtailment procedures that workers are to follow if previously unknown cultural resources are encountered during project activities. The training program shall be presented by the designated cultural resource specialist or qualified individual(s) approved by the CPM and may be combined with

other training programs prepared for biological and paleontological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least sixty (60) days prior to the start of earth disturbing or earth moving activities on the project, the project owner shall submit to the CPM for review and written approval, the proposed employee training program, the set of reporting procedures, and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during earth disturbing activities or construction. The project owner shall provide the name and resume of the individual(s) performing the training.

CUL-6 Prior to the start of earth disturbing or earth moving activities and throughout the project construction period as needed for all new employees, the project owner shall ensure that the designated cultural resource trainer(s) provide(s) the CPM-approved cultural resources training to all project managers, construction supervisors, and workers.

The project owner shall ensure that the designated trainer provides the workers with the CPM-approved set of procedures for reporting any sensitive resources that may be discovered during project-related ground disturbance and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during earth disturbing activities or construction.

Verification: Within seven (7) days, after the start of earth disturbing or earth moving activities, the project owner shall provide the CPM with documentation that the designated cultural resources trainer(s) has/have provided to all project managers, construction supervisors, and workers hired before the start of earth disturbing activities the CPM-approved cultural resources training and the set of reporting and work curtailment procedures.

In each Monthly Compliance Report after the start of earth disturbing or earth moving activities the project owner shall provide the CPM with documentation that the designated cultural resource trainer(s) has/have provided to all project managers hired in the month to which the report applies the CPM-approved cultural resources training and the set of reporting and work curtailment procedures.

CUL-7 The designated cultural resource specialist or the specialist's delegated monitor(s) shall have the authority to halt or redirect earth disturbing activities or construction if previously unknown cultural resource sites or materials are encountered during project-

related grading, augering, excavation and/or trenching. Cultural resources monitors shall be members of the approved cultural resources team with a background and experience appropriate to the project area being monitored.

If such resources are found and the specialist determines that they are not significant, the specialist will document the observations and assessment and allow construction to resume, the project owner shall notify the CPM of the find as set forth in the Verification.

If such resources are found and, the specialist determines that they are or may be significant, the halting or redirection of earth disturbing activities or construction shall remain in effect until:

1. the designated cultural resources specialist has notified the CPM of the find and the work stoppage;
2. the specialist, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed; and
3. any necessary data recovery and mitigation has been completed within the immediate area of the discovery.

The designated cultural resources specialist, the project owner, and the CPM shall confer within five working days of the notification of the CPM to determine what, if any, data recovery or other mitigation is needed.

If data recovery or other mitigation measures are required, the designated cultural resource specialist and team members shall monitor earth disturbing and construction activities and implement data recovery and mitigation measures, as needed.

All required data recovery and mitigation shall be completed expeditiously unless all parties agree to additional time.

Verification: No later than thirty (30) days prior to the start of earth disturbing or earth moving activities, the project owner shall provide the CPM with a letter confirming that the designated cultural resources specialist and delegated monitor(s) have the authority to halt earth disturbing or construction activities in the vicinity of a cultural resource find. For any cultural resource encountered that the specialist determines is or may be significant, the project owner shall notify the CPM within twenty four (24) hours unless there is an intervening weekend. If there is an intervening weekend, the project owner shall notify the CPM on the Monday following the weekend.

For any cultural resource encountered that the specialist determines is not significant, the project owner shall notify the CPM within seventy two (72) hours after the find and provide written documentation.

CUL-8 Prior to the start of any earth disturbing or earth moving activity including landscaping, and each week throughout the project construction period, the project owner shall provide the designated cultural resource specialist and the CPM with a current schedule of anticipated monthly project activity. The schedule shall include a map indicating the area(s) where ground disturbing or construction activities will occur one month in advance.

The designated cultural resources specialist shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s), either by other specialists conducting mitigation measures or the actual processes of project development.

Verification: The project owner shall provide the designated cultural resource specialist and the CPM with a week-by-week schedule of the upcoming earth disturbing activities, construction, and mitigation activities, including those to be implemented by other specialists, on or off the project APE, one month in advance, as well as maps showing where each activity is scheduled to take place. These advance schedules are to be provided to the CPM with the Monthly Compliance Report. The project owner shall notify the CPM when all ground disturbing activities, including landscaping are completed.

CUL-9 Prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner and the designated cultural resources specialist shall consult with Native American tribal representatives to identify affected tribes or bands and to develop an agreement(s) for qualified (as determined by the cultural resources specialist) Native American monitors to be present throughout the project pre-construction surveys and construction phase of the project.

Verification: At least thirty (30) days prior to start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall

provide the CPM with a copy of all finalized agreements for Native American monitors.

CUL-10 Throughout the pre-construction reconnaissance surveys and the monitoring and mitigation phases of the project, the designated cultural resources specialist or delegated monitor(s) shall keep a daily log describing the area and nature of work, any resource finds and the progress or status of the resource monitoring, mitigation, preparation, identification, and analytical work being conducted for the project. The daily logs shall indicate by tenths of a post mile, where and when monitoring has taken place, where monitoring has been deemed unnecessary, and where cultural resources were found.

The designated specialist shall prepare a weekly summary report on the progress or status of cultural resource-related activities.

The designated resource specialist and delegated monitor(s) may informally discuss the cultural resource monitoring, testing, data recovery, and any new information with Commission technical staff.

Verification: Throughout any earth disturbing activity and the project construction period, the project owner shall include in the Monthly Compliance Reports to the CPM, copies of the weekly summary reports prepared by the designated cultural resource specialist, regarding project related cultural resource monitoring.

CUL-11 The designated cultural resource specialist or designated monitor(s), shall be present at all times the specialist deems appropriate to monitor construction-related grading, excavation, trenching, augering, or other disturbance of existing surface in the vicinity of previously recorded archaeological sites and in areas where cultural resources have been identified.

Protocol: If the designated cultural resource specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner of the changes. The designated cultural resource specialist shall use post-mile markers and boundary stakes placed by the project owner to identify areas where monitoring is being reduced or is no longer deemed necessary.

Verification: During any earth disturbing activities and throughout the project construction period the project owner shall include in the Monthly Compliance Reports to the CPM copies of the weekly summary reports

prepared by the designated cultural resource specialist regarding project-related cultural resource monitoring.

CUL-12 The project owner shall ensure that the designated cultural resource specialist obtains and maintains a current US Bureau of Land Management (BLM) Archaeological Resource Use Permit to gain access to lands managed by the BLM or other federal agencies, to conduct any surveys, monitoring, data and/or artifact recovery activities on these lands. This use permit is to be obtained from the area office of the BLM in Bakersfield, California, no less than 10 days prior to the start of cultural resource activities governed by the permit.

Verification: The project owner shall provide the CPM and the designated BLM representative(s) with a copy of the BLM archaeological resource use permit received by the designated cultural resource specialist, in the next Monthly Compliance Report following its receipt or renewal.

CUL-13 The project owner shall ensure that:

1. the designated cultural resource specialist meets the professional qualifications specified by the BLM;
2. the CRMMP prepared per Energy Commission Condition **CUL-4**, also reflects BLM requirements for an Archaeological Resource Treatment Plan; and
3. all surveys, monitoring, and data and/or artifact recovery activities implemented during the construction and operation of the Elk Hills project comply with these requirements.

Verification: In each Monthly Compliance Report, the project owner shall provide the CPM with a summary outlining the measures it has taken to ensure that it has met both BLM and Commission requirements.

CUL-14 The project owner shall ensure that the designated cultural resource specialist performs the recovery, preparation for analysis, analysis, preparation for curation, and delivery for curation of all cultural resource materials encountered and collected during pre-construction surveys and during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files, copies of signed contracts or agreements with the individuals, companies, or institutions which will ensure the necessary recovery, preparation for analysis, and analysis of cultural resource materials collected during data recovery and mitigation for the project and permanent curation of the resulting data and cultural materials. The project owner shall maintain these

files for the life of the project and the files shall be kept available for periodic audit by the CPM. Information as to the specific location of sensitive cultural resource sites shall be kept confidential and accessible only to qualified cultural resource specialists.

CUL-15 Following completion of data recovery and site mitigation work, the project owner shall ensure that the designated cultural resources specialist prepares a proposed scope of work for the final Cultural Resources Report. The project owner shall submit the proposed scope of work to the CPM for review and written approval.

Protocol: The proposed scope of work shall include (but not be limited to):

1. a discussion of any analysis to be conducted on recovered cultural resource materials;
2. a discussion of possible results and findings;
3. proposed research questions which may be answered or raised by analysis of the data recovered from the project; and
4. an estimate of the time needed to complete the analysis of recovered cultural resource materials and prepare the Cultural Resources Report.

Verification: The project owner shall ensure that the designated cultural resources specialist prepares the proposed scope of work within ninety (90) days following completion of the data recovery and site mitigation work. Within 7 days after completion of the proposed scope of work, the project owner shall submit it to the CPM for review and written approval.

CUL-16 The project owner shall ensure that the designated cultural resources specialist prepares a Cultural Resources Report. The project owner shall submit the report to the CPM for review and written approval.

Protocol: The Cultural Resources Report shall include (but not be limited to) the following:

1. For all projects:
 - (a) description of pre-project literature search, surveys, and any testing activities;
 - (b) maps showing areas surveyed or tested;
 - (c) a description of any monitoring activities;
 - (d) maps of any areas monitored; and
 - (e) conclusions and recommendations.

2. For projects in which cultural resources were encountered, include the items specified under 1 and also provide:
 - (a) site and isolate records and maps;
 - (b) a description of testing for, and determinations of, significance and potential eligibility; and
 - (c) a discussion of the research questions answered or raised by the data from the project.

3. For projects regarding which cultural resources were recovered, include the items specified under 1 and 2 and also provide:
 - (a) a description of the methods employed in the field and laboratory;
 - (b) description (including drawings and/or photos) of recovered cultural materials;
 - (c) results and findings of any special analyses conducted on recovered cultural resource materials;
 - (d) an inventory list of recovered cultural resource materials;
 - (e) interpretation of the site(s) with regard to the research design; and
 - (f) the name and location of the public repository receiving the recovered cultural resources for curation.

Verification: The project owner shall ensure that the designated cultural resources specialists completes the Cultural Resources Report within ninety (90) days following completion of the analysis of the recovered cultural materials. Within 7 days after completion of the report, the project owner shall submit the Cultural Resources Report to the CPM for review and written approval.

CUL-17 The project owner shall submit an original, an original-quality copy, and a computer disc copy of the CPM-approved Cultural Resource Report to the public repository to receive the recovered data and materials for curation (or other format to meet the repository's requirements), with copies to the State Historic Preservation Officer (SHPO) and to the appropriate regional archaeological information center(s). The disc files must meet SHPO requirements for format and content.

Protocol: The copies of the final Cultural Resource Report to be sent to the curating repository, the SHPO, and the regional

information center(s) shall include the following (based on the applicable scenario (1, 2, or 3) set forth in **CUL-16**):

1. originals or original-quality copies of all text;
2. originals of any topographic maps showing site and resource locations;
3. originals or original-quality copies of drawings of significant or diagnostic cultural resource materials found during pre-construction surveys or during project-related monitoring, data recovery, or mitigation; and
4. photographs of the site(s) and the various cultural resource materials recovered during project monitoring and mitigation and subjected to post-recovery analysis and evaluation. The project owner shall provide the curating repository with a set of negatives for all of the photographs.

Verification: Within thirty (30) days after receiving approval of the Cultural Resources Report, the project owner shall provide to the CPM documentation that the report has been sent to the public repository receiving the recovered data and materials for curation, the SHPO, and the appropriate archaeological information center(s).

For the life of the project the project owner shall maintain in its compliance files copies of all documentation related to the filing of the CPM-approved Cultural Resources Report with the public repository receiving the recovered data and materials for curation, the SHPO, and the appropriate archaeological information center(s).

CUL-18 Following the filing of the CPM-approved Cultural Resource Report with the appropriate entities, the project owner shall ensure that all cultural resource materials, maps and data collected during data recovery and mitigation for the project are delivered to a public repository that meets the U.S. Secretary of the Interior standards for the curation of cultural resources. The project owner shall pay any fees for curation required by the repository.

Verification: The project owner shall ensure that all recovered cultural resource materials are delivered for curation within thirty (30) days after providing the CPM-approved Cultural Resource Report to the public repository receiving the recovered data and materials, to the SHPO, and to the appropriate archaeological information center(s).

For the life of the project, the project owner shall maintain in its project history or compliance files, copies of signed contracts or agreements with the public repository to which the project owner has delivered for curation all

cultural resource materials collected during data recovery and mitigation for the project.

CUL-19 Prior to transmission line earth disturbing activities and construction, the project owner shall:

1. Design the transmission line in the areas cited to span the sensitive cultural resource site areas.
2. In the area between MP 5.0 to MP 6.0 and MP 7.5 to MP 9.0 of Route 1A, if it is not possible to span potential cultural resources, at each area of ground disturbance, the cultural resource specialist will survey the area. The survey will determine with appropriate methods whether the site represents a potentially significant cultural resource or has been formally determined not to be eligible.
3. To determine the presence or absence of subsurface deposits, the cultural resources specialist will conduct a detailed surface examination of an area 100 feet in diameter around the pole site. If cultural materials are found to be present, the designated cultural resource specialist will conduct an excavation at the center of the pole site. The preferred means of excavation will include a hand excavation unit 1-meter by 1- meter using archaeological methods and techniques. However, if deemed appropriate by the cultural resource specialist, the excavation may be conducted using auger or backhoe.
4. If sensitive cultural resources are located in situ, the pole site shall be moved to a new location, and that alternate location will be surveyed and tested, if necessary, to insure that there are no sensitive cultural resources present. If it is not possible to move the pole site, the designated cultural resources specialist will design and implement mitigation measures, i.e., data recovery according to the research design.
5. In areas where human remains may be unearthed, a representative of the Native American Community shall be requested to be on site during excavations and earth disturbing activities.

Verification: The project owner shall include information about the activities related to this condition in the weekly summary of the designated

cultural resource specialist s daily log submitted to the CPM in the Monthly Compliance Report.

C. GEOLOGY AND PALEONTOLOGY

This section addresses the project's potential impacts on geological hazards, geological and paleontological resources, and surface water hydrology. Paleontological resources include the fossilized remains or trace evidence of prehistoric plants or animals, which are preserved in soil or rock. These fossils are scientifically important because they help document the evolution of particular groups of organisms and the environment in which they lived.

The purpose of the geological and paleontological analysis is to verify that:

- applicable laws, ordinances, regulations, and standards (LORS) have been identified, and
- the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The proposed project is located in the Elk Hills Oil and Gas Field, in western Kern County. Geology at the site is made up of silt, sand and gravel outcroppings of the Tulare Formation, alluvium and minor amounts of fill. (Ex. 19, p. 278.) The soil overlying most of the power plant footprint area has been disturbed. (*Ibid.*) The site slope gradient is very shallow, so the potential for slope stability problems is remote. (*Ibid.*) Groundwater at the site is in excess of 1000 feet below existing grade. (*Ibid.*)

The project is located within seismic zone 4.¹⁰³ (Ex. 19, p. 278.) No active faults are known to cross the proposed power plant footprint or the linear facilities.¹⁰⁴ (*Ibid.*) Several inactive faults cross electric transmission line route 1A and water supply pipeline Route 2. The San Andreas Fault Zone is located approximately 12 miles west

¹⁰³ As delineated on Figure 16-2 of the 1998 edition of the California Building Code.

¹⁰⁴ On November 16, 1999, CURE submitted a report based upon an evaluation of aerial photographs that raised concerns about certain ground lineations near the injection wells that could be interpreted as fault lines. (Ex. 19B, Part II, p. 1.) Consequently, the parties conducted a site visit and inspection, which revealed that the lineations appeared to be the expression of bedding planes and excavations for pipelines for existing oil field operations, rather than fault lines.

the proposed site. (*Ibid.*) The potential for surface ground rupture at the power plant location is negligible since there are no known faults at the site. (*Ibid.*)

Applicant's evidence revealed that the project site poses a low risk of liquefaction, which is a condition where soil may lose its strength due to a sudden increase in water pressure. (Ex. 19, p. 279.) Liquefaction, if it occurs at all, usually is observed in the upper 100 feet beneath a site. (*Ibid.*) The depth to groundwater at the proposed power plant location is in excess of 1,000 feet, and the depth along the proposed linear facilities is reported to be in excess of 200 feet. (*Ibid.*) Since the depth to ground water at the proposed power plant and the linear facilities is greater than 100 feet, the potential for liquefaction is negligible. (*Ibid.*)

Hydrocompaction is the process of the loss of soil volume upon the application of water. (Ex. 19, p. 279.) The soils at the project site are partially saturated and dense and are not considered prone to hydrocompaction. (*Ibid.*) In addition, subsidence due to oil extraction has not been reported by Applicant nor observed by Staff during a site visit in March 1999. (*Ibid.*) Soils that contain a high percentage of expansive clay minerals are prone to expansion, if subjected to an increase in water content. (*Ibid.*) The AFC reported near surface soil to be a candidate for testing, which was done within the footprint of the proposed plant site. (*Ibid.*) Several samples were taken, and of those, only one sample--taken between three to five feet below existing grade--had a high Expansive Index. (Ex. 21A.) Staff has recommended that the soils at this location should be further assessed during the final geotechnical investigation.¹⁰⁵

The site is located on one of the largest oil and natural gas reserves in the United States. (Ex. 19, p. 279.) No other geological resources have been identified at the site or along the electric transmission line alignments, the natural gas supply line, or the water supply line. (*Ibid.*) Directional drilling techniques and oil and gas extraction techniques, however, will allow the power plant not to interfere with the recovery of oil and gas resources. (*Ibid.*) The Department of Conservation, Division of Oil and Gas

¹⁰⁵ We have included as a part of Condition **GEO-2** a requirement that the Engineering Geology Report prepared by the engineering geologist contain a statement as to further expansion testing as Staff recommended.

and Geothermal Resources (DOGGR) requires that a setback from existing wells be maintained so that the wells may be serviced. (*Ibid.*) Staff has thus proposed a Condition that should allow the project owner to work out a linear facility development plan that will ensure no hazard is posed to existing oil wells. (See Condition **GEO-3**.)

No paleontological resources are known to exist at the site although the Tulare Formation is known to contain vertebrate and invertebrate fossils. (*Ibid.*) Moreover, the alluvium near the site and linear facilities is not known to contain fossils. (*Ibid.*) Near the cities of Taft and Buttonwillow, the alluvium is known to contain fossils. Therefore, Staff has proposed conditions, which will enable Applicant to mitigate impacts to less than significant upon paleontological sources should they be encountered during construction, operation, and closure of the project. (See Conditions **PAL-1-7**.)

FINDINGS AND CONCLUSIONS

Accordingly, based upon the uncontroverted evidence of record, we find and conclude as follows:

1. Geological and paleontological resources exist in the project area.
2. Construction and ground disturbance activities associated with the construction of the Elk Hills Power Project can potentially impose direct, indirect, and cumulative impacts to paleontological resources.
3. Mitigation measures required by the Conditions of Certification will assure that the activities associated with the Elk Hills Power Project will cause no direct, indirect, or cumulative adverse impacts to paleontological resources.
4. The Elk Hills Power Project will have no significant adverse impact on surface water hydrology.
5. The Elk Hills Power Project will have no significant adverse impact on geological or paleontological resources.
6. Implementation of the Conditions of Certification will ensure that the project is constructed and operated in compliance with applicable laws, ordinances, regulations, and standards identified in the appropriate portion of Appendix A of this Decision.

We therefore conclude that the project will not cause any significant adverse direct, indirect, or cumulative impacts to geological or paleontological resources.

CONDITIONS OF CERTIFICATION

GEO-1 Prior to the start of construction, the project owner shall assign to the project an engineering geologist(s), certified by the State of California, to carry out the duties required by the 1998 edition of the California Building Code (CBC) Appendix Chapter 33, Section 3309.4.

The certified engineering geologist(s) assigned must be approved by the CPM (the functions of the engineering geologist can be performed by the responsible geotechnical engineer, if that person has the appropriate California license).

Verification: At least thirty (30) 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 to the CPM for approval the name(s) and license number(s) of the certified engineering geologist(s) assigned to the project. The submittal should include a statement that CPM approval is needed. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of its findings within fifteen (15) days of receipt of the submittal. If the engineering geologist(s) is subsequently replaced, the project owner shall submit for approval the name(s) and license number(s) of the newly assigned individual(s) to the CPM. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of the findings within fifteen (15) days of receipt of the notice of personnel change.

GEO-2 The assigned engineering geologist(s) shall carry out the duties required by the 1998 CBC, Appendix Chapter 33, Section 3309.4 Engineered Grading Requirement, and Section 3318.1 — Final Reports. Those duties are:

1. Prepare the Engineering Geology Report. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit.
2. Monitor geologic conditions during construction.
3. Prepare the Final Engineering Geology Report.

The Engineering Geology Report (required by the 1998 CBC Appendix Chapter 33, Section 3309.3 Grading Designation), shall include:

- an adequate description of the geology of the site to include a further soil expansion test assessment as recommended by Staff on page 279 of the FSA,
- conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and

- an opinion on the adequacy, for the intended use, of the site as affected by geologic factors.

The Final Engineering Geology Report to be completed after completion of grading, as required by the 1998 CBC Appendix Chapter 33, Section 3318.1, shall contain the following material or certifications from the approved geologist(s)

- a final description of the geology of the site and any new information disclosed during grading;
- the effect of any new information on recommendations incorporated in the approved grading plan; and
- a statement that, to the best of his or her knowledge, the work within their area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of this chapter.

Verification: Within fifteen (15) days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that:

1. the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications; and
2. that the recommendations contained in the report are incorporated into the plans and specifications.

Within ninety (90) days following completion of the final grading, the project owner shall submit copies of the Final Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3318 Completion of Work, to the CPM and the CBO.

GEO-3 The project owner shall submit a linear facility (transmission lines and utility lines) development plan (LFDP). The LFDP shall address any actions to be undertaken by the project owner to ensure no hazard or problems will be created with the existing wells in the construction site and laydown areas.

The LFDP shall be submitted to the Division of Oil and Gas and Geothermal Resources (DOGGR) for review and comment. The linear facility development plant shall include a discussion of how a minimum setback from existing oil wells is to be maintained.

Verification: At least sixty (60) days prior to the start of construction, the project owner shall submit to the CPM a copy of DOGGR's letter commenting on the LFDP development plan.

Within fifteen (15) days of receipt of the LFDP and the DOGGR comment letter on the plan, the CPM will either approve or comment and deny the plan, and transmit the approval or denial letter to the project owner.

PAL-1 Prior to the start of any project-related construction activities, the project owner shall ensure that the designated paleontological resource specialist approved by the CPM is available for field activities and prepared to implement the conditions of certification.

Project-related construction activities are defined as any:

- construction-related vegetation clearance,
- ground disturbance and preparation, and
- site excavation activities).

The designated paleontological resources specialist shall be responsible for implementing all the paleontological conditions of certification and for using qualified personnel to assist in this work.

Protocol: The project owner shall provide the CPM with the name and statement of qualifications for the designated paleontological resource specialist.

The statement of qualifications for the designated paleontological resources specialist shall demonstrate that the specialist meets the following minimum qualifications:

- a degree in paleontology or geology or paleontological resource management;
- at least three years of paleontological resource mitigation and field experience in California, including
- at least one year s experience leading paleontological resource mitigation and field activities;
- a listing of specific projects the specialist has previously worked on;
- the role and responsibilities of the specialist for each project listed; and
- the names and phone numbers of contacts familiar with the specialist s work on these referenced projects.

If the CPM determines that the qualifications of the proposed paleontological resource specialist are not in concert with the above requirements, the project owner shall submit another individual s name and qualifications for consideration.

If the approved, designated paleontological resource specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontological resource specialist. At least 10 days prior to the termination or release of the preceding designated paleontological resource specialist, the project owner shall submit the name and qualifications of the proposed replacement to the CPM.

Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

Verification: At least ninety (90) days prior to the start of construction, the project owner shall submit the name and resume and the availability for its designated paleontological resource specialist, to the CPM for review and approval. The CPM shall provide approval or disapproval of the proposed paleontological resource specialist.

At least ten (10) days prior to the termination or release of a designated paleontological resource specialist, the project owner shall obtain CPM approval of the replacement specialist. The project owner shall submit to the CPM the name and resume of the proposed new designated paleontological resource specialist.

Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

PAL-2 Prior to the start of project construction, the designated paleontological resource specialist shall prepare and submit to the CPM for review and approval a Paleontological Resources Monitoring and Mitigation Plan (PRMMP). The PRMMP shall identify general and specific measures to minimize potential impacts to sensitive paleontological resources. After CPM approval, the project owner's designated paleontological resource specialist shall be available to implement the PRMMP, as needed, throughout project construction.

The project owner shall adopt the guidelines of the Society of Vertebrate Paleontologist. In addition, the PRMMP shall include, but not be limited to, the following elements and measures:

- a discussion of the sequence of project-related tasks, such as any pre-construction surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation;
- identification of the person(s) expected to assist with each of the tasks identified within this condition for certification, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities;
- where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur and a schedule for the monitoring;
- An explanation that the designated paleontological resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined;
- a discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;

- inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontological resources; and
- identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work, discussion of any 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.

Verification: At least sixty (60) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the PRMMP prepared by the designated paleontological resource specialist for review and approval. If the plan is not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes.

PAL-3 Prior to the start of construction, throughout the project construction period and as needed for all new employees, the project owner and the designated paleontological resource specialist shall prepare and conduct CPM-approved training to all, project managers, construction supervisors, and workers who operate ground disturbing equipment.

The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontological resources or deposits that may be discovered during project-related ground disturbance.

Protocol The paleontological training program shall discuss the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall also include the set of reporting procedures that workers are to follow if paleontological resources are encountered during project activities. The training program shall be presented by the designated paleontological resource specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least thirty (30) days prior to the start of project construction, the project owner shall submit to the CPM for review, comment, and written approval:

1. the proposed employee training program, and
2. the set of reporting procedures the workers are to follow if paleontological resources are encountered during project construction.

If the employee training program and set of procedures are not approved, the project owner, the designated paleontological resource specialist, and the CPM

shall meet to discuss comments and negotiate necessary changes, before the beginning of construction.

Documentation for training of additional new employees shall be provided in subsequent Monthly Compliance Reports, as appropriate.

PAL-4 The designated paleontological resource specialist shall be present at all times he or she deems appropriate to monitor construction-related grading, excavation, trenching, and/or augering in areas where potentially fossil-bearing sediments have been identified. If the designated paleontological resource specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner.

Verification: The project owner shall include in the Monthly Compliance Reports a summary of paleontological activities conducted by the designated paleontological resource specialist.

PAL-5 The project owner, through the designated paleontological resource specialist, shall ensure recovery; preparation for analysis; analysis; identification and inventory; preparation for curation; and the delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files copies of signed contracts or agreements with the designated paleontological resource specialist and other qualified research specialists who will ensure the necessary:

- data and fossil recovery;
- mapping;
- preparation for analysis;
- analysis;
- identification and inventory; and
- preparation for and delivery of all significant paleontological resource materials collected during data recovery and mitigation for the project.

The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resources Report and shall keep these files available for periodic audit by the CPM.

PAL-6 The project owner shall ensure preparation of a Paleontological Resources Report by the designated paleontological resource specialist. The Paleontological Resources Report shall be completed following completion of the analysis of the recovered fossil materials and related information. The project owner shall submit the paleontological report to the CPM for approval.

Protocol: The report shall include (but not be limited to):

- a description and inventory list of recovered fossil materials;
- a map showing the location of paleontological resources encountered;
- determinations of sensitivity and significance; and
- a statement by the paleontological resource specialist that project impacts to paleontological resources have been mitigated.

Verification: The project owner shall submit a copy of the Paleontological Resources Report to the CPM for review and approval under a cover letter stating that it is a confidential document. The report is to be prepared by the designated paleontological resource specialist within ninety (90) days following completion of the analysis of the recovered fossil materials.

PAL-7 The project owner shall include in the facility closure plan a description regarding facility closure activity s potential to impact paleontological resources. The conditions for closure will be determined when a facility closure plan is submitted to the CPM twelve (12) months prior to closure of the facility. If no activities are proposed that would potentially impact paleontological resources, then no mitigation measures for paleontological resource management are required in the facility closure plan.

Protocol: The closure requirements for paleontological resources are to be based upon the Paleontological Resources Report and the proposed grading activities for facility closure.

Verification: The project owner shall include a description of closure activities described above in the facility closure plan.

D. SOIL AND WATER RESOURCES

This portion of the Decision concentrates on the project's potential to induce erosion and sedimentation, adversely affect surface and groundwater supplies, degrade surface and groundwater quality, and increase the potential for flooding.¹⁰⁶

SUMMARY AND DISCUSSION OF THE EVIDENCE

The proposed plant, laydown area, and ancillary facilities will be located almost entirely within the Elk Hills Oil and Gas Field, with the exception of the proposed electric transmission facilities and a portion of the water supply pipeline. (Exs. 19A, Part II, p. 3; see also Ex. 1, Figure 5.10-1.)¹⁰⁷ The 9.8-mile water supply pipeline will extend from the plant site east to the West Kern Water District (WKWD) facilities near Tupman (Route 2). In addition, a 4.4-mile wastewater disposal pipeline is proposed to extend from the plant heading south generally paralleling Elk Hills Road (Route 3), terminating at new Class 1 injection wells. (Exs. 19A, Part II, pp. 3, 5; 1, Figure 5.10-1.)

Soils

Generally, the Elk Hills are characterized by a series of rounded, smooth sloped hills, extending from the Temblor Range to the west. (Ex. 19A, Part II, p. 3.) Soils found at the powerplant site and laydown area belong entirely to the Kimberlina-Urban Land Complex (50% Kimberlina and 35% Urban Land). (Ex.

¹⁰⁶ Accelerated wind and water induced erosion may result from earth moving activities associated with construction of the Elk Hills Power Project. (Ex. 19A, Part II, p. 7.) Removal of the vegetative cover and alteration of the soil structure leaves soil particles vulnerable to detachment and erosion. (*Ibid.*) In an arid environment such as the western San Joaquin Valley, intense rainfall can greatly enhance the potential for erosion. (*Ibid.*) Grading activities may redirect runoff into vulnerable areas, and construction of linear facilities across drainages can elevate erosion potential. (*Ibid.*)

¹⁰⁷ See also discussion under Project Description.

19A, Part II, p. 3, see **Soil & Water Table 1** below for a description of soil units affected by the project.)¹⁰⁸ Many different soil units were identified for the various linear routes, including Kimberlina Sandy Loam, Torriorthents, Elkhills Sandy Loam, etc. (3/9 RT 73:14-74:12; Ex. 19A, Part II, p. 3.) In general, the soils along the linear routes are characterized as sandy loams with about 5-20 percent clay. (3/9 RT 73:14-19; Ex. 19A, Part II, p. 4.)

The sensitivity of the soils affected by the proposed project, that would be subject to water and wind erosion, varies from low to high. (Ex. 19A, Part II, p. 7.) The soils are moderately susceptible to sheet and rill erosion and have low to moderate wind erosion potential. (*Id.*, pp. 7-8.) Once the protective cover of vegetation is removed and the structure of the surface soil has been altered, however, all of these soils can be highly vulnerable to erosion.¹⁰⁹

Site preparation will include the removal of existing tanks and other equipment, and the site will be cut and filled to provide a level area for the powerplant at an elevation of 1,330 feet above mean sea level. (Ex. 19A, Part II, p. 8.) Only about 3 acres of the powerplant site are vegetated. (*Ibid.*) Approximately 60,000 cubic yards of material will be excavated from portions of the site and compacted in other portions of the site to achieve the finished grade. (*Ibid.*) Material to be used for compaction will be stockpiled; imported soils will be unnecessary. (*Ibid.*)

¹⁰⁸ The Department of Water Resources (DWR) identified the 25-year recurrence, 24-hour duration storm event to be 4.7 inches of rain, and evaporation rates in the project vicinity at more than 62 inches per year. Based on average rainfall data, most of the precipitation in the area occurs November through May. (Ex. 19A, Part II, p. 3.)

¹⁰⁹ **Biological Resources Table 2** shows estimated permanent and temporary disturbances resulting from construction and operation of the Elk Hills project. (See **Biological Resources** section, *infra.*)

SOIL & WATER RESOURCES Table 1
Soil Descriptions and Properties

Soil Name	% Slope	Erosion Hazard		Permeability	Project Elements
		Water	Wind		
Cajon Sandy Loam	2 — 5	Slight	Moderate	Moderately rapid to rapid	Transmission Line
Elkhills Sandy Loam	9 — 60	Moderate to High	Low	Moderately rapid	Transmission Line, Water Supply Pipeline, Wastewater Pipeline, Natural Gas Line
Elkhills Complex	9 — 50	Moderate to High	Low	Moderately rapid	Transmission Line, Wastewater Pipeline
Garces Silt Loam	0 — 2	Slight		Very slow	Transmission Line
Kimberlina Sandy Loam	0 — 9	Slight to Moderate	Low	Moderately rapid	Transmission Line, Water Supply Pipeline, Wastewater Pipeline
Kimberlina-Cajon, occasionally flooded-Riverwash Complex	0 — 5	Moderate	Low	Moderately rapid	Transmission Line, Wastewater Pipeline
Kimberlina-Urban Land Complex	0 — 5	Slight	Low	Moderately rapid	Power Plant Site, Construction Laydown Area, Transmission Line, Wastewater Pipeline, Natural Gas Line
Torriorthents, thick	9 — 50	Moderate to High	Low to Moderate	Moderate	Water Supply Pipeline, Wastewater Pipeline
Torriorthents, thick-Elkhills Complex	9 — 30	Moderate to High	Low	Moderately slow	Transmission Line, Water Supply Pipeline, Wastewater Pipeline
Torriorthents, thick-Torriorthents, thin Complex	15 — 60	Moderate to High	Low	Moderately slow	Transmission Line, Water Supply Pipeline, Wastewater Pipeline
Torriorthents, thick-Torriorthents, very thin, eroded Complex	15 — 30	Moderate	Moderate	Moderately slow	Water Supply Pipeline
Buttonwillow Clay	0 — 2	Moderate	Low	Slow to Moderately rapid	Transmission Line
Torriorthents, thick-Elkhills- Torriorthents, thin, eroded Complex	30 — 60	High	Moderate	Moderately slow	Transmission Line
Torriorthents, thick-Torriorthents, thin-and very thin, eroded Complex	30 — 60	High	Low	Moderately slow	Transmission Line, Water Supply Pipeline
Torriorthents, stratified, eroded-Elkhills complex	9 — 50	High		Moderate to slow	Water Supply Pipeline
Lokern Clay	0 — 2	Moderate	Low	Very low	Transmission Line

Source: Ex. 19A, Part II, p. 7.

Material unsuitable for compaction or contaminated materials will be disposed in compliance with all applicable requirements (Ex. 19A, Part II, p. 8; see **Waste Management** section, *supra*) Some vegetation removal and earth moving activities will likely be needed for the 5-acre laydown area. (*Ibid.*) The entire plant site will be paved, and the graded surface will have a mild slope of 2 percent. (*Ibid.*) Surface runoff will flow northerly from the project site to North Elk Hills Tributary No. 6. (*Ibid.*)

Soil disturbances, both temporary and permanent, will occur as a result of constructing and operating the proposed new linear facilities. (Ex. 19, Part II, p. 8.) Water will be delivered to the powerplant via Route 2, a 16-inch water supply pipeline. (*Ibid.*) Portions of the new supply line will be underground (4.2 miles) with approximately 36 inches of ground cover. (*Ibid.*) The aboveground portion of Route 2 will traverse primarily hilly, naturally vegetated terrain. (*Ibid.*)

Route 3, the new 4.4-mile wastewater pipeline, will be aboveground, traversing hilly, naturally vegetated terrain. (Ex. 19A, Part II, p. 8.) Both Routes 2 and 3 would be constructed following existing pipelines along their entire length. Soil disturbance associated with construction and maintenance of these pipelines is expected to be minimal because existing roads can be used. (*Ibid.*) Route 4, the 0.5 mile natural gas supply line, will be constructed entirely aboveground with a corridor approximately 40 feet wide (or 4.8 acres). The pipeline will travel along an existing pipeline route. (*Ibid.*)

Applicant has proposed three alternate transmission line routes, Routes 1A, 1B, and Route 1B Variation.¹¹⁰ (Ex. 19A, Part II, p. 8.) A temporary, 100-foot wide construction right-of-way will be required along the transmission routes. (*Ibid.*) Transmission line routes are proposed along existing utility corridors and access roads. (*Ibid.*) Some road spurs will be needed to allow access to the routes.

¹¹⁰ Route 1B Variation generally follows the contours of Route 1B. (Ex. 19, p. 14.) For reasons of flexibility, Applicant desires certification of all three transmission line options. (*Ibid.*)

(Ibid.) Construction of Route 1A is expected to result in land disturbance of approximately 40 acres (this includes tensioning and pull sites). Route 1B, and 1B Variation, are expected to impact approximately 29 acres during construction *(Ibid.)*. Each of the bases needed to support the transmission poles will permanently displace 100 square feet of soil (54 supports for Route 1A and 51 for Route 1B.) *(Ibid.)*

During project operation, wind and water action can continue to erode unprotected surfaces. (Ex. 19A, Part II, p. 9.) An increase in the amount of impervious surfaces can increase runoff, leading to the erosion of unprotected surfaces. *(Ibid.)* Applicant, therefore, has provided a draft Erosion Control and Stormwater Management Plan that identifies potential temporary and permanent erosion and stormwater runoff control measures. *(Ibid.)* This plan will serve as a precursor to Applicant's Storm Water Pollution Prevention Plan (SWPPP). (Ex. 19A, Part II, pp. 18-20; see Condition **Soils & Water-1**.)

Routes 1-3, will cross canals and ephemeral drainages. (Ex. 19A, Part II, p. 9.) Transmission Route 1A (Route 1A) crosses several ephemeral channels and the California Aqueduct. *(Ibid.)* Route 1B and its proposed Variation (Route 1C) will cross fewer ephemeral channels; however, it will cross over the California Aqueduct, Kern River Flood Canal, the Florida Drain, the Weed Island Ditch, the Arizona Ditch and the Depot Drain. *(Ibid.)* Route 2, the water supply line, crosses eight ephemeral channels, and Route 3, the wastewater pipeline, crosses one. *(Ibid.)*

Those drainages that are considered waters of the United States under the Clean Water Act include the Kern River Flood Canal and certain small intermittent drainages near the California Aqueduct. (Ex. 19A, Part II, p. 9.) Applicant has received Nationwide Permit (NWP) No. 26 from the U.S. Army Corp of Engineers for transmission-line construction disturbances associated with drainages in U.S. waters. Applicant estimates that these activities will require the temporary

disturbance of 0.45 acres. (*Ibid.*) NWP-26 allows the discharge of dredged or fill material into headwaters and isolated waters that disturb three acres or less. (*Ibid.*) General conditions for NWP-26 include the requirements that:

- appropriate erosion and siltation controls be implemented;
- discharges of fill may not impede high flows; and
- any temporary fills must be removed and the area returned to preexisting conditions. (*Ibid.*)

The State Water Resources Control Board (SWRCB), under Section 401 of the Clean Water Act has not certified certain NWP s, including number 26, as consistent with state water quality standards. (Ex. 19A, Part II, p. 9.) Therefore, the Central Valley Regional Water Quality Control Board (CRWQCB) must provide a 401-certification prior to the NWP-26 being valid. (*Ibid.*) CRWQCB staff has reviewed Applicant s 401-certification application and related additional submittals; Staff indicated, however, that a final certification would not be issued until after Energy Commission approval of the project. (*Ibid.*)

In addition, a Streambed Alteration Agreement (SAA) will be required from the California Department of Fish and Game (CDF&G) for transmission line construction activities that will cross the Kern River Flood Channel and other small intermittent streams in the Elk Hills area. (Ex. 19A, Part II, p. 97.) CDF&G has issued a draft SAA, which addresses vehicle stream crossings on several drainages and the possible construction of support structures on or near stream banks. (Ex. 19A, Part II, pp. 9-10.)

Measures addressing soil and water resource concerns identified under general provisions in the draft agreement include:

- all work will be completed while the streams are dry;
- disturbance or removal of vegetation shall not exceed the minimum necessary to complete the operation;
- no trees or shrubs shall be removed or affected because of this project;

- vehicles will not be driven or equipment operated in water-covered portions of the stream, or where wetland vegetation, riparian vegetation or aquatic organisms may be destroyed;
- stream channels will be returned to pre-project conditions to the extent possible;
- silty water will not be discharged to or created within the stream; and
- temporary stream diversions will ensure sufficient downstream flow to support aquatic life.

Staff, therefore, concluded that implementation of the measures identified in the NWP-26 (as certified by the CRWQCB) and the SAA would mitigate any potential adverse impacts to the area's soils from wind and water. (Ex. 19A, p. 20.)

1. Water Supply

WKWD is the sole water supply source for the proposed project, which will require 3,180-acre feet per year (AFY). (3/9 RT 77:21-79:1; Exs. 19A, Part II, pp. 5, 10 and App. N; 18, pp. 20, p. 2.) WKWD will supply Applicant's needs with groundwater that it produces from its well field in the Tupman area. (Ex. 19A, Part II, p. 10.)

Water storage on site will consist of a raw water storage tank with a million-gallon capacity. (Ex. 19A, Part II, p. 10.) Approximately 630,000 gallons will be available to cover a 5-hour water supply interruption. (*Ibid.*) The remaining 370,000 gallons of water will be dedicated to the plant's fire protection system. (*Ibid.*)

The salient features of the WKWD are that it:

- covers approximately 250 square miles of western Kern County;
- serves 6,500 domestic customers residing in the Cities of Taft and Maricopa, and a number of unincorporated communities;
- serves approximately 400 major industrial users;
- obtains its water supply from local groundwater wells through a groundwater banking and recharge program agreement with the Buena Vista Water Storage District (BVWSD), and through a subcontract with the Kern County Water Agency (KCWA);
- has approximately 230,000 acre-feet of water currently banked;

- has never drawn water against the bank;
- has a current State Water Project (SWP) entitlement of 25,000 acre feet per year;
- has an additional 10,000 acre-feet entitlement under the SWP contract during wet years when high flow water is available from the Delta;
- has other water sources, which may be available by agreement with water agencies and other entities throughout Kern County; and
- has a recharge obligation for groundwater withdrawals over 3,000 acre feet per year. (Ex. 19A, Part II, p. 10.)

Mr. Brian Patrick, Director of Operations for WKWD testified for Applicant. In his testimony, Mr. Patrick explained that WKWD is one member of the 16 member-unit KCWA, which is the responsible water management agency for Kern County. (Exs. 20, Att. A; see *also* 18, pp. 6-7.) KCWA sells water to its member water districts that supply water to end-users. (*Ibid.*) KCWA has the master contract with the state to obtain allotted SWP water from the California Aqueduct. (Ex. 18, p. 6.) KCWA under a subcontracting agreement then sells SWP water to WKWD.¹¹¹ (*Id.*, at pp. 6-7.) With its water purchase, WKWD then serves its customers in the McKittrick-Taft-Maricopa areas, and by contract, the Elk Hills Oil and Gas Field. (Exs. 20, Att. A; see *also* 18, pp. 6-7.) In addition, WKWD maintains several historical agreements with the BVWSD concerning usage of the local groundwater basin.

¹¹¹ Through its subcontract with the KCWA, WKWD is entitled to 25,000 acre-feet of SWP water per year. (Exs. 19A, Part II, p. 6; 18, pp. 6-7.) An additional 10,000 acre-feet of SWP water, known as interruptible water, is also available to WKWD during wet years. (*Ibid.*)

WKWD in 1965 entered an agreement with BVWSD to limit WKWD's net groundwater withdrawals from the basin to 3,000 AFY. (Ex. 18, p. 5) The amount of 3,000 AFY is based on WKWD's historic withdrawals prior to 1966, and it cannot be banked. (*Id.*, at p. 6.) Therefore, WKWD uses this water first in any given year. (*Ibid.*)

In conjunction with the BVWSD, WKWD uses SWP water for its groundwater banking and recharge program. (3/9 RT 75:15-79:11; Exs. 19A, Part II, p. 5 and App. N; 18, pp. 6-7 and Ex. D.) As part of the agreement with WKWD, BVWSD delivers WKWD's SWP water from the California Aqueduct to its landowners instead of pumping local groundwater. (Exs. 19A, p. 6; 18, p. 7.) WKWD then can pump or bank a volume of groundwater equivalent to the amount of SWP water supplied to BVWSD. (*Ibid.*)

The availability of SWP supplies is variable and subject to cutbacks during drought years. (3/9 RT 75:15-79:11; Exs. 19A, Part II, p. 5 and App. N; 18, pp. 6-7 and Ex. D.)¹¹² WKWD attempts each year to obtain the maximum amount of SWP water available and is usually able to bank all of its SWP water through the banking agreement with BVWSD. (*Ibid.*) **Soil & Water Resources Table 2** shows the amount of SWP water received, water acquired from other sources, water demand, and water banked for water years 1990 through 1996.

Since 1990, WKWD has banked on average over 12,000-acre feet per year through its agreement with BVWSD. (Ex. 19A, Part II, p. 7.) Its current bank of water is approximately 230,000 acre-feet, and it has never drawn against the banked water supply. (3/9 RT 78:18-79:1.)

¹¹² The WKWD normally sells water to clients within the district, and the proposed plant is outside the boundaries of the district. (3/9 RT 158:7-179:17.) As such, the proposed project would face curtailment first among residential and industrial customers in case of a water shortage. (*Ibid.*) WKWD therefore plans to annex the site into the district after the Energy Commission proceedings are concluded. (*Ibid.*)

SOIL & WATER RESOURCES Table 2

West Kern Water District Water Supply (acre-feet)

Water Year	SWP Entitlement	SWP Interruptible	Tehachapi-Cummings	Water Purchased	Water Sold	Water in Bank
1990-1991	24,348	0	5,477	29,825	10,948	155,488
1991-1992	10,464	32	1,792	12,289	14,755	155,408
1992-1993	9,496	0	5,310	14,806	12,335	160,137
1993-1994	19,523	5,387	2,325	27,235	12,317	174,484
1994-1995	19,838	5,465	5,050	30,353	11,334	194,956
1995-1996	25,000	0	0	25,000	13,239	216,503
1996-1997	25,000	-	-	25,000	13,843	229,133
1997-1998	25,000	-	-	25,000	13,385	216,556
Total	108,705	10,884	19,945	139,508	74,928	-
Average	18,118	1,814	3,326	23,251	12,488	13,165

Source: (Ex. 19, Part II, p. 6.)

Both districts recharge the basin using spreading ponds and the Kern River Channel near WKWD s well field. (Ex. 19A, Part II, p. 7.) Groundwater levels near WKWD s well field have varied greatly over the last five years due to changes in production as well as due to recharge. (*ibid.*) The groundwater pumped by the district from their wellfield is typically sodium bicarbonate water with low levels of total dissolved solids (TDS) and generally meets drinking water standards. (*ibid.*)

WKWD s well field is located approximately 15 miles northeast of Taft in the Tupman area. (Ex. 19A, Part II, p. 7.) Total peak production capacity of the six active wells is 99 acre-feet per day, but maximum daily usage averages approximately 41.5 acre-feet per day. (*ibid.*)

Although the Elk Hills Oil and Gas Field is located outside the boundary of WKWD, the former Naval Petroleum Reserve-1 (NPR-1) had a guaranteed purchase agreement with the district for between 0.9 up to 1.9 million gallons per day. (Ex. 19A, Part II, p. 6.) The average annual purchase has been

approximately 1.25 million gallons per day or about 1,300-acre feet per year. (*Ibid.*) The Occidental and Chevron Oil Companies that purchased NPR-1 have maintained this purchase agreement. (*Ibid.*)

On cross-examination, Mr. Patrick testified that as a policy WKWD sells water to customers within the boundaries of the district. (3/9 RT 158:20-159:3.) He stated that WKWD had served the former NPR-1 for a number of years, and had planned to annex it to the WKWD. (*Ibid.*; 3/9 RT 158:7-159:4; 3/9 RT 175:19-179:17.) Mr. Patrick testified that WKWD could continue to serve the property with water but that its priority would be less than residential and industrial customers in case of a water shortage. In case of a water shortage, industrial customers would face water curtailment so that WKWD could serve its residential customers, and industrial clients outside WKWD would be curtailed before those within. (*Ibid.*)

2. Applicability of State Water Resources Control Board Resolution 75-58 (SWRCBR 75-58).¹¹³

CURE contends that SWRCBR 75-58 has a mandatory application to the Energy Commission and that:

[t]he Commission can only approve the use of fresh inland waters for cooling the Elk Hills powerplant if other sources or other methods of cooling would be environmentally undesirable or economically unsound. To make this determination, the Commission must consider an analysis of the cost and water use associated with the use of alternative cooling facilities employing dry, or wet/dry modes of operation. (Ex. 39, pp. 2-3.)

CURE argues that because Staff has identified other feasible alternatives to using fresh water cooling, these options must be explored to determine if economic and environmental factors would allow for their application under

¹¹³ The full text of SWRCBR 75-58 is provided as an Appendix to this Decision, as are the relevant statutory provisions. Of particular note is that SWRCBR 75-58 directs SWRCB staff to

SWRCBR 75-58. (Ex. 39, p. 3.) CURE also argues that the proposed project location in the Elk Hills Oil and Gas Field makes it accessible to:

- 6 million gpd of groundwater that is currently extracted for oil production;
- 4.3 million gpd of produced water; of which
- 3 million gpd is disposed of in the Elk Hills Oilfield.¹¹⁴ (Ex. 39, pp. 3-4; 5-6.)

In addition, CURE argues that alternative technologies are available employing dry, or wet/dry modes of operation and that should be applied in place of fresh inland waters under SWRCBR 75-58. (Ex. 39, p. 4.)¹¹⁵

In order to assess the applicability of SWRCBR 75-58 to these proceedings, Staff conferred with Ms. Sheila Vassey, a SWRCB staff attorney for 20 years. (5/2 RT 31:17-41:6; Ex. 19C, App. B.) She responded by electronic mail to CEC staff member Joe O Hagen as follows:¹¹⁶

This phrase is contained in Principle 7¹¹⁷ of the State Water Boards s Water Control Policy on the Use and Disposal of Inland Waters for Powerplant Cooling (1975). That principle states that the State Water Board will approve the use of ***inland waters*** for powerplant cooling only when it is demonstrated that the use of other water

coordinate closely with the Energy Commission and other involved state and local agencies to implement the policy.

¹¹⁴ CURE cites Division of Oil, Gas, and Geothermal Resources (DOGGR) statistics for this proposition and argues that this amount of water is nearly sufficient to supply the project s water demand of 3.1 million gpd. (Ex. 39, pp. 5-6.) Applicant argues that this water is unsuitable for cooling tower makeup. (3/9 RT 115:17-116:9.)

¹¹⁵ Prior to the May 2, 2000 hearing on water resources, the Committee on April 21, in response to various motions from the parties, issued an Order which directed the parties to brief whether SWRCBR 75-58 applies to these proceedings.

¹¹⁶ Ms. Vassey s response was in the context of Commissioner Moore s directive to the parties to brief the meaning of the term *economically unsound* in the context of wet versus dry cooling under an analysis of SWRCBR 75-58 s applicability. (3/9 RT 249:4-258:5; see Elk Hills Committee Order dated April 21, 2000.)

¹¹⁷ In her testimony before the Committee, Ms. Vassey pointed out a typographical error in her e-mail to CEC staff member Joe O Hagen: Principle 7 should have read 2. (5/2 RT 35:4-15.)

sources or cooling methods would be environmentally undesirable¹¹⁸ or economically unsound. (Ex. 19C, App. B; *emphasis added.*)

I was not able to come up with anything. In researching the State Water Board's old legal memoranda, I came across a series of 1989 memos on a proposed Pacific Gas and Electric Fossil 1 and 2 project. These memos indicate that the State Water Board's overriding concern with the project was the proposed use of **fresh water** for powerplant cooling. The memos do not, however, discuss whether the use of other sources would be economically unsound or otherwise provide enlightenment on the subject.

I would agree with you that to demonstrate economic unsoundness, it would probably **not** be necessary to show economic infeasibility. According to a State Water Board economist, **economically unsound** is a subjective term that is not used by Economists. It implies some kind of balancing of costs and benefits, which are not identified in the State Water Board's policy. (5/2 RT 35:16-36:15; Ex. 19C, App.B.)

In response to Applicant's question about SWRCBR 75-58's application, Ms. Vassey stated that:

Well, to the best of my knowledge, I don't--I could not come across an order, as I said, in which--discussing the policy, so it does not appear that it's been applied very much. (5/2 RT 37:2-14.)

Moreover, in responding to CURE's inquiry about SWRCBR 75-58's application to the Elk Hills proceeding, the SWRCB's Acting Chief Counsel, Craig M. Wilson, responded as follows:

As you indicate in your letter, Resolution 75-58 was adopted as state policy for water quality control pursuant to Water Code section 13140. **It is still in effect and applicable to all state agencies under Water Code section 13146. Also applicable are Water Code sections 13550 et seq. which deal with the reuse of recycled water.** (Emphasis added.)

¹¹⁸ The Committee ruled in a separate Order that CURE had waived the right to present any evidence on the subject of environmentally undesirable within an analysis of SWRCBR 75-58. (See Elk Hills Committee Order dated May 16, 2000.)

The SWRCB did not offer further guidance on SWRCBR 75-58 and its application to siting cases.

Applicant argues that SWRCBR 75-58 s language in Principle 2-- [w]here the Board has jurisdiction, use of fresh inland waters for... --refers to a new water allocation, which the SWRCB must approve, for the [B]oard to have jurisdiction.¹¹⁹ (3/9 RT 107:4-109:9; Applicant's Opening Brief on Phase II issues, pp. 15-21; Reply Brief pp. 5-7.) Assuming, *arguendo*, that SWRCBR 75-58 applies to groundwater (we have expressly found that it does not), Applicant argues that the Board would not have jurisdiction, because there is no new water **allocation**.¹²⁰

The evidence of record is that WKWD already has:

- its contracted for SWP water allocation;
- sufficient water on hand to supply Elk Hills; and
- no requirement for any new allocation.

CURE disputes Applicant s argument with contentions that:

- all state agencies must comply with state policy for water quality control under the directive of Water Code section 13146;
- the SWRCB s wide ranging jurisdiction to exercise the adjudicatory and regulatory functions of the state in the field of water resources should extend to the Energy Commission when it is making determinations under its siting authority;
- the inconsistent application of SWRCBR 75-58 in our other cases where the policy was applied even though there was no new water allocation; and
- as the exclusive authority over powerplant siting decisions, the Commission steps into the SWRCB s shoes to determine an

¹¹⁹ Applicant argues alternately that SWRCBR 75-58 is not applicable at all to the Energy Commission, and it is merely to be used as guidance in our proceedings. We likewise reject this approach because SWRCBR 75-58 has provisions for waste water disposal. These provisions are applicable to the Energy Commission whether or not the water use provisions are applicable in any given case.

¹²⁰ Staff has adopted this position as well. (Staffs Opening Brief on Phase II issues, p. 6.)

applicant's compliance with the powerplant cooling policy. (CURE's Opening Brief on Phase II issues, p. 3; Reply Brief pp. 22-23.)

Staff's position on SWRCBR 75-58 includes the following:

1. **where the SWRCB has jurisdiction**, use of fresh inland waters for powerplant cooling will be approved only when it is demonstrated that the use of other water sources or other methods of cooling are environmentally undesirable or economically unsound.
2. Staff is discussing with the [SWRCB] a definition [for the terms environmentally undesirable or economically unsound] and hopes to have a reply shortly.¹²¹
3. The SWRCB policy also calls for water availability studies for projects to be constructed in the Central Valley to consider potential impacts on Delta outflow and water quality objectives. **Since the project is proposing to use groundwater**, staff anticipates that this source will have no effects on Delta outflow or water quality objectives. (Ex. 19, Part II, p. 16, emphasis applied.)

In conjunction with SWRCBR 75-58, the parties examined relevant provisions of the California Water Code. Water Code section 13550 provides that use of potable domestic water for industrial uses is an unreasonable use of the water if recycled water is available, meets quality standards, and is economically feasible for the purpose sought.

Further, Water Code section 13552.6 specifies that the use of potable domestic water for cooling towers is an unreasonable use of water if recycled water is available for this purpose. Water Code section 13552.8 authorizes any public agency to require the use of recycled water in cooling towers if it is available

¹²¹ In Supplemental Testimony on Soil and Water Resources, Staff acknowledged that it was unable to define further these terms beyond the description provided by SWRCB staff attorney Sheila Vassey in her testimony. (3/9 RT 202:9-203:14; Ex. 19B, p. 5; & 19C (Att. A. Supplemental Testimony), App. B.)

under the conditions set forth in section 13550.¹²² Water Code section 13555.3 provides for separate water-delivery systems on private property for potable and recycled, nonpotable uses.

Alternative Water Supply Sources

The parties reviewed potential alternative water supply sources in conjunction with their analysis of pertinent Water Code provisions. Applicant evaluated five alternative water supply sources as follows:

1. Elk Hills produced water;¹²³
2. Brackish groundwater from the Tulare Formation;
3. Buena Vista Water Storage District (BVWSD) groundwater;
4. Kern County Water Authority (KCWA) groundwater; and
5. WKWD groundwater. (3/9 RT 81:22-82:12; Ex. 36.)

Elk Hills Power Vice President Joe Rowley testified that the evaluation under SWRCBR 75-58 looked at availability, infrastructure requirements such as new wells, pipeline length and route, water handling, and relative capital and operation and maintenance costs. (Ex. 19A, Part II, p. 82:13-86:10.)

Mr. Rowley testified that the produced water from OEHI oil operations had a salinity value of 20,000 to 40,000 TDS, or 2-4 percent salt, which is more than sea water. (3/9 RT 86:11-87:20.) Mr. Rowley stated the OEHI was unwilling to make the water available and combined with its poor salinity, was a poor choice for cooling tower makeup, much of which is evaporated. (*ibid.*)

¹²² Recycled water means water, which, because of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur, and is therefore considered a valuable resource. (Water Code, / 13050 (n).) Beneficial uses include power generation. (Water Code, / 13050 (f).)

¹²³ Produced water is brackish, natural water pumped up with oil from OEHI s oilfield operations. (3/9 RT 86:11-13.) Applicant contends that OEHI is unwilling to make this water available to the proposed project. (3/9 RT 87:1-20; 153:1-19; Ex. 36.)

Mr. Rowley testified that brackish groundwater from the Tulare Formation was available, and that water was not nearly as saline (in the range of 4,000-6,000 TDS) as produced water. (3/9 RT 87:21-94:16, see Ex. 36.) However, Mr. Rowley stated that because its TDS was much higher than WKWD water, Tulare Formation water was subject to being recycled for cooling purposes only half as much. (*Ibid.*) He stated that approximately six new water supply wells would be needed to pump the greater volume of brackish water that would be required.¹²⁴ (*Ibid.*)

Mr. Rowley also asserted that use of Tulare Formation groundwater would require additional water treatment and incur higher capital, and operation, and maintenance costs. (3/9 RT 88:9-94-16.) In addition, even if another source of water was required, Applicant would still anticipate using WKWD banked water for the powerplant steam cycle s higher quality water need. (3/9 RT 99:11-23; 5/2 RT 79-13-80-18.) Therefore, the proposed source water pipeline from WKWD s facility would still be required. (*Ibid.*)

Environmental costs from use of Tulare Formation groundwater would deal mainly with impacts on groundwater resources from pumping, interference with other wells, drift emissions and impacts with deep well injection of a significantly higher TDS degraded water back into the ground. (3/9 RT 89:3-93:8.)

Staff's witness, Joe O Hagen, clarified that:

- there are no wastewater treatment plants in the region that could supply the project;
- irrigation return flows are too small and erratic over the course of a year to be a suitable supply;

¹²⁴ No additional wells would be required to pump SWP banked groundwater from the WKWD. (Ex. 36.)

- produced water from the Tulare Formation in the Elk Hills Oil and Gas Field with a TDS of 20,000 to 40,000 mg/l is not a source of an alternate water supply;¹²⁵
- Lower Tulare Formation groundwater with a TDS of 4,000-5,000 mg/l is a potential source of an alternate water supply;
- the use of dry cooling or wet/dry cooling would provide an environmental benefit through the reduction of water demand;
- the use of dry cooling or wet/dry cooling may impose an economic burden on Applicant, which would offset the reduction of water demand; and
- without further guidance as to the meaning of the terms *economically unsound*, SWRCBR 75-58 is "not very useful." (3/9 RT 192:16-197:5; Ex. 19, Part II, p. 15.)

In its LORS analysis, Staff did not comment specifically on Water Code sections 13140, 13146, or 13550. Instead, Staff simply cited and provided a general overview of the Porter-Cologne Water Quality Control Act (Water Code sections 13000 et seq.), which focus primarily on waste discharges.¹²⁶ (Ex. 19A, Part II, p. 2.) The Committee did not find this approach particularly insightful or helpful to our analysis of the pertinent provisions.

3. Alternate Cooling Technologies

CURE contends that over 700 air-cooled condensers are in operation worldwide, a fact that CURE claims demonstrates dry cooling is economically sound. (Ex. 39, p. 7.) CURE acknowledges that the capital cost of a dry cooling system is typically higher than a wet cooling system due to certain added system requirements. (Ex. 39, p. 6.) CURE performed a cost analysis of the wet versus dry cooling option, which purported to show that 100 percent dry cooling would

¹²⁵ Staff found that use of such brackish water in cooling towers presents significant problems, not only with cooling tower operation, but also with wastewater disposal. (Ex. 19A, Part II, p. 15.) Mr. O Hagen explained that the SWRCB defines brackish water as ranging from 2,000 to 30,000 mg/l in TDS. (*Ibid.*) SWRCBR 75-58 states, however, that application of the term *brackish* to a water is not intended to imply that the water is no longer suitable for industrial or agricultural purposes.

¹²⁶ There is no dispute but that SWRCBR 75-58 applies to waste discharges. As Staff noted in the FSA, however, the EPA will be permitting the proposed project's injection wells so that any SWRCB waste discharge requirement is not likely to be required. (Ex. 19A, Part II, p. 2.)

increase the capital cost of the proposed project by approximately 2.7 million dollars. (Ex. 39, pp. 6-8 & Table 1.)¹²⁷

In addition, CURE argues that 100 percent dry cooling is the most expensive option of the various options available to Applicant. Other options according to CURE include hybrid systems employing parallel combinations of wet/dry cooling technology, which may reduce evaporative water demand up to 90 percent or more. (Ex. 39, pp. 6-7.)

a. Wet Cooling

Applicant proposes to use a wet cooling tower to condense the steam exiting the steam turbines in order to maintain the lowest possible condenser vacuum and achieve maximum operational efficiency. (Ex. 19A, Part II, p. 16.) The heat rejection mechanism in wet cooling towers is primarily the evaporation of water to the atmosphere. (*Ibid.*)

CURE challenges the choice of wet cooling. In the words of Dr. Fox:

Combined cycle powerplants use both a gas turbine and a steam turbine to produce electricity, with the latter producing about one-third of the net output. The steam from the steam turbine must be condensed to water, which is done using a surface condenser, and cooled, which is done with a cooling tower in a conventional wet cooling system. The Elk Hills project has proposed to use a wet cooling tower to remove this heat. In this process, steam is condensed in a surface condenser and the resulting hot water is sprayed over a packing in a cooling tower to bring it into direct contact with air. This evaporates about 85% of the hot water, cooling the air and the remaining water. This evaporative water demand, which amounts to 2.7 million gallons per day for the Elk Hills project, can be eliminated by using dry cooling or substantially reduced using a parallel wet/dry cooling system. (Ex. 39, p. 6.)

¹²⁷ Applicant took issue with certain parts of Table 1; however, those issues are not pertinent to our analysis here. (3/9 RT 117:1-120:3.)

Applicant took issue with CURE's formulation as follows:

[CURE has] apparently a misunderstanding of how a powerplant works. [CURE states] the Elk Hills project has proposed to use wet cooling to remove this heat. In this process, steam is condensed in a surface condenser, and the resulting hot water is sprayed over a packing in a cooling tower.

That's certainly not the case. The--the steam that's condensed in the surface condenser is pumped back to the boiler, and is reused in a continuous cycle. The water that-- that is sprayed in the cooling tower is the circulating water, and that's the water that really I've been talking about throughout my testimony today. (3/9 RT 11610-25.)

We believe Applicant's testimony to refer to its water conservation measures.¹²⁸ In either case, we discern only a dispute about mechanical operation rather than a dispute as to the amount of water being evaporated.

b. Dry Cooling

In the direct dry cooling system, steam exhausts from the turbine to a manifold radiator system. (Ex. 19C, p. 9.) The steam condenses in the radiator system as heat is conducted through the pipe walls to the atmosphere. (*Ibid.*) Because the steam is condensed directly in the radiator system, and is returned to the boiler as feed water, direct dry cooling does not require a huge volume of circulating cooling water. The closed system does not experience water losses due to evaporation. Additionally, without evaporation, the cooling water system does not become concentrated with salts and impurities, requiring additional losses through a blow-down stream. Therefore, dry cooling does not require the large volumes of make-up water that are necessary in wet cooling systems. Nor does it require ancillary systems to control biological growths, and control water chemistry to the same degree as does a wet cooling tower. (*Ibid.*)

¹²⁸ In his prefiled testimony, Mr. Cronk stated that the project complies with Water Code section 461, which requires water users to conserve and reuse available water supplies. (Ex. 20; Cronk

An indirect dry cooling system uses a secondary working fluid to transfer the heat from the steam cycle to the atmosphere. (Ex. 19C, p. 10.) In the indirect cooling system, a closed cycle system extracts heat from the condenser and rejects the heat through a radiator system. (*Ibid.*) The secondary working fluid can be water, ammonia, or a fluid/mixture with heat transfer and properties suited to the temperatures and heat transfer regime. (*Ibid.*)

c. Wet/Dry Hybrid Towers

Wet/dry hybrid cooling towers use both an evaporative system and a radiator system to reject heat from the condenser. (Ex. 19C, p. 10.) The ratio of dry to wet depends on the ambient conditions and the desired heat rejection, water savings, or visible plume reductions. (*Ibid.*) Because the dry radiator system rejects heat into the air moving through the tower without adding moisture, it is often used in series or parallel with the wet portion to control visible plume formation. The key to the hybrid system is controlling the two systems to achieve the desired heat rejection (operational constraints), visible plume reduction, and/or water savings while balancing pump and fan loads. (*Ibid.*)

In a series configuration, a wet/dry hybrid cooling tower evaporative section rejects heat by evaporating water into the air to levels approaching saturation. (Ex. 19C, p. 10.) If this saturated, or near saturated, air were immediately rejected into the environment, the warm plume would rise, and become visible as the moisture in the plume cooled and condensed. (*Ibid.*) By arranging the tower in series, the dry radiator section rejects additional heat into the saturated air stream without adding additional moisture. The air stream then exits the tower at a higher temperature and lower relative humidity, compared to a wet-only system, which will take longer to cool to the point of condensing. This additional

testimony, Att. B, p. 3.) He states that Applicant's water conservation measures include reuse of cooling tower water by recycling a minimum of six times. (*Ibid.*)

time can allow the plume to dissipate before a visible plume has time to form. (*Ibid.*)

In a parallel configuration, the heat rejection mode depends on the meteorological conditions. (Ex. 19C, p. 11.) Cool ambient air temperatures, that generally promote visible plume formation, are also those conditions that improve the heat rejection effectiveness of dry cooling systems. Visible plumes are less likely to form during warmer ambient air temperatures. (*Ibid.*) Warmer air can hold more moisture, thereby improving the cooling potential from the evaporative wet cooling tower. (*Ibid.*) The control logic balances the ambient conditions and plume control with the desired cooling system performance by rejecting heat in both towers, at some ratio, or in one tower exclusively. (*Ibid.*)

4. Costs of Alternate Cooling Technologies

(a) Applicant

In terms of efficiency, Mr. Rowley explained that operation of a dry cooled facility would mean a decrease in overall output of 21 megawatts. (3/9 RT 94:97-15.) Sixteen megawatts would be lost due to the steam turbine's reduced efficiency loss from having to operate under higher temperatures and pressure because of dry cooling. Five megawatts would be lost to powering auxiliary equipment such as large fans needed to provide cooling air. (*Ibid.*)

In terms of capital costs, Mr. Rowley put the additional cost estimate for dry compared with wet cooling at approximately 15 million dollars.¹²⁹ (3/9 RT 97:22:99-25; 148:11-150:1; 166:14-170:25.) When Applicant performed its own

¹²⁹ Applicant later clarified that its own cost analysis assumed a net output loss of 6.5 megawatts throughout the year based on a constant 0.75 inches of mercury increase in steam turbine backpressure employing dry cooling. (5/2 RT 73:1875:7; Ex. 40 & Table A.) Fuel consumption for a given amount of power likewise rises. (3/9 RT 97:17-19.)

analysis based on the alternative presented by CURE, it revealed a net present value for dry cooling that is \$29.6 million more than the costs of the proposed project. (5/2 RT 45-12; 50:13; 52:5-53:10; Ex. 40 & Table A.)

As to a straight comparison between the proposed project and dry cooling using water supplied by WKWD, Applicant's analysis demonstrated a higher cost differential for dry cooling of \$19.7 million dollars. (5/2 RT 45-12; 50:13; 52:5-53:10; Ex. 40 & Table A.)

(b) Staff

Staff concurred with Applicant that, in general, dry and hybrid-cooling towers are more expensive than a wet system. (5/2 RT 92:12-; 93:12; Ex. 19C, pp. 6-11.) For hybrid systems, which basically require the design and construction of two cooling systems, costs range from less to more than dry cooling systems, depending on the ratio of wet to dry cooling in the hybrid design. (*Ibid.*) The initial cost differences are due to:

- the dry condenser, or heat exchanger;
 - the taller structures for dry and hybrid cooling systems;
 - complex control systems for wet/dry cooling towers; and
 - larger fans and motors for dry and hybrid cooling systems.
- (Ex. 19C, p. 11.)

Mr. O Hagen testified that, based upon his analysis of previous projects, dry cooling capital costs are two to three times higher than those of wet cooling. (3/9 RT 203:24-205:23.) In terms of actual numbers, Mr. O Hagen testified that estimates he had been given in previous cases for dry cooling costs exceed those of wet cooling in the range of 15-25 million dollars. (*Ibid.*)

(c) CURE

CURE's expert witness, Dr. J. Phyllis Fox, has extensive credentials in the field of water supply, and she disputed Applicant's contention that it would suffer a 21-megawatt diminution in power due to dry cooling. (3/9 RT 207:17-212:19.) (3/9 RT 214:25-216:5; Ex. 39 & Table 1.) Dr. Fox stated that Applicant's model was based on worst case predictions that would not occur throughout the year. Instead, Dr. Fox stated that her analysis showed an annual loss of only 10 megawatts. (*Ibid.*) As to parasitic power loss for running cooling fans, Dr. Fox's analysis calculated a loss of three megawatts (contrasted with Applicant's total estimate of five megawatts). (*Ibid.*) Moreover, Dr. Fox contended that these efficiency losses are irrelevant. (3/9 RT 216:8-217-14.) She based her view on the Applicant's capacity to fire duct burners to increase output and to offset any efficiency reductions due to dry cooling. (*Ibid.*)

As to capital costs, Dr. Fox testified that the cost differential for the cooling portion of the equipment utilized for dry cooling exceeds the cost of wet cooling equipment by six to 10 million dollars. (3/9 RT 214:7-18.) For the proposed project, Dr. Fox's dry cooling cost analysis produced a cost differential for installed capital costs of approximately six million dollars. (3/9 RT 235:12-236:23; Ex. 39, Table 1.) In terms of total capital costs between wet and dry cooling, however, Dr. Fox's analysis shows that 100 percent dry cooling would increase the capital costs of the project by approximately 2.7 million dollars. (3/9 RT 78:20-21; Ex. 39, p. 8 & Table 1.)

5. Water Quality and Wastewater Disposal

Wastewater from the Elk Hills project will consist mainly of cooling tower blowdown, which is nonhazardous. (See **Tables 3 & 4**¹³⁰ and note 7 below.)

¹³⁰ **Table 2** above shows the estimated volumes of wastewater effluents.

Incorrect disposal of wastewater or inadvertent chemical spills can degrade soil, surface water, and groundwater. (Ex. 19A, Part II, p. 11.) Applicant plans to dispose sanitary waste to a septic system and leachfield. (*Ibid.*) All other liquid waste generated by Applicant will be disposed through the use of two injection wells (T31S T24E Section 18) located approximately four miles south of the power plant site. (Ex. 19A, Part II, p. 11.)

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SOIL & WATER RESOURCES Table 3
Estimated Wastewater Volumes to be Injected

Waste Stream	Daily Average	Daily Maximum
Cooling Tower Blowdown	430,000 gpd	537,500 gpd
Floor Drains	58,000 gpd	72,500 gpd
Demineralization Wastes	15,000 gpd	18,500 gpd
Storm Water Runoff	Minimal	n/a
Total to Injection Well	503,000 gpd	628,500 gpd

Source: (Ex. 19A, Part II, p. 12.)¹³¹

SOIL & WATER RESOURCES Table 4
Estimated Wastewater Characteristics

Waste Stream Characteristics — mg/l				
Stream	Cooling Tower Blowdown	Demin. Regen. Waste	Floor/Interim. Storm Drains	Combined Waste
Calcium	97.1	164.0	16.4	94.7
Magnesium	4.1	7.0	0.7	4.0
Sodium	336.5	1985.0	56.8	461.2
Potassium	14.2	24.0	2.4	13.9
Barium	0.0	0.0	0.0	0.0
Strontium	1.2	2.0	0.2	1.2
Iron	1.3	2.0	0.2	1.2
Boron	2.4	4.0	0.4	2.3
Bicarbonate	100.0	803.0	80.3	163.9
Chloride	257.0	434.0	43.4	250.7
Sulfate	285.5	3290.0	0.4	536.8
Silica	128.5	217.0	21.7	125.4
Borate	12.4	21.0	2.1	12.1
Phosphate	0.8	1.0	0.1	0.8
PH	7.6	6.0-8.5	7.5	6.0-8.5
TDS	1241.1	6954.0	225.1	1668.2
TSS	75.0	25.0	75.0	70.3
Oil & Grease	0.0	0.0	11.0	1.2

Source: (Ex. 19A, Part II, p. 12.)

Concerns about injection well disposal mainly focus on the potential for degrading groundwater, especially potential sources of drinking water. (Ex. 19A, Part II, p. 12.) The feasibility of using injection wells relates to the potential for well clogging, blowouts from excess pressure and chemical reactions between fluids in the receiving formation and the wastewater. (*ibid.*)

¹³¹ In applying a conversion factor of 1 acre-foot = 326,000 gallons, a daily maximum of 628,500 gallons per day (gpd) would convert to (628,500 / 326,000=1.92) almost 2 acre-feet per day or 720 AFY (360 days x 2 acre-feet = 720), or roughly 21,600 maximum acre-feet over the proposed 30-year life span of the facility (720 x 30 = 21,600).

Applicant's proposed wastewater injection operations will affect groundwater within the Tulare injection zone. (3/9 RT 123:6-140-24; 189:4-191:23; Ex. 20, Atts. A & B to prefiled testimony of Donna M. Thompson and Barry Hanson regarding proposed Class 1 Injection Wells.) The well drilling and construction will be approved by the EPA. The DOGGR has exempted the Tulare Formation as a source of drinking water within the boundaries of the Elk Hills Oil and Gas Field based upon the presence of petroleum products. (*Ibid.*) In the proposed Tulare injection zone, groundwater has TDS greater than 3,000 mg/l and high concentrations of chloride and boron. The proposed injectate is expected to have a TDS concentration of 1,200 mg/l. (See Soil & Water Resources Table 4.)

Applicant filed an application for a Class V injection well permit with the Central Valley Regional Water Quality Control Board (CVRWQCB) and the U.S. Environmental Protection Agency (EPA). (Ex. 19A, Part II, pp. 11-12.) EPA indicated that it will be the permitting agency for the injection wells, and that the wells will be permitted as Class I wells.¹³² (*Ibid.*) The CVRWQCB found the application complete. (Ex. 19A, Part II, pp. 11-12.)

In light of the fact that EPA will be the permitting agency, once EPA has issued the permit, CVRWQCB may propose a resolution to waive waste discharge requirements. (Ex. 19A, Part II, p. 12.) The new wells (one well will be used as a back-up) are proposed near existing injection wells for oil and gas field related wastewater. (3/9 RT 186:11-187:2; Ex. 19A, Part II, p. 11.) Although injection well discharge of wastewater is often a concern because of potential impacts to groundwater, this method of wastewater disposal is commonly used in western Kern County oil fields. (Ex. 19A, Part II, p. 11.)

¹³² A draft underground injection control class 1 nonhazardous permit (UIC) from the EPA was filed in the CEC's docket unit on July 24, 2000. Class 1 wells are those wells used to dispose of wastewater to a formation beneath an underground source of drinking water. (Ex. 19A, Part II, p. 12.) An underground source of drinking water is defined (in part) as any body of groundwater containing 10,000 parts per million (ppm) or less of total dissolved solids. (Ex. 19A, Part II, p. 12; see CFR, Chap. 1, 146.3.)

The injection zone for the two wells would be in the Tulare Formation, a non-marine formation of Plio-Pleistocene age with an estimated thickness of 850 feet. (3/9 RT 123:9-140:24; Ex. 19A, Part II, p. 12.) Injection within this formation would be below the Corcoran Clay (E-Clay), a discontinuous confining layer about 25 feet thick that is within the Tulare Formation. (*Ibid.*) The confining layer is characterized as consisting of a low permeability, shale-like layer of unspecified thickness. (*Ibid.*) Groundwater within this portion of the Tulare Formation has TDS levels that range from 4,000 to 5,000 mg/l and is reported to have very little recharge from the surface. (*Ibid.*) Top perforation of the wells will be at an average of 597 feet and bottom perforation is at an average of 1,800 feet. (*Ibid.*)

To determine the direction and rate of migration of injected wastewater, Applicant assumed the injectate would move away from the wellbore in a radial pattern. The estimated average rate of movement is shown below.

**SOIL & WATER RESOURCES Table 5
Average Rate of Injectate Movement**

No. of Years	Average Rate
1 year	252 ft/year
5 years	104 ft/year
10 years	72 ft/year
20 years	50 ft/year

Source: (Ex. 19, Part II, p. 13.)¹³³

On July 13, 2000, the EPA issued a draft UIC preliminarily approving Applicant's plans. (Permit No. CA200002; docketed on July 24, 2000; see *also* 3/9 RT 187:11-188-8.) Thus the evidence indicates that EPA will likely issue final approval for the proposed injection wells. (*Ibid.*) The federal permit will contain general conditions regarding construction and operation of the injection wells as well as specific conditions including a prohibition against the disposal of

¹³³ Applicant's calculations over a 30-year period, the proposed plant life, are 1,204 feet as opposed to 994 feet. (3/9 RT 140:5-24.)

hazardous wastes in these wells. (Ex. 19A, Part II, p. 13; see also Ex. 19B, Staff Soil and Water Supplement dated March 2, 2000.)

6. Cumulative Impacts

Temporary and permanent disturbance associated with construction of the proposed project will cause accelerated wind and water induced erosion. (Ex. 19A, Part II, p. 14, see Conditions **SOIL&WATER 1-3**.) Implementation of the proposed mitigation measures, however, should ensure that the proposed project would not contribute to cumulative erosion and sedimentation impacts. (*Ibid.*)

The WKWD has sufficient banked groundwater supply to meet the water demand for the life of the project. (3/9 RT 79:12-80:5; 185:11-186:10; Ex. 19A, Part II, p. 14.) The recently approved La Paloma project will use approximately 5,500-acre feet of WKWD s SWP water allotment per year. (Ex. 19A, Part II, p. 14.) La Paloma has recently submitted an amendment to the Energy Commission regarding increasing water demand by approximately an additional 500-AFY. (*Ibid.*) This water will be directly diverted from the California canal and the increased demand would not affect Elk Hills. (*Ibid.*)

Two other proposed powerplant projects, the Midway-Sunset Power Project and the Sunrise Cogeneration and Power Project, have proposed using water from the WKWD. (Ex. 19A, Part II, p. 14.) Sunrise (98-AFC-4) proposes to use approximately 278-acre feet of WKWD water. (Ex. 19A, Part II, p. 14.) Other water demands from the Sunrise project will be met by using produced water from the oil field. (*Ibid.*)

Midway—Sunset (99-AFC-8) proposes to use approximately 3,200-acre feet of water per year. (Ex. 19A, Part II, p. 14.) These projects, in conjunction with existing demand, represent approximately 23,000 acre feet of water demand per

year, the majority of the district s annual allocation of State Water Project water, assuming full delivery. (*Ibid.*)

Mr. Patrick stated that the WKWD anticipates no increases in future water demand from other customers; in fact, demand may decline. (Ex. 20, Att. A, p. 3.) In addition, given WKWD s large banked groundwater supply and the flexibility to buy water from other sources, these new projects should not adversely effect the WKWD s water supply.¹³⁴ (Ex. 19A, Part II, p. 14.)

COMMISSION DISCUSSION

The evidence of record establishes that the Elk Hills Power Project s water supply requirements will not adversely affect WKWD s ability to supply existing customers, or likely curtail its ability to meet future demands considering WKWD's:

- entitlement to SWP water;
- banked groundwater; and
- its ability to buy interruptible water.

Furthermore, we do not believe that the use of banked groundwater will create any significant adverse impacts which would be avoided by an application of dry or wet/dry cooling.

We are not persuaded, moreover, that SWRCBR 75-58 has any application to this case, other than as non-binding policy guidance. Although it applies to waste discharges, that prong of SWRCBR 75-58 is not at issue before us. The

¹³⁴ Mr. Patrick also testified that recharge by the Kern Water Bank over the last two years has increased groundwater resources in the area by approximately 500,000 acre-feet. (Ex. 20, Att. A, p. 2.) In the WKWD Groundwater Management Plan it states that [t]he recent recharge efforts of the Bank have resulted in a significant rise in water levels. What is unknown at this point, however, is the potential impact on the [WKWD] wellfield during the Bank s extraction cycles, particularly since these cycles will coincide with periods of heavy demand on the [WKWD s] supplies. (Ex. 18, p. 19.)

controversy engendered by the parties here instead concerns Applicant's proposed use of WKWD groundwater, which may be potable.

The Committee invited a SWRCB representative to our May 2, 2000, hearing, which was specifically scheduled to discuss SWRCBR 75-58's application to the proposed project. Ms. Sheila Vassey, a SWRCB staff attorney appeared but could offer no definitive interpretation of SWRCBR 75-58's application to siting cases. (5/2 RT 31:17-41:6.)

On cross-examination by CURE on whether the SWRCB had jurisdiction to determine whether a water use is beneficial or unreasonable, Ms. Vassey stated that:

The State Board has statutory authority to investigate whether a use of water is —is a waste or unreasonable use of water. In general. (5/2 RT 38:4-25.)

Thus, although SWRCBR 75-58 has long been with us, its application remains somewhat of a mystery. Ms. Vassey, a senior 20-year employee with the SWRCB, could not recall a single instance of its definitive application to a siting case or otherwise.

It is fully apparent to us that the SWRCB had CEQA and the Energy Commission in mind when it framed SWRCBR 75-58. For example, in its introduction, SWRCBR 75-58 references section 25216.3 of the Warren-Alquist Act, which states:

(a) The commission shall compile relevant local, regional, state, and federal land use, public safety, environmental, and other standards to be met in designing, siting, and operating facilities in the state; except as provided in subdivision (d) of Section 25402, adopt standards, except for air and **water quality**, to be met in

designing or operating facilities to safeguard public health and safety, which may be different from or more stringent than those adopted by local, regional, or other state agencies, or by any federal agency if permitted by federal law... . (Pub. Resources Code,/25216.3.)

Furthermore, section 25523 requires our decision to contain:

Findings, regarding the conformity of the proposed site and related facilities with standards adopted by the commission pursuant to Section 25216.3 and subdivision (d) of Section 25402, with public safety standards and the **applicable air and water quality standards and with other relevant local, regional, state, and federal standards ordinances, or laws.** (Pub. Resources Code,/ 25523; emphasis. applied.)

These sections do not place the authority of the Board at issue, nor do they suggest that state agencies work in other than a complementary manner. Rather, the sole pertinent question is the applicability/effect of SWRCBR 75-58 to this case. Preliminarily, we note the broad definition given to the terms Inland Water and Fresh Inland Waters. They are defined, respectively, under SWRCBR 75-58 as:

Inland Water — all waters within the territorial limits of California exclusive of the waters of the Pacific Ocean outside of enclosed bays, estuaries, and coastal lagoons.

Fresh Inland Waters - those inland waters which are suitable for use as a source of domestic, municipal, or agricultural water supply and which provide habitat for fish and wildlife.

The proposed project will use groundwater, which does not fall within SWRCBR 75-58 s definition of fresh inland water. The fact that Applicant will use groundwater is not in dispute.

Staff states that:

Staff looked at the potential for the proposed project to adversely affect the West Kern Water District, in terms of the potential water supply. The project anticipates using about 3100 acre/feet of water per year. As indicated in the Applicant's testimony, this is **groundwater**.

The project supply would be from **groundwater**. The district, given their entitlement to State Water Project water and their extensive **groundwater** bank, over 230,000 acre/feet, there should be no adverse effects on the--the district to supply the project. (3/9 RT 1848:18-185:10, emp. applied.)

CURE states that:

The project would use 3,180 acre feet per year (AFY) of **groundwater** from West Kern District (WKWD's) well field in the Tupman area. (CURE's Reply Brief on Phase II issues, p. 6 (with internal footnotes omitted))

None of the parties has argued for SWRCBR 75-58's application to groundwater. Indeed, the parties simply seem to have assumed the policy's application without a thorough reading of SWRCBR 75-58's express terms. We are not inclined nor do we have the authority to extend the reach of SWRCBR 75-58.

Under CURE's analysis, the Energy Commission would be entitled to act as the SWRCB would act to determine the relative merits of state water policy. We reject that approach.

Instead, under the relevant law as we see it, we are left to apply the general guidance provided by the SWRCB policies to the best of our ability. As we have said, we will not expand SWRCB policies beyond their obvious implications. Therefore, we would agree with Applicant and Staff that since there is no new water allocation involved for the proposed project, we would have no occasion to apply SWRCBR 75-58 for other than general guidance.

This, however, does not conclude our analysis because our review of the relevant statutes reveals a common thread. The use of potable domestic water in California is disfavored. In some instances there must be an economic

feasibility or cost analysis performed before potable domestic water may be used for power plant cooling. The question of what constitutes reasonable costs is, of course, best suited to the factfinder.

We find, however, that neither produced water or Tulare Formation water meet the standards set by the mandatory reuse provisions of the Water Code. We reach this conclusion by assuming, without deciding, that WKWD groundwater is potable domestic water within the meaning of the mandatory reuse provisions.

The mandatory reuse provisions disfavor the use of potable domestic water for power plant cooling if recycled water :

1. is available;
2. of adequate quality; and
3. may be provided at a reasonable cost (comparable to or less than the cost of supplying potable domestic water.

Taken together the entire record--the supplemental testimony and briefs filed by Applicant and Staff, together with previous evidence in our record--demonstrates that none of the foregoing standards may be met. (10/26 RT 19:17-59:7; Exs. 19¹³⁵; 46 & Att. B;¹³⁶ 49;¹³⁷ Staff s Brief on PMPD water issues; Applicant s Brief concerning applicability and requirements of Water Code sections 13550, 13551, 13552.6 and 13552.8. In short, we find that there is no recycled source of water supply, which would trigger application of the mandatory reuse provisions to Applicant. Accordingly, these provisions do not operate to preclude use of WKWD water as Applicant has proposed.

¹³⁵ Supplemental testimony of Joseph O Hagan on Water Resources. (Ex.19.)

¹³⁶ Testimony of Mr. Joseph H. Rowley regarding use of recycled water with attachments. (Ex. 46.)

¹³⁷ Testimony of Peter M. MacLaggan concerning applicability and requirements of Water Code //13550, 13551, 13552.6 and 13552.8. (Ex. 49.)

FINDINGS AND CONCLUSIONS

Based upon the evidence of record before us, we find and conclude as follows:

1. Soils in the project area are susceptible to wind and water erosion.
2. Applicant shall provide a final Streambed Alteration Agreement (SAA) from the California Department of Fish and Game, and a section 401 Water Quality Certification waiver from the Central Valley Regional Water Quality Control Board (CVRWQCB) prior to the beginning of project construction.
3. Applicant has provided a draft Erosion Control and Stormwater Management Plan that will serve as the Stormwater pollution prevention plan as required under the General Construction Stormwater Permit issued by the State Water Resources Control Board.
4. The Conditions of Certification below, in conjunction with the SAA and the CVRWQCB 401-certification waiver, will ensure that soil and water erosion does not create significant adverse environmental impacts.
5. The Elk Hills Power Project will use WKWD groundwater and wet cooling technology in the operation of the powerplant.
6. SWRCBR 75-58 does not prevent the use of water as proposed to supply the Elk Hills project.
7. The WKWD has sufficient water to meet project needs.
8. The use of wet cooling will not cause, or contribute to, any significant adverse environmental impact.
9. Wet cooling will result in more water usage than would dry or wet/dry cooling.
10. There are alternate cooling methods available such as the use of dry or wet/dry cooling technology, which are technically feasible.
11. The use of dry or wet/dry cooling would increase project costs two to three times higher than the costs of wet cooling, and decrease project efficiency.
12. The use of dry or wet/dry cooling would not substantially eliminate or reduce any significant environmental impact caused by the project.

13. There is an alternate, available source of water in the Tulare Formation for the proposed project s cooling requirements.
14. Neither produced water nor Tulare Formation water meets the criteria of availability, suitable quality, and comparable or less cost as required by the Water Code s mandatory reuse provisions. No other sources of recycled water have been identified.
15. The Water Code s mandatory reuse provisions, specifically sections 13550, 13551, 13552.6 and 13552.8 do not prohibit the use of WKWD groundwater for power plant cooling even if it is deemed to be potable domestic water within the meaning of these provisions.

CONDITIONS OF CERTIFICATION

SOILS&WATER 1: Prior to beginning any clearing, grading or excavation activities associated with project construction, the project owner will develop and implement a Storm Water Pollution Prevention Plan (SWPPP) as required under the General Stormwater Construction Activity Permit.

Verification: Thirty (30) days prior to the start of any clearing, grading or excavation activities, the project owner will submit a copy of the Storm Water Pollution Prevention Plan (SWPPP) to the Energy Commission Compliance Project Manager (CPM) for review and approval.

SOILS&WATER 2: Prior to beginning any clearing, grading or excavation activities associated with project construction, the project owner shall submit an erosion control and revegetation plan for staff approval. The final plan shall contain all the elements of the draft plan with changes made to address the final design of the project.

Verification: The erosion control and revegetation plan shall be submitted to the Energy Commission CPM for approval thirty (30) days prior to the initiation of any clearing, grading or excavation activities.

SOIL&WATER 3: Thirty (30) days prior to commercial operation, the project owner, as required under the General Industrial Activity Storm Water Permit, the project owner will develop and implement a Storm Water Pollution Prevention Plan (SWPPP).

Verification: Two (2) weeks prior to the start of commercial operation, the project owner will submit a copy of the Storm Water Pollution Prevention Plan (SWPPP) to the Energy Commission CPM prepared under requirements of the General Industrial Activity Storm Water Permit.

SOIL&WATER-4: The Project shall employ water conservation measures to limit water use to a maximum of 3,000 acre-feet per year.

Verification: The project owner shall summarize the water use of the project during the previous year in the Annual Compliance Report. Records substantiating such use shall be provided to the CPM within ten (10) days of a request by the CPM.

SOIL&WATER-5: The Project shall fund the acquisition of water or water rights for the purpose of water conservation or environmental enhancement. Such funding shall result in at least 1000 acre feet per year of water conservation or environmental enhancement over the life of the Project, except that such funding shall total no more than an annual payment of \$100,000 with 3.5 percent per year added thereafter. The first payment shall be made when commercial operation begins, and a payment shall be made each year thereafter for the life of the Project. The measure(s) will be selected by mutual agreement of the Developer and CURE. Examples of such measures include, but are not limited to, the following:

- a. Contribution to the CalFed Environmental Water account, which is the option preferred by the Parties;
- b. Acquisition of water from Berenda Mesa Water District that could be applied to environmental enhancement purposes in the Delta or otherwise managed to promote water conservation.

Verification: Within sixty (60) days after commercial operation of the project and thereafter in the Annual Compliance Report, the project owner shall submit evidence of payment as required by the above condition for water conservation or environmental enhancement to the CalFed Water Account, or to such other recipient as may be mutually agreed upon by the project owner and California Unions for Reliable Energy (CURE). Project owner shall also provide a letter from CURE identifying the mutually agreed upon recipient.

E. WASTE MANAGEMENT

The project will generate hazardous and nonhazardous wastes during construction and operation. This topic reviews Applicant's waste management plans to reduce the risks and environmental impacts associated with the handling, storing, and disposing of project-related wastes.

Federal and state laws regulate the management of hazardous waste. Hazardous waste generators must obtain EPA identification numbers, and use only permitted treatment, storage, and disposal facilities. Registered hazardous waste transporters must handle the transfer of hazardous waste to disposal facilities. This portion of the Decision assesses whether this will result in any potential environmental impact, and examines whether:

- wastes generated during construction and operation will be managed in an environmentally safe manner;
- disposal of wastes will result in significant adverse impacts to existing waste disposal facilities; and
- waste management practices will comply with all applicable LORS standards. (Ex. 19, p. 77.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Site Excavation

Excavation activities may expose construction workers to hazardous metals or organics in the soil. OEHI, the owner of the site, commissioned a Phase I Environmental Site Assessment (Phase 1)¹³⁸ to determine whether the site had been contaminated by industrial uses. (Ex s. 19, p. 79; 1, p. 5.13-4.)

¹³⁸ At the January 27, 2000, evidentiary hearing, Applicant tendered testimony relating to preparation of the Phase 1, which is Appendix H to the FSA. The parties agreed, however, that the more controversial areas of waste detection were more appropriately addressed under the topic of Worker Safety. (1/27/00 RT 85:14-87:15.)

The Phase 1 covered the 12-acre parcel containing the proposed site. (1/27 RT 98:15-25; Ex. 19, p. 79.)¹³⁹ The Phase 1 was performed in accordance with American Society for Testing and Materials practice E 1527-97, and included the following tasks:

- a review of current and past uses of the property since 1956;
- a site reconnaissance to assess evidence of current and/or past use or storage of toxic or hazardous material; on-site ponds, landfills, drywells, waste streams, or other disposal units; visible soil discoloration; aboveground or underground storage tanks; electrical transformers containing polychlorinated biphenyls; and drums, barrels and other storage containers;
- a visual review of adjacent properties and facilities to assess their potential to adversely impact the site;
- a review of readily available federal and state Environmental Protection Agency lists of known or potential hazardous waste sites or landfills, and sites currently under investigation for environmental violations in the site area;
- contact with county agencies to review available records and permits; and
- a review of environmental data for the oilfield as maintained and supplied by Occidental of Elk Hills, Inc. and the predecessor operating companies for Naval Petroleum Reserve No. 1. (Ex. 19, p. 79.)

The Phase 1 did not find any evidence that the property had ever been used for any purpose other than oilfield related gas storage, and there is no record of well drilling in the property. (Ex. 19, p. 79.) According to the Phase 1, a review of adjacent properties disclosed:

- no hazardous waste sites or discharges, which would affect the proposed site;
- no indications of solid waste disposal on the site;
- no hazardous substances nor unidentified containers were observed on the property;
- no ground staining indicative of hazardous substances was observed, other than minimal staining from hydrocarbons such as from leaking trucks;
- no evidence of any likelihood for any facilities on surrounding properties to have created a current recognized environmental condition at the proposed site; and

¹³⁹ The proposed site is currently occupied by out-of-service tanks and related equipment formerly used for storage and loading of propane, butane, and natural gas liquid products. (Ex. 19, p. 79.) In addition, there are some aboveground pipelines which cross the power plant site. (*Ibid.*)

- there were no other visible indications of any conditions of concern. *(Ibid.)*

Additionally, the Phase 1 reviewed relevant environmental databases and regulatory agency records and did not find any evidence to suggest that any contamination might exist at the site. (Ex. 19, p. 79-80.) Accordingly, the Phase 1 concluded that no on-site or off-site recognized environmental conditions were identified, and that no further investigation is required. *(Ibid.)*

Staff concluded based on results of the Phase I that there is a low probability of significant contamination at the proposed site. (Ex. 19, p. 80.) Nevertheless, Staff found the possibility of unexpected contamination at the project site (discoverable during project construction) to exist that would require further analyses and possible corrective measures. *(Ibid.)* Accordingly, Staff proposed Condition of Certification (**WASTE-4**) which would require a qualified environmental professional to assess the nature and extent of any suspected contamination found during construction.¹⁴⁰

2. Construction

Hazardous wastes in small quantities that may be generated during construction include waste oil and grease, paint, spent solvent, welding materials, contaminated soil, and cleanup materials from spills of hazardous substances. (Exs. 19, p. 80; 1, /5.13.2.3.) These materials will be taken to the construction contractor s hazardous waste storage area and within 90 days transported by a licensed hazardous waste disposal service to a recycling or disposal facility. *(Ibid.)* Initial cleaning of the HRSGs will also generate waste cleaning solutions. (Ex. 19, p. 80.) Washwater effluent will be temporary stored on site in portable tanks and disposed off site by the licensed chemical cleaning contractor. *(Ibid.)*

¹⁴⁰ See our related worker safety discussion and Condition of Certification, **Safety-1**, where we expanded the scope of the duties accorded to the environmental professional.

Hazardous wastes may also be generated if contaminated soils are encountered during demolition or excavations. (Ex. 19, p. 80.) If potentially hazardous soil is found, it will be segregated, sampled, tested and, if found to be hazardous, hauled to a Class 1 landfill or appropriate soil treatment and recycling facility.¹⁴¹ (*Ibid.*; see footnote 3 below.) Moreover, the Kern County Environmental Health Services Department will be notified if underground storage facilities are discovered during construction. (Ex. 19, p. 80.)

The project will generate approximately 600 tons of nonhazardous solid waste during construction of the power plant and linear facilities. (Exs. 19, p. 80; 1, / 5.13.2.1.) Nonhazardous solid wastes will consists of debris, excess concrete, lumber, scrap metal, insulation, packaging, paper, wood, glass, plastic, and empty chemical containers. (*Ibid.*) Nonhazardous waste, which cannot be recycled, will be transported to a Class III landfill. (*Ibid.*)

3. Operation

Hazardous wastes generated during routine project operation include cleaning solutions, spent air pollution control catalyst, used lubricating oil, sandblast media, used cleaning solvents, waste paint and thinner, natural gas filters, lead-acid batteries, contaminated cleanup materials, and empty chemical containers.¹⁴² (Ex. 19, p. 81.)

Selective catalytic reduction catalysts used for NO_x emissions control must be replaced as they becomes contaminated, typically after several years of service. (*Ibid.*) Classified as hazardous due to heavy metals content, Applicant estimates

¹⁴¹ According to Applicant, a balanced cut and fill grading plan is planned for the plant site. (Ex. 1, / 5.13.2.1.) Approximately 60,000 cubic yards of material will be excavated and compacted to accomplish final grade. (*Ibid.*) If petroleum hydrocarbon-impacted soil is encountered but is classified as nonhazardous under appropriate LORS, it may be disposed of at an offsite soil treatment, or recycling or disposal facility. (*Ibid.*)

¹⁴² Used containers of hazardous substances, such as chemical containers or oil filters may be classified as hazardous wastes. (Ex. 19, p. 81.) If managed according to certain regulatory guidelines, however, these containers may be managed as nonhazardous. (Cal. Code of Regs., tit. 22, / 66261.7, 66266.130.)

that about 70,000 pounds of spent catalyst will be returned to the manufacturer for reclamation or disposal every three to five years. (*Ibid.*) About 1,300 gallons of used crankcase and hydraulic oil will be generated annually and will be recycled by a licensed oil recycler. (*Ibid.*) Oily rags and oil absorbent, used to contain small spills, will be collected near the point of generation and disposed of off site in a hazardous waste landfill, although the rags may be sent to an industrial cleaning service. (*Ibid.*)

Nonhazardous wastes generated during operation would be minor and include trash, office wastes, empty containers, broken or used parts, used packing material and filters, spent demineralizer resin, and cooling tower basin sludge. (Ex. 19, p. 81.) Waste such as paper, cans, and plastic will be placed in a covered dumpster, recycled to the extent possible, and the remainder disposed on a regular basis at a Class III landfill. (*Ibid.*) Applicant estimates that approximately 100 tons of solid waste will be generated on an annual basis. (*Ibid.*)

4. Wastewater¹⁴³

During construction, wastewater generated at the construction sites will include sanitary wastes, and may include stormwater runoff and equipment washwater. (Ex. 1, / 5.13.2.2) Construction-related sanitary wastes will be collected in portable chemical toilets, later pumped and transported by licensed contractors to a wastewater treatment facility. (*Ibid.*) Stormwater runoff will be managed by implementing Best Management Practices (BMP) in accordance with state and local regulatory requirements and the storm-water construction permit requirements applicable to the project. (*Ibid.*) Equipment washwater will be collected and contained in specially designated areas and will be disposed of via

¹⁴³Rather than under the Geology topic, the parties agreed that the discussion pertinent to injection wells would be analyzed, under the "Soil and Water Resources" portion of this Decision, *ante.* (1/20 RT 4:22-5:3.)

a licensed vacuum truck-hauler to a wastewater treatment facility for appropriate treatment. (*Ibid.*)

During operation, a process wastewater collection system will provide for the collection, treatment, and disposal of wastewater produced from the combined project equipment and facilities. (Ex. 1, / 5.13.2.2.) Plant and equipment drains in areas potentially contaminated by oil or chemicals will be contained and routed through an oil water separator prior to discharge. (*Ibid.*) Sanitary wastewater will be collected by a separate sanitary waste system and routed to a septic tank and leachfield. (*Ibid.*)

Process wastewater will consist of blowdown from the main cooling tower, evaporative cooler, and HRSG units. (Ex. 1, / 5.13.2.2.) Cooling tower blowdown is the single largest wastewater source and is expected to average approximately 430,000 gallons per day (gpd). (*Ibid.*) Approximately 58,000 gpd from floor drainage will be routed to a central wastewater collection plant. (*Ibid.*) Wastewater from oily floor drains and oily storm runoff will be processed in an isolated system and passed through an oil-water separator prior to disposal. (*Ibid.*) Another 15,000 gpd of demineralizer wastewater will be generated and pumped to the wastewater collection plant. (*Ibid.*)

Process wastewater will be temporarily stored in a cooling tower washwater drain tank and a HRSG blowdown tank located at the plant site.¹⁴⁴ (Ex. 1, / 5.13.2.2) The wastewater will then be pumped to an underground injection field located four miles south of the plant site. (*Ibid.*; see note 5, *ante.*) The average process wastewater generation rate, which will require disposal, is expected to be 503,000 gpd (approximately 349 gallons per minute).¹⁴⁵

¹⁴⁴ As a water conservation measure, Applicant proposes that approximately 36,000 gpd of high quality blowdown water from the HRSG cooling system will be reused as make-up water for the cooling tower.

¹⁴⁵ Converted to acre-feet, our calculation produces a conversion of Applicant s 503 gpd to 1.54 acre-feet per day.

5. Potential Impacts on Waste Disposal Facilities

The quantities of nonhazardous materials generated during construction and operation are insignificant relative to landfill disposal capacity that now exists in California. (Ex. 19, p. 81.) Hazardous waste is accepted at three Class I landfills in California, all of which have more than enough capacity to receive the project's hazardous waste that is not recycled.¹⁴⁶ (*Ibid.*)

Non-recyclable, nonhazardous waste will be disposed of at one of five Class III landfills owned and operated by the Kern County Waste Management Department. (Ex. 19, p. 81.) Cumulatively, the landfills have remaining disposal capacities totaling over 500,000 tons annually, and a remaining capacity of almost eleven million tons. (*Ibid.*) Staff concluded that the amount of wastes generated during project construction (and operation) is insignificant relative to disposal capacity that now exists, and would not meaningfully impact landfill operations. (*Ibid.*)

6. Cumulative Impacts

Staff's assessment of cumulative impacts included wastes generated by the licensed La Paloma project, and the proposed Sunrise and Midway-Sunset projects, in addition to Elk Hills. (Ex. 19, p. 82.) Staff found that combined cycle projects similar to these do not generate significant amounts of either hazardous or nonhazardous wastes, and much of what is generated will be recycled. (*Ibid.*) Discounting the effects of recycling, construction wastes are estimated to be less than 2,500 tons (total) and operational wastes less than 6,000 tons (annually). (*Ibid.*) These figures may be compared to a total annual capacity of over

¹⁴⁶ The three Class I hazardous waste facilities in California are (1) Chemical Waste Management's Kettleman Hills Facility (Kings County), (2) Safety-Kleen Environmental Service's facilities in Buttonwillow (Kern County), and (3) Westmoreland (Imperial County). (Ex. 1, p. 5.13-

500,000 tons for Kern County landfills. (*Ibid.*) Thus, due to the minor amounts of wastes generated during project construction and operation and the availability of regional landfills, cumulative impacts will be insignificant for both hazardous and nonhazardous wastes. (*Ibid.*)

COMMISSION DISCUSSION

The evidence was uncontroverted that hazardous wastes generated by the project will be managed in accordance with applicable LORS. Applicant has indicated that to the extent possible recyclable hazardous and nonhazardous wastes would be recycled. If petroleum hydrocarbon-impacted soil is encountered but is classified as nonhazardous under appropriate LORS, it may be disposed of at an offsite soil treatment, or recycling or disposal facility. (*Ibid.*) In view of our determination that an environmental professional shall be present on-site, we believe that appropriate safeguards are present to ensure that appropriate decisions are made with regard to the handling and disposal of any contaminated soils discovered during construction. (See Worker Safety Condition **SAFETY-1**.)

Accordingly, we find that the amount of waste generated by the project will have no significant impact on the available disposal facilities and landfills. We therefore determine that the construction and operation of the project will not result in any significant adverse impacts if the Elk Hills Power Project implements the following Conditions of Certification.

FINDINGS AND CONCLUSIONS

3.) These have a total remaining capacity of over 20 million cubic yards, with anticipated remaining lifetimes of up to 90 years. (*Ibid.*)

Based on the uncontroverted evidence of record, the Commission makes the following findings and conclusions:

1. The project will generate hazardous and non-hazardous wastes during construction and operation.
2. Excavation activities may expose construction workers to hazardous metals or organics in the soil.
3. Potentially hazardous soils will be subject to testing and disposal in accordance with the determinations made by an on-site environmental professional as set forth in the Worker Safety Conditions of this Decision.
4. Under Applicant's waste management plan, the project will recycle hazardous and nonhazardous wastes to the extent possible and in compliance with applicable LORS.
5. Hazardous wastes that cannot be recycled will be transported by registered hazardous waste transporters to one of the three California Class I landfills.
6. Nonhazardous wastes that cannot be recycled will be disposed at nearby Class III landfills.
7. The Elk Hills Power Project, either alone or in combination with the four other potential power plant projects in the same area, will not create quantities of hazardous or nonhazardous construction or operational wastes sufficient to create a significant adverse impact upon available Class I or Class III landfills.
8. Applicant's stormwater management plan will control stormwater runoff in conformance with applicable LORS.
9. Due to the availability of hazardous and nonhazardous waste disposal facilities, and the relatively inconsequential amount of waste generated by the project, potential impacts to existing facilities will be insignificant.
10. With implementation of the Conditions of Certification listed below, the project will conform with all applicable LORS relating to waste management as identified in the pertinent portions of APPENDIX A of this Decision.

We therefore conclude that the disposal of hazardous and/or non-hazardous wastes generated by construction and operation of the Elk Hills project will not create any significant adverse direct, indirect, or cumulative impacts.

CONDITIONS OF CERTIFICATION

WASTE-1 The project owner shall obtain a hazardous waste generator identification number from the Department of Toxic Substances Control prior to generating any hazardous waste.

Verification: The project owner shall keep its copy of the identification number on file at the project site and notify the CPM via the monthly compliance report of its receipt.

WASTE-2 Upon becoming aware of any impending enforcement action, which may compromise the proper management of project related wastes, the project owner shall notify the CPM of any such action taken or proposed to be taken against it, or against any waste hauler, or disposal facility, or treatment operator with which the owner contracts.

Verification: The project owner shall notify the CPM in writing within ten (10) days of becoming aware of an impending enforcement action.

WASTE-3 Prior to the start of both construction and operation, the project owner shall prepare and submit to the CPM, for review and comment, a waste management plan for all wastes generated during construction and operation of the facility, respectively. The plans shall contain, at a minimum, the following:

- a description of all waste streams, including projections of frequency, amounts generated and hazard classifications,
- methods of managing each waste, including treatment methods and companies contracted with for 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 less than sixty (60) days prior to the start of construction, the project owner shall submit the construction waste management plan to the CPM for review. The operation waste management plan shall be submitted no less than 60 days prior to the start of project operation. The project owner shall submit any required revisions within thirty (30) days of notification by the CPM (or mutually agreed upon date). In the Annual

Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to planned management methods.

WASTE-4 The project owner shall have an environmental professional (as defined by American Society for Testing and Materials practice E 1527-97 Standard Practice for Phase I Environmental Site Assessments) available on site during soil excavation activities. If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, or other signs, prior to any further construction activity at that location, the environmental professional shall:

- inspect the site, determine the need for sampling to confirm the nature and extent of contamination,
- file a written report to the project owner stating the recommended course of action.

If, in the opinion of the environmental professional, significant remediation may be required, the project owner shall contact representatives of the:

- Kern County Environmental Health Services Department, and
- the Sacramento Field Office of the California Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall notify the CPM in writing within five (5) days of any reports filed by the environmental professional, and indicate if any substantive issues have been raised.

VIII. LOCAL IMPACT ASSESSMENT

All aspects of a power plant project effect, in differing degrees, the community in which it is located. The effect of the various elements of a project upon the local area varies from case to case depending upon the nature and the extent of the community and of the associated impacts. In the present instance, we believe the technical elements discussed in this portion of our Decision are those constituting the most likely areas of potential local concern.

A. LAND USE

The discussion of land use impacts for the Elk Hills Power Project focuses on two main issues:

- the proposed project s plan to conform with local land use plans, ordinances, and policies; and
- its potential to have direct, indirect, and cumulative conflicts with existing and planned uses.

In general, a power plant project can be incompatible with existing or planned land uses when it creates unmitigated noise, dust, public health hazards or nuisances, traffic, or visual impacts, or when it significantly restricts existing or future uses.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The proposed Elk Hills Power Project will be located at the approximate center of the administrative boundaries of the Elk Hills Oil and Gas Field, at the intersection of Elk Hills Road and Skyline Road, in western Kern County. (1/25 RT 16:25-19:10; Exs. 19, p. 97; 1, p. 5.7-1.) With the exception of Elk Hills Road, the entire 74 square mile Elk Hills Oil and Gas Field is closed to public access. (*Ibid.*) The site is characterized by sparse vegetation, out of service tanks and related equipment formerly used for storage and loading of propane, butane, and natural gas products. (*Ibid.*) The power plant s construction activities, while

disturbing 12 acres, will be temporary and will be conducted with minimal interference with the surrounding oil and gas land use. (1/25 RT 19:1-4; Ex. 1, p. 5.7-12.)

Land Use

There are no residences, parks, recreational, educational, religious, health-care facilities or commercial uses, on the project site or within a five-mile radius of the site.¹⁴⁷ (Ex. 19, pp. 97-98.)

The following tables indicate Kern County s land use designations, existing land uses of the proposed project and transmission, water, and gas line corridors, and zoning designations within the affected land use designations.

Summarized below are the existing Kern County General Plan land use designations:

LAND USE Table 1

LOCATION OR LINEAR FACILITY	Land Use Designation
Elk Hills Power Project	Mineral and Petroleum
Transmission Line Route 1A	Mineral and Petroleum/Special Treatment Areas/Mineral and Petroleum-Flood Hazard
Transmission Line Route 1B and 1B Variation	Mineral and Petroleum/Extensive Agricultural/Intensive Agricultural
Water Supply Line Route 2	Mineral and Petroleum/Non-Jurisdictional Land/Extensive Agricultural/ Mineral and Petroleum-Flood Hazard/Public Facilities-Flood Hazard
Wastewater Supply Line Route 3	Mineral and Petroleum
Natural Gas Supply Line Route 4	Extensive Agricultural/Mineral and Petroleum

Source: (Ex. 19, p. 89; 1/25 RT 22:2-26:14.)

The project site is designated Mineral and Petroleum, and the project is a compatible use with the existing land use designation. (1/25 RT 19:4-6, 22:2-

¹⁴⁷ The nearest residence is about 5.1 miles away from the proposed project. (1/25 RT 19:7-10.)

23:2; Tables 1, & 2 below.) The existing land uses for the facility are represented in LAND USE Table 2.

**LAND USE Table 2
Existing Land Uses**

LOCATION OR LINEAR FACILITY	EXISTING LAND USES
Elk Hills Power Project	Oil and Gas Production
Transmission Line Route 1A	Oil and Gas Production/Undeveloped/School/Church/Residential
Transmission Line Route 1B and 1B Variation	Commercial/Oil and Gas Production/Conservation/Undeveloped/Agricultural/Rural Residences
Water Supply Line Route 2	Oil and Gas Production/Undeveloped/West Kern Water District Distribution Center
Wastewater Supply Line Route 3	Oil and Gas Production
Natural Gas Supply Line Route 4	Oil and Gas Production

Source: (Ex. 19, p. 89.)

The Kern County zoning designations affected by Elk Hills are as follows:

LAND USE Table 3

Zoning Designations Within The Affected Environment

LOCATION OR LINEAR FACILITY	ZONING DESIGNATIONS
Elk Hills Power Project	Location or Linear Facility
Transmission Line Route 1A	Limited Agriculture (A-1), Limited Agriculture (A-1), Estate (E-20, E-10), Low Density Residential Mobile Home (R1-M H), General Commercial (C-2)
Transmission Line Route 1B and 1B Variation	Limited Agriculture (A-1), Exclusive Agriculture (A), Airport Approach Height Combining (H)
Water Supply Line Route 2	Limited Agriculture (A-1), Exclusive Agriculture (A)
Wastewater Supply Line Route 3	Limited Agriculture (A-1), Exclusive Agriculture (A)
Natural Gas Supply Line Route 4	Limited Agriculture (A-1)

Source: (Ex. 19, p. 97.)

Each of the foregoing zoning designations allows the power plant and its appurtenant facilities as permissible uses. (Ex. 19, p. 98.) The site is zoned A-1 (Limited Agriculture), and power plants are a conditional use in this zone. (*Ibid.*)

While the County would normally require a conditional use permit for this type of project, the Commission's certification supersedes this requirement.¹⁴⁸ (Ex. 19, p. 102.) In order to address County concerns, however, we have included as a Condition of Certification (**LAND-1**) the submission of a development plan by Applicant that will include measures, which would be otherwise imposed by the County. (1/25/00 RT 22:22-23:18; Ex. 19, pp. 102-04.)

Applicant proposes to lease a 12-acre portion of a 640-acre parcel from Occidental. (1/25 RT 23:19-26:10; Ex. 19, p. 98.) As such, the Subdivision Map Act applies to the project, and requires Applicant to file with Kern County an application for a lot line adjustment, which is a Categorical Exemption under CEQA. (*Ibid.*) The testimony of record established that Kern County will review Applicant's lot line adjustment application after the Occidental lease is recorded in January 2000. (*Ibid.*) The evidence of record suggests that Kern County's action on the application will be purely a ministerial formality.¹⁴⁹ (1/25 RT 25:6-26:7.) Because, however, the record does not demonstrate compliance, we have included a Condition requiring the Applicant to provide proof of compliance with the Subdivision Map Act. (Condition of Certification **LAND-1**.)

¹⁴⁸ Staff has required Applicant to comply with the relevant provisions of the Kern County Zoning Ordinance. (Ex. 19, p. 100; see Condition **LAND-1**.)

¹⁴⁹ As with CEQA, a lot line adjustment is a Categorical Exemption under the County's rules. (1/25 RT 25:6-26:7.)

Linear Facilities

Transmission lines are permitted by right in all zones and require no discretionary permits from the county under the Kern County Zoning Ordinance. (Ex. 19, p. 99.) Transmission line alternative 1A will not cross agricultural lands as the route is almost entirely within the Elk Hills Oil and Gas field. (*Ibid.*) Route 1A will have no land use impacts on any sensitive land uses identified along the proposed route. (Ex. 1, p. 5.7-14.) Sensitive receptors along the corridor of Route 1A include a school (800 feet), a church, and residences (800-1,200 feet). (Ex. 19, p. 98.)

Transmission line alternatives 1B and the 1B Variation pass through agricultural/residential zoned land, although their routes are slightly different. (Exs. 19, p. 97-98; 1, p. 5.7-11 - 14.) Route 1B is parallel to the existing Midway-Taft 115 kV line that runs between the power plant site and the Midway substation. (*Ibid.*) Route 1B Variation would replace the existing line and transmission structures (lattice towers and steel poles) with steel poles.¹⁵⁰ (Ex. 19, p. 98.)

Alternate Transmission Route 1B passes through an Airport Height Combining District, which seeks to minimize aviation hazards by limiting the height of trees and structures in approach zones around airports. (*Ibid.*) Currently, there are three existing concrete transmission line poles (71 feet in height) and one lattice tower (105 feet in height) in the Airport Approach Height Combining District. (Ex. 19, p. 99.) These would be replaced with four taller concrete poles, between 100 and 130 feet in height. (*Ibid.*) Because the new poles exceed the tallest of the former, Applicant must seek approval from the Federal Aviation Administration (FAA)¹⁵¹ for their replacement under the line 1B Variation. (1/25 RT 24:2-7.) The

¹⁵⁰ Staff considers the Route 1B Variation to be environmentally superior to Route 1B because it would replace existing towers with poles and reduce the number of transmission structures in the landscape. (Ex. 19, p. 100.)

¹⁵¹ Federal Air Regulations, Part 77.

evidence of record demonstrates that Elk Hills received a determination of no hazard to air navigation from the FAA on December 2, 1999. (*Ibid.*)

The last segment of Alternate Transmission Route 1B (about 3.5 miles) is within an existing transmission right-of-way (the undeveloped shoulder of Wasco Way), which is adjacent to agricultural lands and residential properties. (Exs. 19, p. 99; 1, p. 5.7-14.) Most of the residential property is set back from the line more than 100 feet (the nearest residence is approximately 80 feet) so that the line will not interfere with continued use of the residences. (Ex. 19, 144; 1, p. 5.7-14.) The agricultural land is the sole parcel affected by the project and considered Prime, Unique, or Farmland of Statewide Importance as defined by the California Department of Conservation. (Ex. 19, p. 99.) The total number of acres taken out of production due to construction of the route is 0.01 acres, which we do not consider an adverse or significant impact to agriculture use. (Ex. 19, p. 99.)

The evidence of record establishes that the Elk Hills Power Project will not cause a significant change in the character of the affected area. At least three other projects (La Paloma, Sunrise, and Midway Sunset) may also terminate at the existing Midway Substation. At present, however, there is insufficient information to determine whether these potential multiple terminations will affect land uses in the substation's immediate vicinity.

Kern County has no specific provisions regarding the potential closure and restoration of the project site. (Ex. 19, p. 100.) The County has requested that it be given an opportunity to review the closure plan required in the Compliance and Closure portion of this Decision. (*Ibid.*) Accordingly, the county's review is specified in another portion of this Decision. (1/20/00 RT 25:25-27:21; see also Facility Design Condition of Certification **GEN-9**.)

FINDINGS AND CONCLUSIONS

Based upon the uncontroverted evidence of record, we find and conclude as follows:

1. The Elk Hills Power Project and its related facilities are permissible uses under the applicable Kern County zoning designations.
2. Construction and operation of the Elk Hills Power Project will not create conflicts with existing or planned land uses in the project vicinity.
3. No significant or adverse impact will result to agricultural or residential property affected by the Elk Hills Power Project.
4. It would be speculative at this time to determine whether termination of the transmission lines of the Elk Hills, Sunrise, and Midway-Sunset projects will create a cumulatively adverse impact to land uses in the immediate vicinity of the Midway Substation.
5. The Conditions of Certification below ensure that the project will be constructed and operated in compliance with the applicable LORS relating to land use as identified in the pertinent portion of Appendix A of this Decision.

We therefore conclude that the Elk Hills Power Project will not create any significant direct or indirect adverse land use impacts.

CONDITIONS OF CERTIFICATION

LAND-1 Prior to the start of construction, the project owner shall submit a site development plan for the project to Kern County for its review and comment. The site development plan shall also be submitted to the CEC's CPM for review and approval.

The site development plan shall comply with all applicable provisions of Chapters 9.12, 19.86, and 19.82 of the Kern County Zoning Ordinance.

The project owner shall provide a letter of comment from the Kern County Planning Director stating that the project is consistent with

the provisions of the Kern County General Plan and Zoning Ordinance.

The project owner shall submit to the CPM for review and approval a site development plan, including a landscaping plan. The project owner shall submit a letter from the Kern County Planning Director stating that the site development plan conforms to Kern County's Zoning Code and has been approved by the County.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan. The landscaping shall not be planted before the plan is approved. The project owner shall notify the CPM when the landscaping has been planted and is ready for inspection.

Prior to the start of construction, the project owner shall submit to the CPM proof of compliance with the Subdivision Map Act, and Kern County's action thereupon.

Verification: At least 60 days prior to the start of any ground disturbance related to construction, the project owner shall submit to the CPM for review and approval:

- the proposed site development plan and landscape plan;
- a copy of the letter of comment from the Kern County Planning Director; and
- proof of compliance with the Subdivision Map Act, and Kern County's action thereupon.

Within 30 days of notification by the CPM, the project owner shall submit any required revisions.

The project owner shall complete installation of the landscaping by the end of the first planting season following first electricity generation. The project owner shall notify the CPM within 7 days after the landscaping is planted that the landscaping is ready for inspection.

B. NOISE

The construction and operation of any power plant creates noise, or unwanted sound. Several factors combine to determine whether a proposed project will meet applicable noise control laws and ordinances or whether it will create significant adverse impacts. These factors include:

- the character and the loudness of the noise,
- the times of day or night during which it is produced, and
- the proximity of the facility to sensitive receptors.

In this portion of the Decision, we examine the likely noise impacts from the Elk Hills Power Project and the sufficiency of measures proposed to control them.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The Elk Hills Power Project site is near the center of the Elk Hills Oil and Gas Field and is surrounded by oil wells, pipelines, compressors, pumps and tanks. (Ex. 19, p. 139.) The existing ambient noise environment in the project area is very quiet. (Ex. 19, p. 139-40.) A recent noise survey performed within an oilfield near the edge of the town of McKittrick, 8.75 miles to the west, indicates that the hourly L90 background levels range from 34 to 34.5 dBA regardless of location. (*Ibid.*) The very low minimum background level of 34 dBA measured near McKittrick is assumed to be representative throughout the study area for the Elk Hills Power Project. (1/20 RT 63:12-16; Ex. 19, p. 140.)

The Noise Element of the Kern County General Plan establishes the following permissible sound levels:

Kern County General Plan-Noise Element
NOISE: Table 1
Kern County General Plan-Noise Element

Land Use Category	Maximum Permissible Sound Level		
	L ₅₀ (Day)	L ₅₀ (Night)	CNEL
Non-sensitive Land Uses	65	60	75
Moderately Sensitive Land Uses	60	55	70
Sensitive Land Uses	55	45	65
Highly Sensitive Land Uses	50	40	60

Source: (Ex. 19, p. 198.)

Single family rural dwellings are classified as "highly noise sensitive" land uses. (Exs. 1, p. 5.9-1; 20, p. 2.)¹⁵² Isolated farms exist 5.1 miles to the northeast, beyond the California Aqueduct, and the nearest residence is approximately that distance to the northeast of the plant. (1/20 RT 59:12-60:1; 62:25-63:1; Ex. 19, p. 139.) The nearest communities include Valley Acres and Dustin Acres 6 miles to the southeast, Tupman 6.9 miles east, Derby Acres 7.5 miles west-southwest, Buttonwillow 8.3 miles north, and McKittrick 8.75 miles west. (1/20 RT 63:1-5; Ex. 19, p. 139.)

In addition, there are no schools, hospitals or other sensitive receptors within a 2-mile radius of the power plant. (1/20 RT 63:6-11; Ex. 19, p. 139.) Staff identifies the 2-mile radius as an area outside of which construction and operation of the power plant project is not likely to cause noise impacts. (*Ibid.*) The maximum allowable noise level at these receptors is 40 dBA, as specified in the Kern County General Plan. (Ex. 19, p. 140.) By comparison, when operational, the noise levels at the nearest residence will be about 22 decibels, which is well below the Kern County noise standard of 40 dBA, and also less than the 34 decibels measured as ambient noise levels. (1/20 RT 63:64:17.)

¹⁵² See Attachment A to the testimony of Thomas S. Adams.

Construction

Various activities during the project's 16-month construction period will create noise. (1/20 RT 63:12-16, 66:13-67:4; Ex. 19, p.141.) Construction of the power plant can generally be divided into five phases: excavation, concrete pouring, steel erection, mechanical component installation, and cleanup. (Ex. 19, p. 141.) Major noise sources include air compressors, backhoes, graders, bulldozers, scrapers, front-end loaders, cranes, generators, and various vehicles. (Ex. 1, p. 5.9-3.) Typical composite noise levels associated with power plant construction are shown below.

NOISE: Table 3
Construction equipment and composite site noise levels.

Construction Phase	Noise Construction Equipment	Equipment Noise Level (dBA)	Composite Site Noise Level @ 50 ft. (dBA)
Excavation	Pile driver	101	89
	Dump truck	91	
	Rock drill	98	
Concrete pour	Truck	91	78
	Concrete mixer	85	
Steel erection	Derrick crane	88	87
	Jack hammer	88	
Mechanical	Derrick crane	88	87
	Pneumatic tools	86	
Clean-up	Truck	91	89
	Steam blow (unmuffled)	110 @ 1,000'	

Source: (Ex. 19, p. 141.)

The loudest noise associated with the construction of a power plant of this type generally is an activity necessary to purge the steam piping and tubing before operation begins; this is known as a "steam blow". Steam blows can produce noise as loud as 130 dBA at a distance of 1000 feet, attenuated to about 11 dBA, which is inaudible at the nearest residence at 5.1 miles.¹⁵³ (Ex. 19, pp. 142; 1, 5.9-3.)

Project workers will also be subjected to on-site construction noise; as well as noise produced during construction of the water pipelines, the gas supply line, and the transmission line. (1/20 RT 63:25-64:10.) The parties estimate that workers may be exposed to noise levels between 75 and 90 decibels in some construction areas.¹⁵⁴ (1/20 RT 63:25-64:23, Ex. 19, p. 142.) These areas will be marked as high noise areas and hearing protection devices will be required. (1/20 RT 64:24-65-2.) In addition, all employees who may be exposed to noise levels exceeding 85 decibels over an eight-hour period will be included in a hearing conservation program. (1/20 RT 65:2-7.) Finally, our mitigation measures include a requirement for Applicant to implement a noise control program, as a worker protection measure. (Condition of Certification **NOISE 3**.)

Operation

During operations, the Elk Hills Power Project will essentially be a steady, continuous broadband noise source. (Ex. 19, p. 143.) The primary contributors to the project's operational noise include the HRSGs, the CTGs, the STGs, the cooling towers, the boiler feed pumps, the generator step-up transformers, and

¹⁵³ Steam blows are performed daily over the initial start-up period of two or three weeks typically lasting two or three minutes each. Steam blow noise attenuates faster with distance than other construction noise dominated by diesel engines because it is at a higher frequency. (Ex. 19, p. 142.)

¹⁵⁴ The Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted noise regulations, which establish maximum noise levels to which workers at a facility may be exposed. (Ex. 19, p. 137.) OSHA does not consider levels of 85 dBA or less hazardous to employee health. (Ex. 19, p. 142.)

the circulating water pumps. When operating, the power plant noise levels at the nearest residence will be about 22 decibels. (1/20 RT 64:11-17.) This noise level is well below the Kern County noise standard of 40 decibels, and is less than the 34 decibels that were measured as ambient noise levels. (*Ibid.*) The evidence also indicates that the linear facilities will not create any operational noise impacts. (Ex. 19, p. 144.)

For a discussion of cumulative impacts, the general geographic area of influence is defined as an approximately 15-mile radius around the power plant, or within 1 mile of the linear facilities. (Ex. 19, p. 145.) Projects within the area of influence are La Paloma, Sunrise, and Midway Sunset.¹⁵⁵ (Ex. 19, p. 146.) The nearest project to Elk Hills is the La Paloma project, which is about six and a half miles to the west. (1/20 RT 65:9-12; Ex. 19, p. 146.) Due to this distance, the evidence establishes that no cumulative impacts are to be expected from other projects. (1/20 RT 65:8-12.)

Should the project face a closure scenario, operational noise will cease; and any noise caused by dismantling or closure activities will be treated similarly to that caused by the initial construction activities. (Ex. 19, p. 147.)

FINDINGS AND CONCLUSIONS

Based upon the uncontroverted evidence of record, we find and conclude as follows:

1. Construction and operation activities of the Elk Hills Power Project will create noise.
2. The sensitive noise receptors nearest the Elk Hills Power Project are approximately 5.1 miles away.

¹⁵⁵ A fourth project, Pastoria, is more than 15 miles away, and is thus outside the area considered for cumulative impacts. (Ex. 19, p. 146.)

3. Construction activities associated with the project will be temporary in nature.
4. Construction and operational noise from the project is not expected to exceed the Kern County noise standard of 40 dBA since project noise will be attenuated by distance from sensitive noise receptors.
5. Construction and operational noise from the power plant will not increase the existing ambient noise levels experienced at the nearest sensitive receptors nor result in any significant adverse impacts to the environment or public health.
6. Power plants do not exist, nor are any planned, within a six-mile radius of the Elk Hills Power Project.
7. The Applicant will implement a noise control program to ensure that construction workers and plant employees will be protected from exposure to high noise levels during construction and operation.
8. Implementation of the measures contained in the Conditions of Certification below will assure that the Elk Hills Power Project will comply with applicable LORS related to noise as specified in the pertinent portion of Appendix A of this Decision.

We therefore conclude that the Elk Hills Power Project will not create any significant direct, indirect, or cumulative adverse noise impacts.

CONDITIONS OF CERTIFICATION

NOISE-1 Prior to the start of rough grading, 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 EHPP. If the telephone is not staffed 24 hours per 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 also be posted at the EHPP site during construction in a manner visible to passersby. This telephone number shall be maintained until the EHPP has been operational for at least one (1) year.

Verification: The project owner shall transmit to the Compliance Project Manager (CPM) in the first monthly construction report following the start of

rough grading, a statement signed by the project manager attesting that the telephone number has been established and posted at the site.

NOISE-2 Throughout the construction and operation of the EHPP, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints.

Protocol: The project owner shall:

1. use the Noise Complaint Resolution Form (see below for an example), or functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
2. attempt to contact the person(s) making the noise complaint within 24 hours;
3. conduct an investigation to determine the source of noise related to the complaint;
4. take all feasible measures to reduce the noise at its source if the noise is project related, and
5. submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including results of noise reduction efforts; and if obtainable, a signed statement by the complainant, stating that the noise problem is resolved to complainant's satisfaction.

Verification: Within 30 days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with Kern County and with the CPM documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 30-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is finally implemented.

NOISE-3 Prior to the start of rough grading, the project owner shall submit to the CPM for review a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and, also, to comply with applicable OSHA standards.

Verification: At least 30 days prior to the start of rough grading, the project owner shall submit to the CPM the above referenced program. The project owner shall make the program available to OSHA upon OSHA's request.

NOISE-4 The noise mitigation measures to be employed by the project owner may include (but not be limited to):

1. Provide standard outdoor/weather enclosures for the CTG packages.
2. Provide air inlet silencers for the combustion turbines.

Verification: Within 30 days of completing the design of the noise mitigation measures, the project owner shall transmit the noise mitigation measures to the EHPP and the CPM.

NOISE-5 The project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted within 30 days after the facility is operating at an output of 80% of rated capacity or greater, by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5100 (Article 105) and Title 29, Code of Federal Regulations, Part 1910.

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 that will be employed to comply with the applicable state 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 upon OSHA's request.

NOISE-6 Noisy construction work (that which causes off-site annoyance, as evidenced by the filing of a legitimate noise complaint) shall be restricted to the hours of 7 a.m. to 7 p.m. on weekdays and from 8 a.m. to 6 p.m. on weekends and holidays.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement certifying that the above restrictions will be observed throughout the construction of the project.

NOISE COMPLAINT RESOLUTION FORM

Elk Hills Power Project (99-AFC-1)		
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 3 feet from noise source _____ dBA	Date: _____	
Initial noise levels at complainant's property: _____ dBA	Date: _____	
Final noise levels at 3 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).

C. SOCIOECONOMICS

Under this topic, we evaluate any direct, indirect, or cumulative impacts the project may cause to local public services or infrastructure, and, we examine any relevant community issues.

SUMMARY AND DISCUSSION OF THE EVIDENCE

Direct Effects

During project construction, the number of workers will range from approximately 111 to 195 in the first four months of construction, to approximately 124 workers in the 15th month.¹⁵⁶ (Ex. 19, p. 269, Table 1.) Peak construction activity will occur in the 8th month; when the greatest number of workers (about 352) will be needed. (Exs. 19, p. 265; 1, 5.8-13.)

The construction workforce, for the most part, is expected to be drawn from Bakersfield and surrounding communities. (Ex. 1, p. 5.8-10.) The workforce will consist of electricians, pipefitters, boilermakers, bricklayers, iron and sheet metal workers, and members of other crafts and trades necessary to construct, operate, and maintain the project. (Ex. 1, Table 5.8-11.) Overall, when secondary jobs are included, the Elk Hills Power Project will create the equivalent of 785 construction-related jobs, and 58 operations-related jobs. (Ex. 19, p. 265.)

Construction will cause a temporary influx of workers over about a 15-month period. (Exs. 19, pp. 264-65; 1, p. 5.8-10.) The average number of non-local workers needed for power plant construction will be 48. (Exs. 19, p. 265; 1, Table 5.8-13.) Eight of the 20 workers needed to maintain and operate the project may also be from outside the local area. (*ibid.*)

¹⁵⁶ Project construction includes facilities related to power generation, electric power transmission, and fuel, water supply and wastewater pipelines. (Ex. 19, p. 265.)

Sufficient housing is available in the project area to readily accommodate workers. (Ex. 19, p. 265-66.) Local medical, police, and emergency services are also adequate to absorb any additional demands caused by the project. (Ex. 19, p. 266.) While local school enrollment in the immediate vicinity of the project is below enrollment capacity, schools in the broader project area,¹⁵⁷ including Bakersfield, are generally at or over capacity. (Exs. 19, p. 266; 1, p. 5.8-5 — 5.8-7.)

Children of workers moving into this broader area will thus exacerbate any existing overcrowding and potentially result in increased costs to the schools. (Exs. 19, p. 266; 1, p. 5.8-5 — 5.8-7.) Up to 44 school-age children of construction personnel could be added to the general area's schools. (Exs. 19, p. 266; 21.) Another seven school-aged children of operation personnel may enter schools in the immediate project vicinity. (*Ibid.*) Of the total 51 school-age children likely to impact the project area, 70 percent will be going to Bakersfield district schools. (*Ibid.*)

Additional funding to offset the above direct impacts to the region's educational facilities is not available and mitigation of potential impact to schools at or above capacity beyond that contained in the Conditions of Certification is not feasible. (1/20/00 RT 56:4-5.)¹⁵⁸ Under state law, school funding is restricted to property taxes and statutory facility fees collected at the time the building permit is issued. (Ex. 19, p. 146.) The impact on local schools will be small as the project will contribute nearly \$20 million in property taxes, with about \$8,576,260 allocated to

¹⁵⁷ The area of potential impact, or project area, for socioeconomics includes eight communities (Bakersfield, Buttonwillow, Maricopa, McFarland, McKittrick, Taft, Shafter and Waco) within a one-hour one-way commuting distance to the site. (Exs. 19, p. 264; 1, p. 5.8-1.) Applicant selected this distance because communities within this range have the greatest potential for impact since labor, especially construction workers, will be drawn from these communities. (Ex. 1, p. 5.8-1.) And, if non-local workers are required for the project, these communities will serve as their likely relocation point. (*Ibid.*)

¹⁵⁸ Under a recent amendment to Section 17620 of the Education Code (SB 50, signed on Aug. 27, 1998, Government Code, /65995), public agencies may not impose additional fees, charges, or other financial requirements to offset the cost for school facilities. (Ex. 19, p. 266.)

education for Kern County during its first 10 years of operation. (1/20 RT 55:14-16, 65:9-12; Ex. 19, pp. 146, 266.)

The payroll over the project's construction period will be approximately \$43 million, (1999 dollars) and the operation payroll will be about \$2 million (1999) dollars per year for the project's 30-year operational life. (Ex. 19, p. 266.) The bulk of the payroll will likely be spent in the area's communities: the evidence indicates that \$25 million worth of materials and equipment will be purchased locally during construction activities, and that \$3 million will be spent locally each year for operating supplies. (*Ibid.*) This spending will generate approximately \$1.8 million in sales tax revenues in the local communities. (*Ibid.*) In May 1999, Kern County granted Elk Hills a \$4 million tax incentive from County tax revenues to reimburse the cost of building public infrastructure such as roads and street lighting. (*Ibid.*)

Cumulative Effects

Cumulative effects can occur when the construction schedule of one project overlaps that of another. This situation would create a demand for workers that cannot be met by local labor and thus result in an influx of non-local workers and their dependents. (Ex. 19, p. 267.) Besides Elk Hills, other identified projects in the area include La Paloma, Sunrise, Midway-Sunset and Pastoria.¹⁵⁹ (Ex. 19, p. 267-68.) There is an approximate four-month timeframe in which these projects may have overlapping construction schedules. (Ex. 19, p. 268.) With the addition of each subsequent project, the ability of the local labor force to meet construction needs decreases. (*Ibid.*) The cumulative need for workers in particular crafts or specialties could exceed the availability of those types of workers at different times based upon the progress of the various construction schedules. (*Ibid.*)

¹⁵⁹ CEC approved La Paloma on October 6, 1999; the Sunrise PMPD was filed in May 2000, and both Midway Sunset and Pastoria are in the CEC's AFC review stage. (Ex. 19, pp. 267-268.)

An average total of 1,367 construction workers will be needed during the four-month overlap period. (Ex. 19, p. 269-70.) Furthermore, up to 3,048 secondary jobs may also emerge during this period. (*Ibid.*) These latter temporary jobs will be coincident with the construction schedules, and unlikely to attract new residents to the area. (Ex. 19, p. 270.)

Overall, the influx of non-local construction workers for all five potential projects would result in an estimated addition of 172 children to Kern County schools. (Ex. 19, p. 270.) Similarly, the influx of non-local workers needed for operation of the five projects could add about 48 children to schools closer to the projects as a result of non-local workers relocating their families. (*Ibid.*) The former could adversely affect Bakersfield area schools that are currently at or over capacity. (*Ibid.*) Schools in the immediate project vicinities, however, can absorb the latter. (*Ibid.*)

The Kern County Fire Department (KCFD) anticipates an increase in the number of emergency responses that typically occur at industrial facilities such as the proposed power plants. (Ex. 19, p. 270-71.) The KCFD has thus identified the need for additional equipment and personnel to enhance its emergency response capabilities for high angle and confined space rescues for these anticipated western Kern County facilities. (*Ibid.*)

The four expected projects in the Taft area, excluding Pastoria, will generate approximately \$1.37 million per year to the County's fire fund through property taxes (Ex. 19, p. 271.) La Paloma has agreed to provide advanced funding to the KCFD for supplementary equipment and personnel. (*Ibid.*) La Paloma will be reimbursed prospectively by the County and/or the other power plant owners. (See Condition of Certification **SOCIO-2.**)

The evidence of record demonstrates that any impacts from closure of the facility would not likely be significant, as they can adequately be addressed through the provisions contained in the Compliance Plan portion of this Decision. (Ex. 19, p. 272.)

FINDINGS AND CONCLUSIONS

Based upon the uncontroverted evidence of record, we find and conclude as follows:

1. The Elk Hills Power Project will draw primarily upon the local labor force for construction and operation workers.
2. The Elk Hills Power Project will not cause an influx of a significant number of construction or operation workers into the project area.
3. Construction and operation of the Elk Hills Power Project will result in substantially increased revenue from property and sales taxes, employment, and sales of services, manufactured goods, and equipment.
4. Kern County is the site for five proposed or approved power plants: the CEC has approved La Paloma, issued a PMPD on Sunrise, and three others (Elk Hills, Midway Sunset, and Pastoria) are currently undergoing the AFC review process. All but one, Pastoria, are located in Western Kern County. Pastoria is in Southern Kern County and is outside of the Elk Hills project area.
6. The projected construction schedules of these five power plants may result in an overlapping construction period of approximately four months.
7. Construction and operation activities of these projects, including those associated with Elk Hills, will result in increased enrollment in schools in the Bakersfield area, and in the immediate vicinities closer to the projects.
8. Many schools in the Bakersfield area are at or near enrollment capacity; while schools closer to the immediate vicinity of the proposed project are typically below capacity.
9. State law restricts school funding to property tax revenues and statutory facility fees collected at the time the building permit is issued; public agencies may not impose additional fees, charges, or other financial requirements to offset the cost of school facilities.

10. Property taxes imposed upon the Elk Hills project over its first ten years of operation will total \$20 million to Kern County, of which \$8.57 million is earmarked for education.
11. Future power plant projects in the general area will also be assessed property taxes.
12. Sufficient housing is available in the area to accommodate workers for the Elk Hills Power Project, as well as those associated with other identified projects.
13. Existing local medical, police, and fire fighting services are adequate to meet the needs of the Elk Hills Power Project, whether considered alone or in conjunction with other potential power plants, if a cumulative socioeconomic impact on fire services by power plants in western Kern County is mitigated consistent with these Conditions of Certification.
14. The Kern County Fire Department possesses sufficient equipment and personnel to provide adequate emergency response capabilities for the Elk Hills Power Project.
15. The Kern County Fire Department will require additional equipment and personnel to provide adequate emergency services to the power plants currently identified for the western Kern County area.
16. Each of the power plants proposed for the western Kern County area will benefit from the emergency services provided by the Kern County Fire Department.
17. Applicant and the Kern County Fire Department will enter into an agreement to assure that all of the identified power plant projects contribute to obtaining additional Fire Department equipment and personnel.
18. Socioeconomic impacts resulting from construction and operation activities of the Elk Hills Power Project, when considered alone or in combination with similar activities from other identified power plants in the area, will be mitigated to the extent feasible.
19. The Conditions of Certification below assure that the Elk Hills Power Project will comply with the laws, ordinances, regulations, and standards related to socioeconomics as identified in the pertinent portion of Appendix A of this Decision.

We therefore conclude that the Elk Hills Power Project will not result in any significant direct, indirect, or cumulative adverse socioeconomic impacts.

CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner shall pay the statutory school impact development fee as required at the time of filing for the in-lieu building permit with the Kern County Department of Engineering and Survey Services and Building Inspection.

Verification: The project owner shall provide proof of payment of the statutory development fee to the Compliance Project Manager (CPM) in the next Monthly Compliance Report following the payment.

SOCIO-2 In a timely manner after certification, the project owner shall reach agreement with the KCFD, La Paloma Generating Company, Midway Sunset and Sunrise Cogeneration and Power Company (if the Sunrise project has been certified) on Elk Hills share of the total funding for the following:

1. Purchase of a new 105-foot Pierce Quint Aerial ladder truck equipped for high angle and confined space rescues;
2. Provide for (a) First year funding for nine new positions for personnel to cover three shifts for the new truck; and (b) First year funding for a replacement ladder truck.

Verification: Not later than 45 days after certification, the project owner shall provide the CPM with a copy of an agreement with the KCFD and the owners of the power plant projects identified in this condition for funding of items 1 through 3 above.

D. TRAFFIC AND TRANSPORTATION

In this section, we examine the extent to which the Elk Hills Power Project will affect the regional and the local transportation systems. In some cases large numbers of construction workers can, over the course of the construction period, increase roadway congestion and affect traffic flow. Transportation of large pieces of equipment on local roadways may also prove disruptive, as well as trenching and other activities associated with building the project's linear facilities. During these licensing proceedings, we therefore identified:

- the roads and routings that will be used;
- potential traffic problems associated with those routings;
- the anticipated number of deliveries of oversized/overweight equipment;
- anticipated encroachments upon public rights-of-way;
- the frequency of, and routes associated with, delivery of hazardous materials; and
- the availability of alternative transportation methods.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The Elk Hills Power Project will increase traffic flows on the local road network. The project area is primarily served by Interstate 5 and State Route (SR) 99, which are four-lane divided highways (oriented north/south) and SR 166, 119 and 58 (Ex. 19, p. 109; see Figure 1 below.)

TRAFFIC AND TRANSPORTATION

Figure 1

(Source: Ex. 19, p. 118.)

The power plant site is adjacent to Elk Hills Road, a two-lane local road maintained by Kern County that runs north/south through the Elk Hills Oil and Gas Field. (Ex. 19, p. 118; see Figure 1.) Access to the site will be provided through two entrances. (1/27 RT 187:11-15; Ex. 19, p. 110; see Condition **TRANS-7 & 8**.) Applicant will construct a new asphalt paved access road from Skyline Road west of its intersection with Elk Hills Road.¹⁶⁰ (*Ibid.*; Ex. 19, p. 118; see Figure 1.) Entry will be through an existing gate, which OEHI now controls. (*Ibid.*) During project construction, a temporary, 40-foot wide, 135-foot long access road extending from Elk Hills Road about 600-feet north of Skyline Road will be used to receive heavy and/or over-sized equipment and materials only. (*Ibid.*) To ensure safety to motorists traveling on Elk Hills Road, Applicant will post signs and employ personnel who will be equipped with flags and radios to slow traffic during deliveries. (1/27 RT 187:15-21.)¹⁶¹

When assessing a project's potential impact on the local transportation system, levels of service (LOS) measurements represent the flow of traffic. (Ex. 19, p. 112.) LOS ranges from A, free flowing traffic, to F, which is heavily congested with flow-stoppages. (Ex. 19, pp. 112-113.) A LOS D threshold is the minimum standard accepted by both Caltrans and Kern County. (*Ibid.*) Data pertaining to existing traffic conditions on Elk Hills Road and other local roadways potentially affected by the project are presented below:

¹⁶⁰ Skyline Road is a private road that serves the Elk Hills Oil and Gas Field. (*Ibid.*)

¹⁶¹ These requirements are set forth in the Conditions. (See Conditions **TRANS-7 & 8**.)

TRAFFIC AND TRANSPORTATION Table 1
Existing Traffic Characteristics on Local Roads in the Project Area

Roadway	Location	Annual Average Daily Traffic ¹	Annual Peak Hour Traffic ²	Capacity (C)	LOS ³ (V/C)
Elk Hills Road	North of SR 119	740	74	8,000	A
Elk Hills Road	South of Skyline Road	900	90	8,000	A
Tupman Road	Northeast of SR 119	360	36	8,000	A
Wasco Way	South of SR 58	1,000	100	8,000	A
Valley West Road	East of Elk Hills Road	500	50	8,000	A

SOURCE: (Ex. 19, p. 115.)

¹ Source: Kern County Roads Department, 1999.

² Based on 10 percent of AADT.

³ LOS calculated by dividing volume (V) by capacity (C); and using the V/C ratio.

1. Traffic Congestion

a. Construction

Elk Hills construction will occur over approximately a 16-month period and will require a total construction workforce of 242 workers on average per month (assuming a single shift and a 40-hour workweek). (Ex. 19, p. 115.) During the peak construction period (the 8th month in the construction schedule), an estimated 350 construction workers will be required for the project. (Ex. 19, p. 115.) From statistics on the distribution of labor and population within Kern County, the following table presents projected vehicle trip generation from the various cities and towns in Kern County. (Ex. 19, p. 116.)

**TRAFFIC AND TRANSPORTATION Table 2
EHPP Construction Vehicle Trip Generation and Distribution**

Origin of Trip Distribution To/From EHPP Site	Average Workforce	Average Vehicle Trips	Peak Workforce	Peak Vehicle Trips
Bakersfield	152	304	221	442
Taft/Ford/Maricopa	13	26	20	40
Shafter/Wasco	11	22	15	30
Other Areas of Kern County/Southern California	66	132	96	192
TOTAL	242	484	352	704

SOURCE: (Ex. 19, p. 116.)

Construction related vehicle traffic would affect Highway 5, SR 119 and Elk Hills Road, as Table 2 projects nearly two-thirds of the commute traffic to originate in Bakersfield. (Ex. 19, p. 116; Table 2.) Applicant assumes that workers commuting from Bakersfield will take this route primarily, which would significantly impact the SR 119 junction with SR 99 (dropping from LOS D to E during peak hour). (1/27 RT 185:25-186:14; Ex. 19, p. 119.) Placement of a traffic light at the intersection, already planned and funded by Caltrans, will appropriately mitigate this temporary impact. (1/27 RT 186:5-14; Ex. 19, p. 119.) Applicant will be relieved of any funding requirement related to the traffic signal. (*Ibid.*) If the signal is not in place at the start of construction, however, Applicant will provide the use of traffic control at the intersection--police/personnel with flags, and attendant control plans-- and obtain the necessary permits from Caltrans. (See Condition **TRANS-6**.)

Otherwise, the daily and peak hour LOS for highways in the project area are not expected to be significantly effected as a result of construction workers commuting to and from the project site. (1/27 RT 148:3-12; Ex. 19, p. 116.)

The evidence further indicates that approximately 3,500 truck deliveries will be made to the plant site over the course of the construction period, or an average

of 233 per month.¹⁶² (Ex. 19, p. 122.) Applicant projects that about 70 percent of truck deliveries will originate in Bakersfield. (*Ibid.*) These drivers would use SR 99 south to SR 119, west to Elk Hills road, and then north to the power plant site. (*Ibid.*) About 20 percent would travel from the Los Angeles area via SR 99 or I-5 north to SR 119, then west to Elk Hills Road and north to the site. (*Ibid.*) The remaining 10 percent would originate north of Bakersfield, traveling south on I-5 to Stockdale Highway, then west to Elk Hills Road and south to the site. (*Ibid.*)

Using the above-described travel patterns, the following Table presents a comparison of project-related truck traffic travelling to the site, with existing truck traffic.

TRAFFIC AND TRANSPORTATION Table 3
Distribution of Plant Construction-Related Truck Traffic on Highways

Highway	Existing AADT ¹⁶³	Existing Truck AADT	Projected Average Truck Trips/Day	Average Increase in Truck Traffic
Interstate 5				
@ Jct. SR 119	22,400	8,000	22	Less than 1%
@ Jct. SR 58	23,500	7,520	2	Less than 1%
Highway 99				
@ Jct. SR 119	32,500	8,125	17	Less than 1%
SR 119				
@ I-5	5,800	1,102	22	2%
@ SR 99	9,900	2,178	17	Less than 1%

Source: (Ex. 19, p. 122.)

The increase of 12 trucks per day on average is minimal compared to existing truck traffic on highways in the project area, and represents a negligible increase (0.2 percent to 2 percent) in truck traffic. (Ex. 19, p. 122.) Accordingly, the impact of construction-related truck traffic on highways will not be significant. (*Ibid.*)

¹⁶² Assuming 20 workdays per month and two trips for each truck delivery (to and from the site), the project will produce approximately 24 truck trips per day. (Ex. 19, p. 122.)

¹⁶³ AADT is an acronym for Average Annual Daily Traffic.

Construction-related truck traffic will result in a 12 to 14 percent average increase in truck traffic on Elk Hills Road north of SR 119. (Ex. 19, p. 122.) Due to the size and weight of these trucks, increased truck traffic on Elk Hills Road will require increased roadway maintenance to meet safety standards. (*Ibid.*) Staff proposed a mitigation measure to ensure that the project owner repairs any damage to Elk Hills Road that results from construction-related truck traffic. (Ex. 19, p. 123; see Condition **TRANS-5**.)

Construction of the linear facilities associated with the project, particularly the transmission line, will also require the movement of heavy equipment, trucks, and worker vehicles along local access routes. (Ex. 19, pp. 126-127.) Staging areas will be established at the plant site and along the transmission line route to store equipment and materials. (Ex. 19, p. 126.) Elk Hills Road and Wasco Way will provide access to transmission line 1A and 1B during construction. (*Ibid.*) These roads currently operate at LOS A. (*Ibid.*) Given the small number of truck deliveries along the transmission line routes, delivery of construction equipment and materials is not projected to have significant traffic impact on Elk Hills Road or Wasco Way. (*Ibid.*)

Transmission line access will be provided by access roads, which are present in the oil field. (Ex. 19, p. 126.) Some disruption along Wasco Way- the closure of one of its two lanes- is projected with the construction of Route 1B and its variation. (*Ibid.*) In addition, Route 1B would cross SR 58, which could be closed for short periods to accommodate the installation of conductors. (Ex. 19, p. 127; See Condition **TRANS-4**.) Applicant, however, has stated its intent to mitigate these impacts by using specified traffic control matters, and off-peak-hour, single lane only road closures. (*Ibid.*) If required by Caltrans, Applicant will post signs along SR 58 to notify motorists of delays and alternate routes, and construct crossing structures and netting to minimize the duration of the closure of SR 58. (Ex. 19, p. 127; see Condition **TRANS-4**.)

Encroachment permits for construction within the Wasco Way right-of-way will be necessary where the transmission lines cross Elk Hills and Tupman Roads. (*Ibid.*) Applicant has stated its intent to comply with Kern County encroachment permit requirements, and Staff has proposed a Conditions of Certification to ensure compliance. (Ex. 19, p. 127; see Conditions **TRANS-1 & 2.**) The evidence establishes that construction of the linear facilities will not create significant adverse traffic impacts. (1/27 RT 186:15-187-10; Ex. 19, p. 127.)

The cumulative analysis for traffic and transportation takes into consideration the La Paloma, Sunrise, and Midway-Sunset generating projects. (Ex. 19, p. 128.) Although construction schedules for all of these projects may overlap somewhat, these projects will not use the same county roads as Elk Hills due to the distances between them. (*Ibid.*) Nor will commute traffic for the Elk Hills and La Paloma projects share the same state highways. (*Ibid.*) The Elk Hills and Sunrise projects will share the same state highways for commute traffic. (*Ibid.*) Peak-hour construction traffic for Sunrise, when combined with Elk Hills commuter traffic, could drop the LOS to E on SR 43, 58, 99 and 119. (*Ibid.*) A combination of factors will prevent this impact, including:

- Sunrise Condition of Certification **TRANS-4** requiring the preparation of a traffic control plan, which establishes construction work hours outside of peak traffic periods; and
- the availability of alternate routes from Bakersfield, and the likelihood that some workers will carpool. (*Ibid.*)

Other segments of the state highways shared by Elk Hills and Sunrise will operate at peak hour levels-of-service ranging from LOS A to C during Elk Hills construction. (Ex. 19, p. 128-29.) This LOS provides available capacity on these highways to accommodate both projects without a significant adverse reduction in LOS. Finally, because construction on the Midway-Sunset project is not expected to begin until sometime after peak construction of Elk Hills and Sunrise

(when the traffic impacts of these projects are declining) no significant cumulative impact is anticipated. (*Ibid.*)

b. Operation

Operation of the power plant will require approximately 20 full-time employees and a maximum of 40 vehicle trips per day.¹⁶⁴ (Ex. 19, p. 123.) Applicant assumes that the majority of the plant's workers will reside in Bakersfield and their preferred route to work will be west along SR 119 to Elk Hills Road, then north to the site. (*Ibid.*) The commute traffic generated by operation of the project represents less than one percent of existing annual average daily traffic (AADT) on SR 119 and an estimated five percent on Elk Hills Road. (*Ibid.*) This minimal amount of traffic will not have a significant impact on the state highways and local roads serving the project. (*Ibid.*)

c. Closure

Unexpected temporary closure of the Elk Hills facility would likely result in impacts to traffic and transportation that are similar to those for normal operation of the plant. (Ex. 19, pp. 130.) In case of permanent closure, traffic and transportation impacts would be similar to those associated with project construction. (*Ibid.*) Permanent closure will involve a peak work period of increased commute traffic. (*Ibid.*) As with construction impacts, the local roadway system within the vicinity of the project should be able to handle such traffic without a significant impact to the current LOS of the area roads. (*Ibid.*)

2. Hazardous Materials Deliveries

The CEC evaluated the potential impacts from the use of anhydrous ammonia at the Elk Hills Power Project. Since that time Applicant has decided to use

¹⁶⁴ Applicant will provide on-site parking. (Ex. 19, p. 123.)

aqueous ammonia, a less hazardous substance. All roads in the project area are operating at level of service A. (Ex. 19, p. 115, Table 2.) The additional truck traffic generated by the change from anhydrous, one trip every three weeks, to aqueous, conservatively estimated at twice a week, will not decrease the level of service of any local roads. (Ex. 19, p. 115 & 123; 1/15/00 RT 178:119-178:22; 1/27/00 RT 73:25-74:7.) Since Staff's worst case single day analysis included the ammonia truck trip and the conservatively projected deliveries do not exceed one trip per day, the worst case operation day traffic analysis will not change.

The Commission has evaluated numerous facilities proposing to use and transport aqueous ammonia and determined in each instance that the use of aqueous ammonia does not pose a significant risk to the public or the environment. Based upon prior analyses, we have found that aqueous ammonia transport overall poses a similar or reduced risk in comparison with anhydrous ammonia.

Although the use of aqueous ammonia requires more trips to the site, the potential consequences from a release during transport decreases. (1/27/00 RT 74:8-74:16; 156:18-156:20; 163:19-163:21; 222:2-222:8.) Since our analysis has found no significant impacts from the use of anhydrous ammonia, we conclude that there will be no significant adverse impact or health risk from the transport of aqueous ammonia.

COMMISSION DISCUSSION

The evidence of record is undisputed that with the Conditions of Certification proposed by Staff, the project can comply with applicable LORS, which apply to transportation-related aspects of the project. The evidence establishes that local roads are adequate to accommodate the peak transportation loads during construction and the modest traffic related to operation of the project. Furthermore, the project as mitigated will not cause any significant direct, indirect

or cumulative impacts to the existing transportation system in Kern County. (Ex. 19, p. 122; Table 6.)

Virtually all modern thermal power plants fired by natural gas must use ammonia as part of their selective catalytic reduction systems to control NOx emissions. The Commission has licensed plants using either anhydrous or aqueous ammonia as part of their SCR systems. (1/27 RT 201:6-203:1.)

We find it reasonable to conclude that adherence to laws, ordinances, regulations, and standards concerning the transportation of ammonia will prevent significant harm to the public. (1/27 RT 188:24-190-6.) The record is undisputed that Applicant can and will abide by current requirements. Implementation of the following Conditions of Certification--together with LORS compliance--make it likely that transportation of ammonia to the project will pose no significant threat to the health and safety of the public. Thus, Applicant has met its burden of proof in this area.

FINDINGS AND CONCLUSIONS

Based upon the evidence of record, we find and conclude as follows:

1. Construction and operation of the Elk Hills Power Project will cause increased traffic on the local area's road network.
2. The capacities of the roads in the local area are sufficient to satisfactorily absorb the increased traffic occasioned by construction and operation of the Elk Hills Power Project.
3. All potential adverse impacts from the transportation and handling of hazardous substances can be mitigated to a level of insignificance by complying with applicable law.
4. Compliance with the Conditions of Certification of this Decision will mitigate the transportation and handling of hazardous materials during the construction and operation phases

5. Construction activities will encroach upon public rights-of-way, and create adverse impacts upon roadway function and levels of service.
6. Impacts upon roadways due to construction activities are temporary and not significant.
7. Construction and operation of the Elk Hills Power Project will not contribute to cumulatively significant adverse traffic impacts.
8. The Conditions of Certification below ensure that construction and operation of the Elk Hills Power Project will comply with applicable laws, ordinances, regulations, and standards related to traffic and transportation as identified in Appendix A.

We therefore conclude that construction and operation of the project will not result in significant direct, indirect, or cumulative adverse impacts to the area's transportation network.

CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall comply with Caltrans and Kern County limitations on vehicle sizes and weights. In addition, the project owner or its contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for roadway use.

Verification: In the Monthly Compliance Reports during construction, and in the Annual Compliance Reports during operation, the project owner shall submit copies of any oversize and overweight transportation permits received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after receipt of these permits.

TRANS-2 The project owner or its contractor shall comply with Caltrans and Kern County limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

Verification: In Monthly Compliance Reports during construction, and in the Annual Compliance Reports during operation, the project owner shall submit copies of any encroachment permits received during the reporting period. In addition, the project owner shall retain copies of these permits and

supporting documentation in its compliance file for at least six (6) months after receipt of these permits.

TRANS-3 The project owner shall ensure that all federal and state regulations for the transport of hazardous materials are observed during both construction and operation of the facility.

Verification: The project owner shall provide, in their Monthly Compliance Reports during construction, and in the Annual Compliance Reports during operation, to the CPM, copies of all permits and licenses of the haulers contracted to transport hazardous substances.

TRANS-4 The project owner or its contractor shall install crossing structures and netting, if required by Caltrans, across State Route 58 as a safety precaution and to reduce the potential for damage from falling construction materials or equipment during cable-stringing activities. Prior to cable stringing, the project owner shall consult with Caltrans, and prepare and submit to the CPM a safety plan and implementation program.

Verification: At least thirty (30) days prior to wire stringing, the project owner shall provide to the CPM for review and approval, a copy of its safety plan and implementation program.

TRANS-5 Following construction of the power plant and all related facilities, the project owner shall meet with the CPM and Kern County to determine if any actions are necessary and develop a schedule to complete the repair of any roadways damaged due to project construction.

Protocol: Prior to start of construction, the project owner shall photograph the road pavement on Elk Hills Road from the junction of State Route 119 north to the project site. The project owner shall provide the CPM and Kern County with a copy of these photographs. Following project construction, the project owner will meet with the CPM and Kern County to determine the project-related road damage, if any.

Verification: Prior to the start of construction, the project owner shall provide the CPM and Kern County a copy of the roadway photographs. Within 30 days of the completion of project construction, the project owner shall meet with the CPM and Kern County and determine if any roadway repairs are necessary. The project owner shall provide a copy of a letter from Kern County acknowledging satisfactory completion of the roadway

repairs, if necessary, in the first Annual Compliance Report following start of operation of the Elk Hills Power Project.

TRANS-6 If the traffic signal planned for the State Route 119/99 junction is not in place prior to the start of construction of the Elk Hills Power Project, the project owner shall provide traffic control at the SR 119/99 junction during construction of the EHPP through the use of a policeman/flagman during peak traffic hours. The project owner shall provide traffic control during the construction phase of the Elk Hills Power Project until the traffic signal is installed.

Protocol: The use of a policeman/flagman requires that a Traffic Control Plan be submitted to Caltrans prior to issuance of a permit.

Verification: At least forty five (45) days prior to start of project construction, the project owner shall submit a Traffic Control Plan to Caltrans for approval. The project owner shall provide the CPM a copy of a letter from Caltrans acknowledging approval of the Traffic Control Plan at least fifteen (15) days prior to the start of construction.

TRANS-7 The project owner shall provide two entrances to the Elk Hills Power Project. The project owner shall direct normal traffic to and from the power plant site through the existing OEHI of Elk Hills, Inc. gate located on the west side of Elk Hills Road at Skyline Road. The project owner shall construct a temporary, 40-foot wide, 135-foot long access road extending from Elk Hills Road approximately 600 feet north of the intersection of Skyline Road and Elk Hills Road. The project owner shall only utilize the temporary access road for receiving heavy and over-sized equipment and materials during project construction.

Verification: At least thirty (30) days prior to the start of project construction, the project owner shall provide the CPM with written documentation explaining how the project owner will direct normal traffic to utilize the existing access road at Skyline Road. The project owner also shall document how normal traffic will be prevented from using the temporary access road off Elk Hills Road north of Skyline Road, which is intended only for use by trucks delivering heavy and/or over-sized construction equipment and materials. At least 30 days prior to the start of project construction, the project owner also shall provide the CPM a copy of the approved encroachment permit that Kern County requires for construction of the temporary access road off Elk Hills Road.

TRANS-8 Prior to the start of project construction, the project owner shall consult with Kern County, and prepare and submit to the CPM for approval a construction traffic control plan and implementation program for use of the temporary access road off Elk Hills Road and north of Skyline Road by trucks delivering heavy and/or over-sized construction equipment and materials. The plan shall address the following issues:

1. timing of heavy and/or over-sized equipment and materials deliveries;
2. signing, lighting, and traffic control device placement; and
3. use of a flagman.

Verification: At least 30 days prior to start of project construction, the project owner shall provide the CPM for review and approval, a copy of its construction traffic control plan and implementation program.

TRANS-9 The project owner shall develop and implement a safety management plan for delivery of ammonia. The plan shall include procedures, protective equipment requirements, training, a checklist, and the specification of delivery routes.

Verification: 30 days prior to the first delivery of ammonia to the project site, the project owner shall submit an ammonia transportation safety management plan to the CPM for review and approval. The project owner shall include in the monthly compliance report during construction, and in the annual compliance reports during operation, a summary of actions taken in compliance with the safety management plan.

E. VISUAL RESOURCES

Visual resources are the natural and the cultural features of the environment that one sees. Visual quality is considered to be the value of these visual resources. Scenic resources are those visual resources that contribute positively to visual quality. Under this topic, it is thus relevant to assess whether the project will create a substantial intrusion upon the viewshed.¹⁶⁵

SUMMARY AND DISCUSSION OF THE EVIDENCE

The Elk Hills Power Project s proposed location is on a 12-acre site located in the center of the roughly 74-square mile Elk Hills Oil and Gas Field operated by OEHI. (1/20 RT 42:8-43:6.) The petroleum reserve is generally off limits to the public; the only public access and visibility is from Elk Hills Road. (*Ibid.*) Elk Hills Road is a county highway that passes north/south across the center of the reserve. (Ex. 19, p. 162.)

The site is currently occupied by out-of-service tanks and related equipment formerly used for the storage and loading of propane, butane, and natural gas liquid products. (Ex. 19, p. 161.) In addition to the gas processing facilities, the site includes a cogeneration plant, liquefied petroleum gas storage and loading facility, and a one-story administration building. (Ex. 19, p. 163; see Figures 2a and 2b below.) Much of the land has been graded and left with either dirt or gravel surfaces with some paved surfaces. (*Ibid.*)

¹⁶⁵ A visual impacts determination and an inquiry whether a proposed project complies with applicable LORS is required under current law and regulations. (Ex. 19, p. 157.) In the present instance, however, there are no specific pertinent federal, state, or local LORS applicable to the project s visual or aesthetic resources. (Ex. 19, p. 160-61.) Visual or aesthetic resources are addressed in the Kern County General Plan, Open Space Element, and are implemented by the Kern County Planning and Development Services Department. (Ex. 19, p. 161.) Since the Elk Hills project is consistent with the land use designation for the area, it is also consistent with associated visual resource planning policies and General Plan requirements.)

The proposed plant site is on a large generally flat plateau on the crest of Elk Hills range. (Ex. 19, p. 163.) The Elk Hills are a 16-mile long, 6-mile wide southeast trending foothill spur of the Temblor range to the west. (*Ibid.*) The climate is arid, and the hills are covered with a mantle of low growing annual grasses. (*Ibid.*)

Elk Hills has been subject to intensive oil and gas exploration since the early part of the 20th Century. (Ex. 19, p. 162.) A network of access roads, terraced drilling areas, oil pumps, above ground pipelines, and processing facilities are all prominently visible within the landscape pattern. (*Ibid.*) Most of the Elk Hills Oil and Gas Field lands were fenced off and restricted during the time it was a Naval Petroleum Reserve, and OEHI has continued these public access restrictions. (Ex. 19, p. 162.)

The evidence of record contains the results of analyses performed to assess the project's visual impact. (Ex. 19, p. 163-64.) These analyses are based, in part, on viewshed evaluations from "Key Observation Points" (KOP). (Ex. 19, p. 159.) Staff selected KOPs to provide the basis for evaluation of potential impacts by comparing the appearance of existing visual features in the project vicinity before and after project construction.¹⁶⁶ (Ex. 19, p. 159; 163-64.) KOPs include locations that are chosen to be representative of the most critical locations from which the project would be seen. (*Ibid.*)

Staff and Applicant chose five KOPs for the development of photo simulations that could be used as a basis for visualizing the plant's potential effects. (Ex. 19, p. 164.) **Visual Resources Figure 1** below shows the location of the KOPs used in the analysis and the direction of each view. KOP views of the power plant's

¹⁶⁶ KOPs were not identified or defined for the water supply and wastewater lines because they will be underground or on the ground either invisible or not highly visible. (Ex. 19, p. 164.) In addition, they will generally be located within the 74 square mile boundaries of the Elk Hills Oil and Gas Field where public access is restricted. (*Ibid.*)

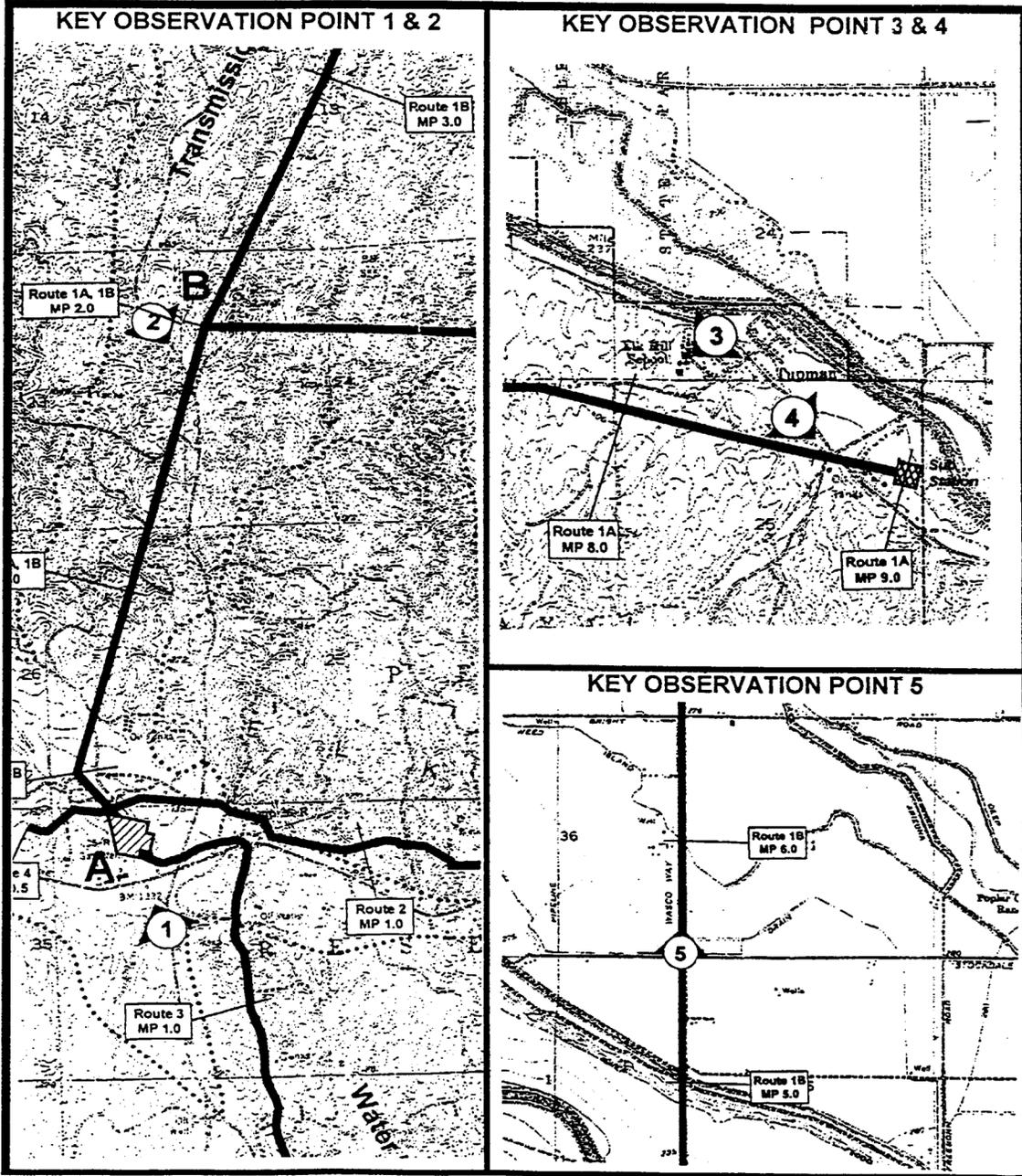
existing location and a simulated view of the constructed power plant appear below in **Visual Resources Figures 2a and 2b**.

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VISUAL RESOURCES Figure 1
Key Observation Points



January 5, 2000

165

VISUAL RESOURCES

VISUAL RESOURCES

Figure 2a

Existing View of Proposed Power Power Plant

Source: (Ex. 19, p. 189.)

VISUAL RESOURCES

Figure 2b

Simulated View of the Proposed Elk Hills Power Project

Source: Ex. 19

The proposed project, including the linear facilities, is located on private land and, thus, is not subject to federal land-management requirements. (Ex. 19, p. 160.) Moreover, no federal or state regulations pertaining to scenic resources are applicable to the project because there are no designated scenic highways, roads, or corridors in the project's vicinity.¹⁶⁷ (*Ibid.*) In general, the project area can be characterized as (1) an area of working landscapes devoted to petroleum production and agriculture; (2) without exceptional scenic features; and, (3) where scenic and aesthetic values have not been given a high priority. (Ex. 20, Attachment A, p. 2, testimony of Thomas Priestley.)

The evidence demonstrates that a visual impact is a combination of viewer susceptibility and the impact's severity. (Ex. 19, p. 164.) The susceptibility to visual impacts from the KOPs is summarized below in Table 1.

VISUAL RESOURCES Table 1
Summary of Visual Impact Susceptibility - Key Observation Points

	VISUAL QUALITY	VIEWER SENSITIVITY	VISIBILITY	VIEWER EXPOSURE
Key Observation Point 1	Low	Low	Moderate	Moderate
Key Observation Point 2	Low to Moderate	Low	Moderate	Moderate
Key Observation Point 3	Moderate	Moderate	Moderate to High	Moderate to High
Key Observation Point 4	Low to Moderate	Low	Low to Moderate	Moderate
Key Observation Point 5	Moderate	Moderate	Moderate to High	Moderate

Source: (Ex. 19, p. 166.)

¹⁶⁷ Although several recreation and natural preserve areas around the outer fringes of the project area are being managed in a way that protects their landscape qualities, none of the lands that will be directly affected by the project have been designated for special protection of their landscape's aesthetic attributes. (Ex. 20, Attachment A, p. 2, testimony of Thomas Priestley.)

The component elements of "susceptibility" are the existing visual quality, and viewer sensitivity, visibility, and exposure. (Ex. 19, pp. 159-60, 164.) Relevant factors in assessing a potential impact's "severity" include contrast with the existing viewshed, scale and spatial dominance, and view blockage. (Ex. 19, p. 160.)

Based upon a combination of these evaluative criteria, and in evaluating the five KOPs, Staff concluded that the project might cause visual impacts in the area of KOPs 3 and 5. (1/20 RT 49:6:11; Figure 1.) KOP 3 represents the eastern view of a portion of the transmission-line alternative route 1A, which will be most visible from the western edge of the community of Tupman.¹⁶⁸ (1/20 RT 49:6:10; Ex. 19, p. 167.)

KOP 5 is the proposed transmission-line 1B along Wasco Way. (1/20 RT 49:10:11; Ex. 19, 168; Figure 1.) There are approximately six rural residential units along Wasco Way. (Ex. 19, p. 173.) Power poles now line both sides of the road, and Wasco Way appears as a well-defined transmission corridor. (*Ibid.*) Staff has recommended that the project's new 120-foot high steel poles, which will replace existing poles, be more widely spaced and sited to avoid placement directly in front of any residences. (1/20 RT 49:15-18; Condition **VIS-4**.) Staff has also recommended additional mitigation, which requires color treatment of the transmission poles to blend into the background. (1/20 RT 49:12-22; Condition **VIS-1**.)

From KOP 1, on the east side of Elk Hills Road, the project site's visibility is in the foreground and middle ground views from the approximately 900 vehicles per day that travel the road. (Ex. 19, p. 166.) The view has the general character of an arid, open landscape devoted to oil and gas production and gas processing facilities. (*Ibid.*) From KOP 2, the public traveling south on Elk Hills Road can

¹⁶⁸ Tupman is a small, unincorporated residential community located in the eastern end of the Elk Hills at the base of its northern slopes. (Ex. 19, p. 163.)

see the transmission line and poles from the road. (Ex. 19, p. 167.) The landscape visible in this view is, however, disturbed by the patterns in the grass on the hillsides indicating the presence of access roads related to oil and gas production activities. (*Ibid.*) From KOP 4, east of Tupman, as the alignment of transmission line alternative Route 1A crosses Tupman Road, the view is an unobstructed panoramic across the valley. (Ex. 19, p. 168.) Existing 37-foot high wooden electrical lines are in the foreground. (*Ibid.*) The terrain in this area is flat to slightly rolling and the vegetation is low grass. (*Ibid.*) The transmission line will be visible to a handful of homes at the very easterly edge of Tupman, and to approximately 360 vehicles per day on Tupman Road. (*Ibid.*)

Painting the facility to blend with the background and properly designing outdoor lighting, as required in the Conditions of Certification, further reduce the project's visibility. (1/20 RT 49:19-50:3; Condition **VIS-1**.) The testimony establishes that with the mitigation measures in place, the residual visual impression of the Elk Hills Power Project will not be significant. (1/20/00 RT, 42:21-43:11.) Activities such as project staging and material storage would blend with the context of adjacent land activities, and be temporary in nature. (*Ibid.*) Other project-related activities such as fugitive dust disturbances, while potentially visually prominent, would also be temporary in nature. (Ex. 19, p. 169.) Furthermore, the power plant site is sufficiently far from residences and heavily trafficked areas that visual impacts due to construction and operation would not be significant. (Ex. 19, pp. 169-178.)

The Elk Hills Power Project would not contribute to a cumulative visual impact to sensitive receptors since none of the local residential viewers with a view of one plant will have a view of the other potential power plants (i.e., the La Paloma, Sunrise, and Midway-Sunset projects). (Ex. 19, p. 178.) In addition, approximately seven to eight miles visually separate the Elk Hills viewshed from the other projects. (*Ibid.*) Finally, any Elk Hills transmission lines terminating at Midway Substation (proposed line 1B), near Buttonwillow, will not have a

significant cumulative impact. (*Ibid.*) This is because the proposed La Paloma line connecting at Midway Substation will approach the substation from the opposite direction. (*Ibid.*) In addition, the Buttonwillow area already has a high density of transmission lines and the incremental impact of the Elk Hills lines will be difficult to distinguish from the other transmission lines. (*Ibid.*)

A Closure Plan submitted in the event of a planned or unexpected permanent closure will address removal of the facility's structures and transmission poles to reduce residual visual impacts. (Ex. 19, p. 179.) This measure should also be included within the project's Contingency Plan provisions. (*Ibid.*)

FINDINGS AND CONCLUSIONS

Based upon the uncontroverted evidence of record, we find and conclude as follows:

1. The Elk Hills Power Plant will be constructed in an area of existing oilfield and industrial development.
2. Construction of the Elk Hills Power Project will add a noticeable, but not significant, industrial increment to the existing viewshed.
3. The Conditions of Certification below require the implementation of mitigation measures sufficient to minimize the visual intrusion of the Elk Hills Power Project.
4. The Elk Hills Power Project will not contribute to a significant adverse cumulative visual impact.

We therefore conclude that construction and operation of the Elk Hills Power Project will not cause any significant direct, indirect, or cumulative adverse visual impacts.

CONDITIONS OF CERTIFICATION

VIS-1 Prior to the start of commercial operation, the project owner shall treat the project structures, buildings, towers, substation, tanks and transmission poles visible to the public in a non-reflective color to blend with the surroundings. The project owner shall treat the cooling towers with a heat-resistant color that minimizes contrast and harmonizes with the surrounding environment.

Protocol: The project owner shall submit a treatment plan for the project to the California Energy Commission Compliance Project Manager (CPM) for review and approval. The treatment plan shall include:

1. specification, and 11 x 17 color simulations, of the treatment proposed for use on project structures, including structures treated during manufacture;
2. a detailed schedule for completion of the treatment; and, a procedure to ensure proper treatment maintenance for the life of the project.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall submit to the CPM a revised plan.

After approval of the plan by the CPM, the project owner shall implement the plan according to the schedule and shall ensure that the treatment is properly maintained for the life of the project.

For any structures that are treated during manufacture, the project owner shall not specify the treatment of such structures to the vendors until the project owner receives notification of approval of the treatment plan by the CPM.

The project owner shall not perform the final treatment on any structures until the project owner receives notification of approval of the treatment plan from the CPM.

The project owner shall notify the CPM within one week after all precolored structures have been erected and all structures to be treated in the field have been treated and the structures are ready for inspection.

Verification: Not later than 30 days prior to ordering the first structures that are color treated during manufacture, the project owner shall submit its proposed plan to the CPM for review and approval. If the CPM notifies the

project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

Verification: Not less than 30 days prior to the start of commercial operation, the project owner shall notify the CPM that all structures treated during manufacture and all structures treated in the field are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-2 Any fencing for the project shall be non-reflective.

Protocol: Prior to ordering the fencing the project owner shall submit to the CPM for review and approval the specifications for the fencing documenting that such fencing will be non-reflective.

If the CPM notifies the project owner that revisions of the specifications are needed before the CPM will approve the submittal, the project owner shall submit to the CPM revised specifications.

The project owner shall not order the fencing until the project owner receives approval of the fencing submittal from the CPM.

The project owner shall notify the CPM within one week after the fencing has been installed and is ready for inspection.

Verification: At least 30days prior to ordering the non-reflective fencing, the project owner shall submit the specifications to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the fencing that the fencing is ready for inspection.

VIS-3 Prior to the start of commercial operation, the project owner shall design and install all lighting such that light bulbs and reflectors are not visible from public viewing areas and illumination of the vicinity and the nighttime sky is minimized. To meet these requirements:

Protocol: The project owner shall develop and submit a lighting plan for the project to the CPM for review and approval. The lighting plan shall require that:

1. Lighting is designed so that exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of this outdoor lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;
2. High illumination areas not occupied on a continuous basis such as maintenance platforms or the main entrance are provided with switches or motion detectors to light the area only when occupied; and
3. A lighting complaint resolution form (following the general format of that in attachment 1) will be used by plant operations, to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

Lighting shall not be installed before the plan is approved. The project owner shall notify the CPM when the lighting has been installed and is ready for inspection.

Verification: At least 90 days before ordering the exterior lighting, the project owner shall provide the lighting plan to the CPM for review and approval. The CPM will notify the project owner of approval or disapproval within 15 days of receipt of the lighting plan. If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days of completing exterior lighting installation that the lighting is ready for inspection. If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the landscaping that the landscaping is ready for inspection.

VIS-4 To minimize potential visual impacts, the project owner shall not place any electrical transmission poles directly in front of any residences.

Protocol: Prior to construction of the transmission line, the project owner shall submit a plan to the CPM showing:

1. All proposed pole locations;
2. All residences within one-quarter mile of the proposed transmission route that have a view of the transmission line.

Installation of transmission line poles shall not begin before the plan is approved. The project owner shall notify the CPM when the poles have been installed and are ready for inspection.

Verification: At least 60 days prior to beginning transmission line construction, the project owner shall provide the electrical transmission pole plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

VIS-5 Prior to the start of commercial operation, the project owner shall implement a landscape plan that meets the requirements of the Kern County Zoning Code.

The project owner shall submit to the CPM for review and approval a specific plan describing its landscaping proposal. The project owner shall provide the CPM a letter of comment from the Kern County Planning Director stating that the landscape plan is consistent with the provisions of the Kern County General Plan and Zoning Ordinance. The plan shall include, but not be limited to:

1. a detailed landscape plan, at a reasonable scale, which includes a list of proposed tree and shrub species and sizes and a discussion of the suitability of the plants for the site conditions and mitigation objectives.
2. maintenance procedures, including any needed irrigation; and
3. a procedure for replacing unsuccessful plantings.

If the CPM notifies the project owner that plan revisions are needed, the project owner shall prepare and submit to the CPM a revised plan for CPM approval.

The trees and shrubs shall not be planted before the plan is approved. The project owner shall notify the CPM when the trees and shrubs have been planted and are ready for inspection.

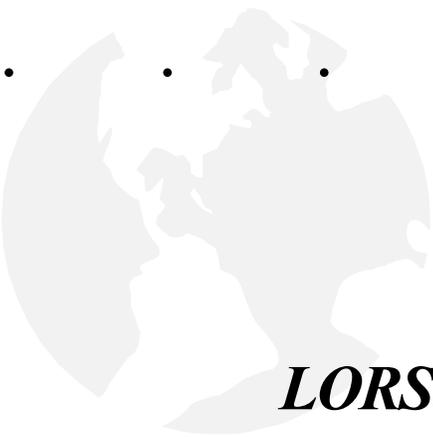
Verification: At least 90 days prior to the start of commercial operation, the project owner shall submit the proposed landscape plan to the CPM for review and approval. The CPM will respond to the project owner within 15 days of receipt of the landscaping plan.

The project owner shall submit any required revisions within 15 days of notification by the CPM. The CPM will respond to the project owner within 15 days of receipt of the revised documents. The project owner shall notify the CPM in the next Monthly Compliance Report following completion of the proposed planting that the planting is ready for inspection.

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ELK HILLS
POWER PROJECT

Appendix A



*LORS: Laws, Ordinances,
Regulations, and Standards*

AIR QUALITY

FEDERAL

Under the Federal Clean Air Act (40 CFR 52.21), there are two major components of air pollution law, New Source Review (NSR) and Prevention of Significant Deterioration (PSD). NSR is a regulatory process for evaluation of those pollutants that violate federal ambient air quality standards. Conversely, PSD is a regulatory process for evaluation of those pollutants that do not violate federal ambient air quality standards. The NSR analysis has been delegated by the US Environmental Protection Agency (EPA) to the San Joaquin Valley Unified Air Pollution Control District (District). The EPA determines the conformance with the PSD regulations. The PSD requirements apply only to those projects (known as major sources) that exceed 100 tons per year for any pollutant.

STATE

The California State Health and Safety Code, section 41700, requires that no person shall discharge from any source whatsoever such quantities of air contaminants or other material which 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.

LOCAL

The proposed project is subject to the following San Joaquin Valley Unified Air Pollution Control District rules and regulations:

RULE 2201 - NEW AND MODIFIED STATIONARY SOURCE REVIEW RULE

The main functions of the District's New Source Review Rule are to allow for the issuance of Authorities to Construct, Permits to Operate, the application of Best Available Control Technology (BACT) to new permit sources and to require the new permit source to secure emission offsets.

SECTION 4.1 - BEST AVAILABLE CONTROL TECHNOLOGY

Best Available Control Technology is defined as: a) has been contained in any State Implementation Plan and approved by EPA; b) the most stringent emission limitation or control technique that has been achieved in practice for a class of source, or c) any other emission limitation or control technique which the District's Air Pollution Control Officer (APCO) finds is technologically feasible and is cost effective. BACT will apply to any air pollutant that results in an emissions increase of 2 pounds per day. In the case of the EHPP, BACT will apply for NO_x, SO₂, PM₁₀, VOC and CO emissions from all point sources of the project.

SECTION 4.2 - OFFSETS

Emissions offsets for new sources are required when those sources exceed the following emissions levels:

- Sulfur oxides - 150 lbs/day
- PM10 - 80 lbs/day
- Oxides of nitrogen - 10 tons/year
- Volatile organic compounds - 10 tons/year

The EHPP exceeds all of the above emission levels; therefore offsets are required for all four of these pollutants. The emission offsets provided shall be adjusted according to the distance of the offsets from the EHPP. The ratios are:

- Within 15 miles of the same source - 1.2 to 1
- 15 miles or more from the source - 1.5 to 1

Section 4.2.5.3 allows for the use of interpollutant offsets (including PM10 and precursors for PM10) on a case-by-case basis, provided that the applicant demonstrates that the emissions increase will not cause a violation of any ambient air quality standard. The ratio for interpollutant trading shall be based on an air quality analysis and shall be equal to or greater than the minimum offsetting requirements (the distance ratios) of this rule.

SECTION 4.3 - ADDITIONAL SOURCE REQUIREMENTS

Rule 4.3.2.1 requires that a new source not cause, or make worse, the violation of an ambient air quality standard as demonstrated through analysis with air dispersion models.

RULE 2520 — FEDERALLY MANDATED OPERATING PERMITS

Requires that a project owner file a Title V Operating Permit with the District within 12 months of commencing operation. A project is subject to this requirement if any of the following apply: the project is a major stationary source (under PSD definitions), it has the potential to emit greater than 100 tons per year of a criteria pollutant, that any equipment is subject to New Source Performance Standards, the project is subject to Title IV Acid Rain program, or the applicant is required to obtain a PSD permit from EPA. The Title V permit application requires that the owner submit information on the operation of the air polluting equipment, the emission controls, the quantities of emissions, the monitoring of the equipment as well as other information requirements.

RULE 2540 — ACID RAIN PROGRAM

A project greater than 25 MW and installed after November 15, 1990, must submit an acid rain program permit application to the District. The acid rain requirements will become part of the Title V Operating Program (Rule 2520). The specific

requirements for the EHPP will be discussed in the section, Compliance with LORS — Local later in this analysis.

RULE 4001 - NEW SOURCE PERFORMANCE STANDARDS

Rule 4001 specifies that a project must meet the requirements of the Federal New Source Performance Standards (NSPS) specified in Title 40, Code of Federal Regulations (CFR), Part 60, Chapter 1. Subpart GG, which pertains to Stationary Gas Turbines, requires that NO_x concentrations are a function of the heat rate of the combustion, which in this case would be approximately 116 ppmv at 15% O₂. In addition, the SO₂ concentration shall be less than 150 ppmv and the sulfur content of the fuel shall be no greater than 0.8 percent by weight.

RULE 4101 - VISIBLE EMISSIONS

Rule 4101 prohibits air emissions, other than water vapor, of more than Ringelmann No. 1 (20 percent opacity) for more than 3 minutes in any one hour.

RULE 4201 - PARTICULATE MATTER CONCENTRATION

Rule 4201 limits particulate emissions from sources such as the gas turbines, cooling towers and emergency fire water pumps to less than 0.1 grain per cubic foot of exhaust gas at dry conditions.

RULE 4202 — PARTICULATE MATTER EMISSION RATE

Rule 4202 limits hourly particulate emissions based on the process rate of the process. Combustion of gaseous and liquid fuels are excluded from this rule, however, the particulate emissions associated with the cooling tower are subject to the emission limits of this rule.

RULE 4703 - STATIONARY GAS TURBINES

Rule 4703 limits NO_x concentrations to 12.2 ppm for the SCR controlled turbines and 21 ppm for the SCONO_x controlled turbine. In addition there is a limit in CO concentrations of less than 200 ppm.

RULE 4801 - SO₂ CONCENTRATION

Rule 4801 limits the SO₂ concentration emitted into the atmosphere to no greater than 0.2 percent by volume.

RULE 8010 - FUGITIVE DUST ADMINISTRATIVE REQUIREMENTS FOR CONTROL OF FINE PARTICULATE MATTER (PM₁₀)

Rule 8010 specifies the types of chemical stabilizing agents and dust suppressant materials that can (and cannot) be used to minimize fugitive dust.

RULE 8020 - FUGITIVE DUST REQUIREMENTS FOR CONTROL OF FINE PARTICULATE MATTER (PM10) FROM CONSTRUCTION, DEMOLITION, EXCAVATION, AND EXTRACTION ACTIVITIES

Rule 8020 requires that fugitive dust emissions during construction activities be limited to no greater than 40 percent opacity by means of water application or chemical dust suppressants. The rule also encourages the use of paved access aprons, gravel strips, wheel washers or other measures to limit mud or dirt carry-out onto paved public roads.

RULE 8030 - CONTROL OF PM10 FROM HANDLING AND STORAGE OF BULK MATERIALS

Rule 8030 limits the fugitive dust emissions from the handling and storage of materials. It specifies that bulk materials be transported using wetting agents, allow appropriate freeboard space in the vehicles, or be covered. It also requires that stored materials be covered or stabilized.

RULE 8060 - CONTROL OF PM10 FROM PAVED AND UNPAVED ROADS

Rule 8060 specifies the width of paved shoulders on paved roads or the use of chemical dust suppressants on unpaved roadways, shoulders and medians.

RULE 8070 - CONTROL OF PM10 FROM VEHICLE/EQUIPMENT PARKING, SHIPPING, RECEIVING, TRANSFER, FUELING AND SERVICE AREAS

This rule is intended to limit fugitive dust from unpaved parking areas by means of using water or chemical dust suppressants or the use of gravel. It also requires that the affected owners/operators shall remove tracked out mud and dirt onto public roadways once a day.

BIOLOGICAL RESOURCES

FEDERAL

ENDANGERED SPECIES ACT OF 1973

Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.

MIGRATORY BIRD TREATY ACT

Title 16, United States Code, sections 703 - 712, prohibits the take of migratory birds.

STATE

CALIFORNIA ENDANGERED SPECIES ACT OF 1984

Fish and Game Code sections 2050 et seq. protects California s rare, threatened, and endangered species.

NEST OR EGGS — TAKE, POSSESS, OR DESTROY

Fish and Game Code section 3503 protects California s birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird.

BIRDS OF PREY OR EGGS — TAKE, POSSESS, OR DESTROY

Fish and Game Code section 3503.5 protects California s birds of prey and their eggs by making it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

MIGRATORY BIRDS — TAKE OR POSSESSION

Fish and Game Code section 3513 protects California s migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird.

FULLY PROTECTED SPECIES

Fish and Game Code sections 3511, 4700, 5050, and 5515 prohibits take of animals that are classified as Fully Protected in California.

SIGNIFICANT NATURAL AREAS

Fish and Game Code section 1930 et seq. designates certain areas such as refuges, natural sloughs, riparian areas and vernal pools as significant wildlife habitat.

STREAMBED ALTERATION AGREEMENT

Fish and Game Code section 1600 et seq. requires California Department of Fish and Game (CDFG) to review project impacts to waterways, including impacts to vegetation and wildlife from sediment, diversions and other disturbances.

NATIVE PLANT PROTECTION ACT OF 1977

Fish and Game Code section 1900 et seq. designates state rare, threatened, and endangered plants.

CALIFORNIA CODE OF REGULATIONS

Title 14, sections 670.2 and 670.5 list animals of California designated as threatened or endangered.

LOCAL

KERN COUNTY GENERAL PLAN LAND USE, OPEN SPACE, AND CONSERVATION ELEMENTS OF 1994

SECTION 8, RESOURCES

Policy 14: Habitats of threatened and endangered species should be protected to the greatest extent possible.

KERN COUNTY GENERAL PLAN ENERGY ELEMENT OF 1990

PART 1 - ISSUES, GOALS, POLICIES, AND IMPLEMENTATION

Policy 12: The County should work closely with local, state, and federal agencies to assure that all projects, both discretionary and ministerial, avoid or minimize direct impacts to fish, wildlife and botanical resources, whenever practical.

Policy 13: The County should develop and implement measures which result in long-term compensation for wildlife habitat which is unavoidably damaged by energy exploration and development activities.

CULTURAL RESOURCES

FEDERAL

Portions of the routes proposed for the electric transmission lines cross land managed by the US Bureau of Land Management (BLM). Therefore, the project may become an undertaking according to federal definition and the BLM would be involved as the lead federal agency for cultural and paleontologic resources. If cultural resource sites are identified on non-federal lands, and they meet federal criteria for eligibility for listing in the National Register of Historic Places, then federal laws would also apply to these resources.

- National Environmental Policy Act (NEPA): Title 42, United States Code (USC), section 4321 et seq., requires federal agencies to consider potential environmental impacts of projects with federal involvement and to consider appropriate mitigation measures.
- Federal Land Policy and Management Act (FLPMA): Title 43, USC, section 1701 et seq., requires the Secretary of the Interior to retain and maintain public lands in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric water resource, and archeological values [Section 1701(a)(8)]; the Secretary, with respect to the public lands, shall promulgate rules and regulations to carry out the purposes of this Act and of other laws applicable to public lands [Section 1740].
- 48 Federal Register 44739-44738, 190; September 30, 1983: Federal Guidelines for Historic Preservation Projects: The US Secretary of the Interior has published a set of Standards and Guidelines for Archaeology and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archaeological and historical properties. The Secretary's standards and guidelines are used by federal agencies, such as the Forest Service, the Bureau of Land Management, and the National Park Service. The State Historic Preservation Office refers to these standards in its requirements for selection of qualified personnel and in the mitigation of potential impacts to cultural resources on public lands in California.
- National Historic Preservation Act 16 USC 470, commonly referred to as Section 106, requires federal agencies to take into account the effects of their undertakings on historic properties through consultations beginning at the early stages of project planning. Regulations revised in 1997 (36 CFR Part 800 et sec.) set forth procedures to be followed for determining eligibility for nomination, the nomination, and the listing of cultural resources in the National Register of Historic Places (NRHP). The eligibility criteria and the process are used by federal, state and local agencies in the evaluation of the significance of cultural resources. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the State Register of Historic Resources. Recent revisions to Section 106 in 1999 have emphasized the importance of Native American consultation.

- Executive Order 11593, Protection of the Cultural Environment, May 13, 1971 (36 Federal Register 8921) orders the protection and enhancement of the cultural environment by providing leadership, establishing state offices of historic preservation, and developing criteria for assessing resource values.
- American Indian Religious Freedom Act: Title 42 USC 1996 protects Native American religious practices, ethnic heritage sites, and land uses.
- Native American Graves Protection and Repatriation Act (1990): Title 25, USC, Section 3001, et seq. defines cultural items, sacred objects, and objects of cultural patrimony; establishes an ownership hierarchy; provides for review; allows excavation of human remains, but stipulates return of the remains according to ownership; sets penalties; calls for inventories; and provides for return of specified cultural items.

STATE

- Public Resources Code, section 5020.1 defines several terms, including the following:

(j) Historical resource includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.

(q) Substantial adverse change means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.

- Public Resources Code, section 5024.1 establishes the California Register of Historical Resources; sets forth criteria to determine significance; defines eligible properties; and lists nomination procedures. The criteria are essentially the same as for eligibility to the NRHP, but stipulate that some properties which may not retain sufficient integrity to meet NRHP standards, may still be eligible for the California Register.
- Title 14, California Code of Regulations, section 4852(c) explains that a resource that has lost its historic character or appearance may still have sufficient integrity for the California Register.
- Public Resources Code, section 5097.5 states that any unauthorized removal or destruction of archaeological or paleontologic resources on sites located on public land is a misdemeanor. As used in this section, public lands means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority or public corporation, or any agency thereof.
- Public Resources Code, section 5097.98 defines procedures for notification of discovery of Native American artifacts or remains and for the disposition of such materials.

- Public Resources Code, section 5097.99 prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and sets penalties for these actions.
- Public Resources Code, section 5097.991 states that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated.
- Public Resources Code, section 21000: et seq., California Environmental Quality Act (CEQA). This act requires the analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.
- Title 14, California Code of Regulations, section 15064.5 states that the lead agency determines whether a project may have a significant effect on important archaeological resources; if so, an EIR shall address these resources. If a potential for damage to significant archaeological resources can be demonstrated, such resources must be avoided, if they can not be avoided, mitigation measures shall be required. If a resource is found to be a historical resource, Public Resources Code 21083.2 does not apply and the criterion as unique is now replaced by the standards for eligibility to the California Register.
- Public Resources Code, Section 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial adverse change in the significance of a historic resource; the section further defines a historic resource and describes what constitutes a significant historic resource.
- CEQA Guidelines, Title 14, California Code of Regulations, section 15126.4, Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects, Subsection (b) Mitigation Measures Related to Impacts on Historical Resources : Subsection (b) discusses impacts of maintenance, repair, stabilization, restoration, conservation, or reconstruction of a historical resource. Subsection (b) discusses mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place; alternatives include documentation or data recovery by scientific excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.
- CEQA Guidelines, Title 14, California Code of Regulations, section 15064.5, Determining the Significance of Impacts to Archaeological and Historical Resources : Subsection (a) defines the term historical resources. Subsection (b) explains when a project may be deemed to have a significant effect on historic resources and defines terms used in describing those situations. Subsection (c) describes CEQA s applicability to archaeological sites and provides a bridge between the application of the terms historic resources and archaeological resources.
- CEQA Guidelines, Title 14, California Code of Regulations, section 15064.7, Thresholds of Significance : This section encourages agencies to develop thresholds of significance to be used in determining potential impacts and defines the term cumulatively significant.

- CEQA Guidelines, Appendix G : Issue V: Cultural Resources. Lists four questions to be answered in determining the potential for a project to impact archaeological, historical, and paleontological resources.
- California Penal Code, section 622.5: Anyone who willfully damages an object or thing of archaeological or historic interest can be found guilty of a misdemeanor.
- California Health and Safety Code, Section 7050.5: If human remains are discovered during earth disturbing activities or construction, the project owner is required to contact the county coroner.
- Public Resources Code, section 5097.98: If the county coroner determines that the remains are Native American, the coroner is required to contact the Native American Heritage Commission, which is then required to determine the Most Likely Descendant to inspect the burial and to make recommendations for treatment or disposition of the remains and any associated burial items.

LOCAL

Although the Energy Commission has pre-emptive authority over local laws, it typically ensures compliance with local laws, ordinances, regulations, standards, plans, and policies. The project site and associated linear facilities are all located within unincorporated portions of western Kern County.

KERN COUNTY

General provisions of the Kern County General Plan of 1994 require maintenance of a County inventory of areas with potential cultural and archaeological significance (EHPP 1999a, page 6-35).

FACILITY DESIGN

The applicable Laws, Ordinances, Regulations, and Standards (LORS) for each engineering discipline, civil, structural, mechanical and electrical, are included as part of the engineering appendices, Appendices A through H, and summarized in Section 6.0, Engineering (EHPP 1999a), of the Application for Certification. A summary of these LORS includes: Title 24, California Code of Regulations, which adopts the current edition of the California Building Code (CBC) as minimum legal building standards; the 1998 CBC for design of structures; American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code; and National Electrical Manufacturers Association (NEMA) standards.

GEOLOGY AND PALEONTOLOGICAL RESOURCES

The applicable LORS are listed in the Application for Certification (AFC), in Sections 5.4, 5.5 and 5.17 (EHPP 1999a). A brief description of the LORS for geological hazards and resources, paleontological resources, and drainage and erosion control follows:

FEDERAL

There are no federal LORS for geological hazards and resources, or grading and erosion control. The United States Bureau of Land Management (BLM) requires an excavation permit for excavations and grading on land under their jurisdiction. The Elk Hills Power Project power plant is not located on lands under the jurisdiction of the BLM. An excavation permit from BLM will be required since water supply pipeline route from mile post 8.6 to mile post 9.1 crosses land under the jurisdiction of the BLM (EHPP 1999a, page 5.7-18). Federal Land Planning Management Act (FLPMA) and NEPA also apply.

STATE AND LOCAL

The California Building Code (CBC) 1998 edition is based upon the Uniform Building Code (UBC), 1997 edition, which was published by the International Conference of Building Officials. The CBC is a series of standards that are used in the investigation, design (Chapters 16 and 18) and construction (including grading and erosion control as found in Appendix Chapter 33) that were based upon the UBC that includes supplemental standards specific to California. The CBC has been adopted by the Kern County Building and Services Department and supplements their grading and construction ordinances and regulations.

The California Environmental Quality Act (CEQA) Guidelines Appendix G provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.

Sections (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geological hazards.

Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

The Standard Procedures, Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources (Society of Vertebrate Paleontology) are a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. They were adopted in October 1994 by a national organization of vertebrate paleontologists (the Society of Vertebrate Paleontologists).

Kern County Development Standards (dated August 1995) Division Four Section 401-1 (Standards for Drainage) and Division Eight, Sections 408-1 and 408-2 (Retention Basin Volume and Hydraulic Design) apply to the site.

HAZARDOUS MATERIALS MANAGEMENT

FEDERAL

The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III and Clean Air Act of 1990 established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The Acts (codified in 40 C.F.R., section 68.115, part F) require the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of these Acts are reflected in the California Health and Safety Code, section 25531 et seq.

STATE

The California Health and Safety Code, section 25534 directs facility owners, storing or handling acutely hazardous materials in reportable quantities, to develop a Risk Management Plan (RMP) and submit it to appropriate local authorities, the United States Environmental Protection Agency (EPA), and the designated local Administering Agency for review and approval. The plan must include an evaluation of the potential impacts associated with an accidental release, the likelihood of an accidental release occurring, the magnitude of potential human exposure, any preexisting evaluations or studies of the material, the likelihood of the substance being handled in the manner indicated, and the accident history of the material. This new, recently developed program supersedes the California Risk Management and Prevention Plan (RMPP).

Title 8, the California Code of Regulations, section 5189 requires facility owners to develop and implement effective safety management plans to insure 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 RMP process.

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.

LOCAL AND REGIONAL

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials. These provisions are contained in Articles 79 and 80. The latest revision to Article 80 was in 1999 (UFC 1999). These articles contain minimum setback requirements for outdoor storage of ammonia.

The California Building Code contains requirements regarding the storage and handling of hazardous materials. The Chief Building Official must inspect and verify compliance with these requirements prior to issuance of an occupancy permit.

LAND USE

KERN COUNTY GENERAL PLAN

The general plan is the legal document that acts as a constitution for land use and development in Kern County. It consists of the seven mandatory elements: land use, circulation, open space, conservation, housing, safety and seismic safety, and noise; and four optional elements: recreation, energy, hazardous waste management, and public services and facilities (Kern County 1994). The following land use designations of the Kern County General Plan are specific to the proposed project.

LAND USE DESIGNATIONS

NONJURISDICTIONAL LAND

State and Federal Land - All property under the ownership and control of various state and federal agencies.

RESOURCE

Intensive Agriculture

Applies to areas devoted to the production of irrigated crops or having the potential for such use. Other agricultural uses may be consistent with the intensive agriculture designation. Minimum parcel size is 20 acres gross. Permitted uses include, but are not limited to:

- Primary: irrigated cropland, orchards, vineyards, ranch and farm facilities, etc.; one single-family dwelling unit.
- Compatible: livestock grazing, water storage, mineral and petroleum exploration and extraction, and public utility uses, etc., pursuant to provisions of the Zoning Ordinance.

Extensive Agriculture

Applies to agricultural uses involving large amounts of land with relatively low value-per-acre yields. Minimum parcel size is 20 acres gross, except lands not under Williamson Act Contract, in which case the minimum parcel size shall be 80 acres gross. Permitted uses include, but are not limited to:

- Primary: livestock grazing, dry land farming, ranching facilities, wildlife and botanical preserves, timber harvesting, etc.; one single-family dwelling unit.
- Compatible: irrigated croplands, water storage or ground water extraction, recharge areas, mineral and petroleum exploration, recreational activities, etc.

Mineral And Petroleum

Applies to areas, which contain producing, or potentially productive, petroleum fields and mineral deposits. Uses are limited to activities directly associated with resource extraction. Minimum parcel size is 5 acres gross. Permitted uses include, but are not limited to:

- Primary: mineral and petroleum exploration and extraction.
- Compatible: extensive and intensive agriculture, mineral and petroleum processing, pipelines, power transmission facilities, communication facilities, equipment storage yards, and one single-family dwelling unit (subject to a Conditional Use Permit).

PUBLIC FACILITIES

Applies to areas designated for basic physical structures and infrastructure including roads, water distribution and large storage systems, sewage collection and treatment facilities, and flood control and storm drainage systems.

PHYSICAL CONSTRAINTS

Includes overlay zones denoting physical constraints. Those applicable include:

- Steep Slopes: Land with an average slope of 30 percent or steeper.
- Flood Hazard: Based on the Flood Hazard Boundary Maps of the US Department of Housing and Urban Development and the Kern County Water Agency. These areas include, for example, flood channels and watercourses, riverbeds, and gullies. Development within these areas is subject to review by the County and will include conformity with adopted ordinances.

SPECIAL TREATMENT AREAS

These are areas for which area-wide land use plans have been prepared or approved. They include both Accepted County Plan Areas and Rural Community plans:

- Accepted County Plan Areas: Specific land use areas for which plans have been prepared and approved.
- Rural Community: Settlements in the County that have individual character and are recognized as unique communities meriting Specific Plan level of detail.

INDUSTRIAL

Commercial and industrial activities which involve outdoor storage or use of heavy equipment which produces significant air or noise pollution.

The following tables indicate the Kern County General Plan land use designations and existing land uses of the proposed project and transmission line corridors.

GENERAL PLAN LAND USE DESIGNATIONS WITHIN THE STUDY AREA

LAND USE Table 1

Location or Linear Facility	Land Use Designation
Elk Hills Power Plant	Mineral and Petroleum
Transmission Line Route 1A	Mineral and Petroleum/Special Treatment Areas/Mineral and Petroleum-Flood Hazard
Transmission Line Route 1B and 1B Variation	Mineral and Petroleum/Extensive Agricultural/Intensive Agricultural
Water Supply Line Route 2	Mineral and Petroleum/Non-Jurisdictional Land/Extensive Agricultural/ Mineral and Petroleum-Flood Hazard/Public Facilities-Flood Hazard
Wastewater Supply Line Route 3	Mineral and Petroleum
Natural Gas Supply Line Route 4	Extensive Agricultural/Mineral and Petroleum

EXISTING LAND USES WITHIN THE STUDY AREA

LAND USE Table 2

Location or Linear Facility	Existing Land Uses
Elk Hills Power Plant	Oil and Gas Production
Transmission Line Route 1A	Oil and Gas Production/Undeveloped/School/Church/Residential
Transmission Line Route 1B and 1B Variation	Commercial/Oil and Gas Production/Conservation/Undeveloped/Agricultural/Rural Residences
Water Supply Line Route 2	Oil and Gas Production/Undeveloped/West Kern Water District Distribution Center
Wastewater Supply Line Route 3	Oil and Gas Production
Natural Gas Supply Line Route 4	Oil and Gas Production

LAND USE PLANS AND POLICIES RELATED TO EHPP

The following provisions of the Kern County General Plan, McKittrick Rural Community Plan, Buttonwillow Community Development Plan, U.S. Fish and Wildlife Service, and Caliente Resource Management Plan are specific to the proposed project.

Nonjurisdictional Land

- Coordination and cooperation will be promoted among the County, the incorporated cities and the various special districts where their planning decisions and actions affect more than a single jurisdiction (Policy No. 1).
- Land under state and federal jurisdiction will be considered as land designated for Resource Management on the General Plan map (Policy No. 4).

Physical Constraints

- Kern County will not permit new developments to be sited on land that is environmentally unsound to support such development (Policy No. 1).
- Development will not be allowed in natural hazard areas pending the adoption of ordinances that establish conditions, criteria and standards in order to minimize risk to life and property posed by those risks (Policy No. 2).
- Zoning and other land use controls will be used to regulate and, in some instances, to prohibit development in hazardous areas (Policy No. 3).
- New development will not be permitted in areas of landslide or slope instability as designated in the Safety and Seismic Safety Element of the General Plan, and as mapped on the Kern County Seismic Hazard Atlas (Policy No. 6).
- Regardless of percentage of slope, development on hillsides will be sited in the least obtrusive fashion, thereby minimizing the extent of topographic alteration required (Nonjurisdictional Land - Policy No. 1, p. 1 - Policy No. 9)
- Development proposed in areas with steep slopes will be reviewed for conformity to the adopted Hillside Development Ordinance to ensure that appropriate stability, drainage, and sewage treatment will result (Policy No. 10).
- Designated flood channels and watercourses, such as creeks, gullies, and riverbeds will be preserved as resource management areas or, in the case of the urban areas, as linear parks (Policy No. 12).
- New development will be required to demonstrate the availability of adequate fire protection and suppression facilities (Policy No. 13).
- Kern County will evaluate the potential noise impacts of any development-siting action or of any applications it acts upon that could significantly alter noise levels in the community and will require mitigative measures where significant adverse effects are identified (Policy No. 14).
- The air quality effects of a proposed land use will be considered when evaluating development proposals (Physical Constraints - Policy No. 15, p. 2-3).
- Kern County will disapprove projects found to have significant adverse effects on Kern County's air quality, unless the Board of Supervisors, Board of Zoning Adjustment, or the Director of Planning and Development Services, acting as Hearing Officer or Parcel Map Advisory Agency makes findings under CEQA (Policy No. 16).

Special Treatment Areas

- In areas designated Specific Plan Required with more than one owner, the interim designations will reflect the existing zoning pattern until the County prepares and adopts a Specific Plan (Policy 3(b)).

Resource

- Areas designated agricultural use, which include Class I and II agricultural soils with surface water delivery systems will be protected against residential and commercial subdivision and development activities (Policy No. 1).
- Areas identified by the Soil Conservation Service as having high range-site value will be reserved for extensive agricultural use or as resource reserves if located within a County water district (Policy No. 2).
- In areas with a Resource designation on the General Plan map, only industrial activities which directly and obviously relate to the exploration, production, and transportation of the particular resource will be considered to be consistent with this plan (Policy No. 4).
- Development will be constrained, pending adoption of ordinances, which establish conditions, criteria, and standards, in areas containing valuable resources in order to protect the access to and economic use of these resources (Policy No. 9).
- Rivers and streams in the County are important visual and recreational resources and wildlife habitats. Areas of riparian vegetation along rivers and streams will therefore be preserved when feasible to do so (Policy No. 11).
- The County will maintain and enhance air quality for the health and well being of County residents by encouraging land uses which promote air quality and good visibility (Policy No. 13).
- Habitats of threatened or endangered species should be protected to the greatest extent possible (Policy No. 14).
- Management which are presently under Williamson Act Contracts will have a minimum parcel size of 80 acres until such time as a contract expires or is canceled, at which time the minimum parcel size will become 20 acres (Policy No. 15).

General Provisions

- Prior to issuance of any development or use permit, the County shall make the finding, based on information provided by California Environmental Quality Act (CEQA) documents, staff analysis, and the applicant, that adequate public or private services and resources are available to serve the proposed development. The developer shall assume full responsibility for costs incurred in service extensions or improvements that are required as a result of the proposed project (Policy No. 3).

- The air quality implications of new development will be considered in approval of major developments or area wide land use designations (Policy No. 15).
- The County will promote the preservation of designated historic buildings and the protection of cultural resources which provide ties with the past and constitute a heritage value to residents and visitors (Policy No. 16).
- Maintain the County s inventory of areas of potential cultural and archaeological significance (Implementation G).

McKittrick Rural Community Plan

The McKittrick Rural Community Plan has been developed using the criteria, goals, policies, and implementing ordinances of the Kern County General Plan. Programs and document framework for the McKittrick Plan are the same as those used in the Kern County General Plan.

Buttonwillow Community Development Plan

Open Space

- Encourage continuing dual use of transmission line easements as open space or possibly greenbelt areas (Implementation P. 23).
- Continuance of land use contracts under the provisions of the Williamson Act and maintenance of the A (Exclusive Agricultural) zoning classification for agricultural lands (Implementation, P. 25).
- Encourage continuance of land use contracts under the provisions of the California Land Conservation Act of 1965, as amended, and commonly referred to as The Williamson Act (Implementation, P. 30).

Fish And Wildlife

- Encourage programs to locate and determine populations of rare and endangered species (Implementation, P. 85).

BLM - Caliente Resource Management Plan

Resource Policy and Management Guidance

- All lands in the resource area are available for cooperative management agreements with local governments and/or private organizations, provided that proposed management conforms to plan objectives and land use allocations (Policy No. 14).
- BLM shall not jeopardize the continued existence of any plant or animal that is listed as threatened or endangered by the federal or state government, or is either proposed for listing or is a candidate for listing by the federal government (Policy No. 19).
- Efforts to avoid adverse effects to cultural resources will be implemented (Policy No. 26).

- Proposals for future development activities will require additional NEPA analysis (Policy No. 27).
- Protection of paleontological resources will include the assessment of the threat to these resources, along with the implementation of measures designed to mitigate these impacts (Policy No. 27).
- The authorized office may approve the use of motor vehicles on any public lands in the resource area (Policy No. 40).

Resource Guidance And Decisions

- Improve the management efficiency of federal lands, improve resources protection and provide lands for public and private uses through land tenure adjustment (Objective No. 5).
- Accommodate requests for land use authorizations while minimizing residual impacts to sensitive resources (Objective No. 6).
- Manage public lands to enhance, protect and minimize impacts to sensitive resources, including cultural and paleontological resources; and air and water quality (Objective No. 10).

Resource Area-Wide Allocations

- Unless otherwise identified, all public lands shall be retained in federal ownership (Allocation No. 1).
- Lands where BLM manages the mineral estate only (split estate lands) will be available for exchange through Section 206 of the Federal Land Policy Management Act (FLPMA), on a case by case basis (Allocation No. 6).
- Management Action shall conform to Visual Resource Management (VRM) classifications (Allocation No. 22).
- Activities on public land, including construction, road maintenance and improvement, oil development, pipeline corridors, and powerline corridors must comply with local Air Pollution Control District requirements (Allocation No. 29).

Lokern Area of Critical Environmental Concern (ACEC)

- Cooperative of local landowners and local, state, and federal government agencies to manage the Lokern ACEC as a natural ecosystem for the benefit of threatened and endangered species and their habitats, while recognizing the rights and needs of authorized users of public land.

Management Prescriptions

- This ACEC is open for leasing of oil, gas, and geothermal resources subject to the following stipulation: LSU-Protected Species, LSU-Sensitive Species.

Public Facilities

- In evaluating a development application, Kern County will consider impacts on the local school district(s) (Policy No. 8).
- A large part of the short-term threat to public health and local government resources is due to transportation of hazardous waste (as well as hazardous material in general). Disposal capacity will be permitted for waste streams which minimize the volume and distance of transportation (Policy No. 13).
- All generators and processors of hazardous waste are encouraged to develop long-term waste management programs. Large generators of hazardous waste should be encouraged to recycle, treat and detoxify their wastes on site. Many such processes could be implemented in existing industrial map designations, if zoned appropriately (Policy No. 17).
- Include consideration of fiscal impacts of development proposals, so that the character and extent of possible public service or facility deficiencies can be identified during the course of the normal project review process (Implementation B).
- Determine the local cost of facility and infrastructure improvements and expansion which are necessitated by new development of any type and prepare a schedule of charges to be levied on the developer at the time of approval of the Final Map (Implementation E).
- Ensure that the Superintendent of Schools and the respective school boards are informed of development proposals and are afforded the opportunity of evaluating their potential effect on the physical capacity of school facilities and their fiscal impact on locally originating revenue requirements. Their reports on these impacts should be available on a timely fashion prior to final consideration and action by Kern County on a development application (Implementation J).
- Roads and highways utilized for commercial shipping of hazardous waste destined for disposal will be designated as such pursuant to Vehicle Code Sections 31030 et seq. Permit applications shall identify the commercial shipping routes they propose to utilize for particular waste streams (Implementation O).

Energy Element of the Kern County General Plan

- The County shall encourage the development and upgrading of transmission lines and associated facilities (e.g., substations) as needed to serve Kern County's residents and access the County's generating resources, insofar as transmission lines do not create significant environmental or public health and safety hazards (Policy No. 1).
- The County shall review proposed transmission lines and their alignments for conformity with the Land Use Element of the Kern County General Plan (Policy No. 2).

- In reviewing proposals for new transmission lines and/or capacity, the County shall assert a preference for upgrade of existing lines and use of existing corridors where feasible (Policy No. 3).
- The County shall work with other agencies in establishing routes for proposed transmission lines (Policy No. 4).
- The County shall discourage the siting of above ground transmission lines in visually sensitive areas (Policy No. 5).
- The County should encourage new transmission lines to be sited/configured to avoid or minimize collision and electrocution hazards to raptors (Policy No. 6).
- The County should monitor the supply and demand of electrical transmission capacity locally and statewide (Implementation A).
- The County shall continue to maintain provisions in the Zoning Ordinance and update as necessary to provide for transmission line development (Implementation B).

KERN COUNTY ZONING CODE

The Kern County Zoning Ordinance was adopted in July 1997. The ordinance implements the Kern County General Plan by applying development standards and construction requirements on land as it is developed within the unincorporated areas of the county. The following sections of the Kern County Zoning Ordinance apply to the project: Section 19.80.30 of Chapter 19.80 (Special Development Standards — Commercial and Industrial Districts); Sections 19.82.030 and 19.82.090 of Chapter 19.82 (Offstreet Parking - Design and Development Standards); and Section 19.86.060 of Chapter 19.86 (Landscaping Standards — Industrial Uses). The following divisions of the Kern County Zoning Ordinance apply to the project.

Zoning Designations Within The Affected Environment

Location or Linear Facility	Zoning Designations
Elk Hills Power Plant	Location or Linear Facility
Transmission Line Route 1A	Limited Agriculture (A-1), Limited Agriculture (A-1), Estate (E-20, E-10), Low Density Residential Mobile Home (R1-M H), General Commercial (C-2)
Transmission Line Route 1B and 1B Variation	Limited Agriculture (A-1), Exclusive Agriculture (A), Airport Approach Height Combining (H)
Water Supply Line Route 2	Limited Agriculture (A-1), Exclusive Agriculture (A)
Wastewater Supply Line Route 3	Limited Agriculture (A-1), Exclusive Agriculture (A)
Natural Gas Supply Line Route 4	Limited Agriculture (A-1)

NEED CONFORMANCE

Prior to January 1, 2000, the Public Resources Code prohibited the Energy Commission from certifying a power plant unless the Commission made a finding that the facility was found to be in conformance with the Commission's integrated assessment of the need for new resource additions. (Pub. Resources Code // 25523(f) and 25524(a).) The Public Resources Code directed the Commission to do an integrated assessment of need, taking into account 5- and 12-year forecasts of electricity supply and demand, as well as various competing interests, and to adopt the assessment in a biennial electricity report.

On September 28, 1999, the Governor signed Senate Bill No. 110, which became Chapter 581, Statutes of 1999. This legislation repealed Public Resources Code sections 25523(f) and 25524(a) and amended other provisions relating to the assessment of need for new resources. It removed the requirement that the Commission make a specific finding that the proposed facility is in conformance with the adopted integrated assessment of need. Regarding need-determination, Senate Bill 110 states:

Before the California electricity industry was restructured the regulated cost recovery framework for power plants justified requiring the commission to determine the need for new generation, and site only power plants for which need was established. Now that power plant owners are at risk to recover their investments, it is no longer appropriate to make this determination.

(Pub. Resources Code, /25009, added by Stats. 1999, ch. 581, /1.) Senate Bill 110 takes effect on January 1, 2000 (Cal. Const. Art. 4, /8.). As of January 1, 2000, the Commission is no longer required to determine if a proposed project conforms with an integrated assessment of need. As a result, an application for certification for which the Commission adopts a final decision after January 1, 2000, is not subject to a finding of need-conformance.

NOISE

FEDERAL

Under the Occupational Safety and Health Act of 1970 (29 USC / 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 CFR / 1910.95) that establish maximum noise levels to which workers at a facility may be exposed. These OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time during which the worker is exposed. OSHA regulations also dictate hearing conservation program requirements and workplace noise monitoring requirements. The administering agency for the above authority is the Federal Occupational Safety and Health Administration (Fed-OSHA).

Noise Control Act of 1972 42 USC 6 4901 et seq. 40 CFR Parts 201-211. This Act sets performance standards for noise emissions from "major sources." The Environmental Protection Agency (EPA) has identified a day/night level (Ldn) of 55°dBA as providing reasonable protection against community annoyance and activity interference due to noise. The Noise Control Act is administered by EPA.

There are no federal laws governing off-site (community) noise.

STATE

Similarly, there are no state regulations governing off-site (community) noise. Rather, state planning law (Gov. Code, / 65300) requires that all counties and cities prepare and adopt a General Plan. Government Code section 65302(f) requires that a noise element be prepared as part of the General Plan. This element is to address existing and foreseeable noise problems. Other state laws, ordinances, regulations and standards (LORS) include the California Environmental Quality Act (CEQA) and the California Occupational Safety and Health Act (Cal-OSHA).

California Vehicle Code, sections 23130 and 23130.5, sets noise limits for highway vehicles. The California Highway Patrol and the Kern County Sheriff s Office administer the vehicle code.

CAL-OSHA

California Occupational Safety and Health Administration (Cal-OSHA) has promulgated Occupational Noise Exposure Regulations that set employee noise exposure limits.

Cal-OSHA regulations (Cal. Code Regs., tit. 8, and / 5095 et seq.) are the same as the federal OSHA criteria described above. The criteria are based on a worker's noise level exposure over a specific time period. Maximum permissible worker noise exposure levels to protect against damage to the workers' hearing have been established. The administering agency is Cal-OSHA.

CEQA

California Environmental Quality Act (CEQA) requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. The applicable CEQA Guidelines (Cal. Code Regs., tit. 14, /15000 et seq., Appendix G/XI) explain that a significant effect from noise may exist if a project would result in:

1. Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
2. Exposure of persons to, or generation of, excessive ground borne vibration or ground borne noise levels.
3. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
4. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

LOCAL

KERN COUNTY GENERAL PLAN - NOISE ELEMENT

The Kern County General Plan 1989 contains a Noise Element that establishes environmental noise limits based on the land use of the property receiving the noise. The permissible noise levels are outlined below. The administering agency for the above authority is the Kern County Department of Planning and Development Services.

These standards limit L₅₀ or median noise levels during the day to 50 dBA, and at night to 40 dBA at highly noise-sensitive locations such as isolated rural residences.

**NOISE: Table 1
Kern County General Plan-Noise Element**

Land Use Category	Maximum Permissible Sound Level		
	L ₅₀ (Day)	L ₅₀ (Night)	CNEL
Non-sensitive Land Uses	65	60	75
Moderately Sensitive Land Uses	60	55	70
Sensitive Land Uses	55	45	65
Highly Sensitive Land Uses	50	40	60

POWER PLANT EFFICIENCY

FEDERAL

No federal laws apply to the efficiency of this project.

STATE

CALIFORNIA ENVIRONMENTAL QUALITY ACT GUIDELINES

CEQA Guidelines state that the environmental analysis shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy (Cal. Code Regs., tit. 14, /15126.4(a)(1)). Appendix F of the Guidelines further suggests consideration of such factors as the project's energy requirements and energy use efficiency; its effects on local and regional energy supplies and energy resources; its requirements for additional energy supply capacity; its compliance with existing energy standards; and any alternatives that could reduce wasteful, inefficient and unnecessary consumption of energy (Cal. Code regs., tit. 14, /15000 et seq., Appendix F).

LOCAL

No local or county ordinances apply to power plant efficiency.

POWER PLANT RELIABILITY

Presently, there are no laws, ordinances, regulations or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the commission must make findings as to the manner in which the project is to be designed, sited and operated to ensure safe and reliable operation [Cal. Code Regs., tit. 20, / 1752(c)].

PUBLIC HEALTH

FEDERAL

The Clean Air Act of 1970 (42 U.S.C., section 7401 et seq.) required establishment of ambient air quality standards to protect the public from the effects of air pollutants. These standards have been established by the United States Environmental Protection Agency (EPA) for the major air pollutants: nitrogen dioxide, ozone, sulfur dioxide, carbon monoxide, sulfates, particulate matter with a diameter of 10 micron or less (PM10) and lead. The Act required states to adopt plans to ensure compliance by 1982.

STATE

California Health and Safety Code section 39606 requires the California Air Resources Board (CARB) to establish California's ambient air quality standards to reflect the California-specific conditions that influence its air quality. Such standards have been established by the CARB for ozone, carbon monoxide, sulfur dioxide, PM10, lead, hydrogen sulfide, vinyl chloride and nitrogen dioxide. The same biological mechanisms underlie some of the health effects of most of these criteria pollutants as well as the noncriteria pollutants.

California Health and Safety Code section 41700 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 business or property.

The California Health and Safety Code section 39650 et seq. mandates that the California Environmental Protection Agency (Cal-EPA) establish safe exposure limits for toxic, noncriteria air pollutants and identify the best available methods for their control. These laws also require that the new source review rules for each air district include regulations establishing procedures to control the emission of these pollutants.

California Health and Safety Code section 44300 et seq. requires facilities, which emit large quantities of criteria pollutants and any amount of noncriteria pollutants to provide the local air district an inventory of toxic emissions. Such facilities may also be required to prepare a quantitative health risk assessment to address the potential health risks involved. The CARB and the San Joaquin Valley Air Quality Management District (SJVUAPCD) will ensure implementation of these requirements for the proposed project.

LOCAL

The San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) has no specific rules implementing Health and Safety Code section 44300. It does, however, require the results of a health risk assessment as part of the application for the Authority to Construct (ATC). The EHPP has complied with this requirement.

SOCIOECONOMICS

FEDERAL

Executive Order 12898, Federal Actions to address Environmental Justice (EJ) in Minority Populations and Low-Income Populations. The order focuses federal attention on the environment and human health conditions of minority communities and directs agencies to achieve environmental justice as part of this mission. The Executive Order requires the US Environmental Protection Agency (EPA) and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this problem. Agencies are required to identify and address any disproportionately high and/or adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations. The Energy Commission receives federal funds and is thus subject to this Executive Order.

STATE

CALIFORNIA GOVERNMENT CODE, SECTION 65996-65997

As amended by SB 50 (Stats. 1998, ch. 407, Sec. 23), states that public agencies may not impose fees, charges or other financial requirements to offset the cost for school facilities.

LOCAL

KERN COUNTY GENERAL PLAN

Public facilities component pertinent to Socioeconomics.

(Policy No. 8) In evaluating a development application, Kern County will consider impacts on the local school districts.

(Implementation E) Determine the local cost of facility and infrastructure improvements and expansion which are necessitated by new development of any type and prepare a schedule of charges to be levied on the developer at the time of approval of the Final Map.

TRAFFIC AND TRANSPORTATION

FEDERAL

The federal government addresses transportation of goods and materials in Title 49, Code of Federal Regulations:

- Title 49, Code of Federal Regulations, sections 171-177, governs the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles.
- Title 49, Code of Federal Regulations, sections 350-399, and Appendices A-G, Federal Motor Carrier Regulations, addresses safety considerations for the transport of goods, materials and substances over public highways.

STATE

The California Vehicle Code and the Streets and Highways Code contain requirements applicable to the licensing of drivers and vehicles, the transportation of hazardous materials and right-of-way. In addition, the California Health and Safety Code addresses the transportation of hazardous materials. Specifically, these codes include:

- California Vehicle Code, section 353 defines hazardous materials.
- California Vehicle Code, sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- California Vehicle Code, section 31030, requires that permit applications shall identify the commercial shipping routes they propose to utilize for particular waste streams.
- California Vehicle Code, sections 31600-31620, regulates the transportation of explosive materials.
- California Vehicle Code, sections 32000-32053, regulates the licensing of carriers of hazardous materials and includes noticing requirements.
- California Vehicle Code, sections 32100-32109, establishes special requirements for the transportation of inhalation hazards and poisonous gases.
- California Vehicle Code, sections 34000-34121, establishes special requirements for the transportation of flammable and combustible liquids over public roads and highways.
- California Vehicle Code, sections 34500, 34501, 34501.2, 34501.4, 34501.10, 34505.5-7, 34507.5 and 34510-11, regulate the safe operation of vehicles, including those which are used for the transportation of hazardous materials.
- California Vehicle Code, sections 2500-2505, authorize the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives.

- California Vehicle Code, sections 13369, 15275, and 15278, address the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, it requires the possession of certificates permitting the operation of vehicles transporting hazardous materials.
- California Streets and Highways Code, sections 117 and 660-72, and California Vehicle Code 35780 et seq., require permits for the transportation of oversized loads on county roads.
- California Streets and Highways Code, sections 660, 670, 1450, 1460 et seq., 1470, and 1480, regulate right-of-way encroachment and the granting of permits for the encroachment on state and county roads.
- California Health and Safety Code, sections 25160 et seq., address the safe transport of hazardous materials.

LOCAL

KERN COUNTY

The Circulation Element of the Kern County General Plan sets up local goals and guiding policies about building transportation improvements. It introduces planning tools essential for achieving the local transportation goals and policies (Kern County, 1992). Relevant goals and policies include, in part, the following:

PRIVATE DEVELOPMENT ACCESS TO EXISTING ROADWAY NETWORK

As a condition of private development approval, developers shall build roads needed to access the existing road network. Developers shall build these roads to County standards (Policy No. 1).

GROWTH BEYOND 2010

The County should monitor traffic volumes and patterns on County major highways (Policy No. 1).

Development applications must demonstrate that sufficient transportation capacity is available to serve the proposed project at Level of Service D (LOS D) or better (Policy No. 2).

TRUCKS ON HIGHWAYS

Make the California Department of Transportation (Caltrans) aware of heavy truck activity on Kern County's roads (Policy No. 1).

Start a program that monitors truck traffic operations (Policy No. 2).

Promote a monitoring program of truck lane pavement condition (Policy No. 3).

TRUCK ROUTES

The County's Transportation Management Department should oversee truck travel patterns and be aware of locations where heavy trucks traverse residential areas (Policy No. 1).

TRANSPORTATION OF HAZARDOUS MATERIALS

State maintained highways are acceptable as commercial hazardous waste transportation routes (Policy No. 1).

Kern County and affected cities should reduce use of County maintained roads and city maintained streets for transportation of hazardous materials (Policy No. 3).

Restrict commercial transportation of hazardous materials in accordance with Vehicle Code section 31303. The Circulation Element charts routes where commercial hazardous materials shipments can go (Policy No. 4).

TRANSMISSION LINE SAFETY AND NUISANCE

FEDERAL

AVIATION SAFETY

Any hazard to area aircraft relates to the potential for collision with the line in the navigable air space. The applicable LORS are intended to ensure the distance and visibility necessary to avoid such collision.

- Title 14, Part 77 of the Federal Code of Regulations (CFR), Objects Affecting the Navigation Space . Provisions of these regulations specify the criteria used by the Federal Aviation Administration (FAA) for determining whether a Notice of Proposed Construction or Alteration is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved. Such notification allows the FAA to ensure that the structure is located to avoid any significant hazards to area aviation.
- FAA Advisory Circular (AC) No. 70/460-2H, Proposed Construction and or Alteration of Objects that may Affect the Navigation Space . This circular informs each proponent of a project that could pose an aviation hazard of the need to file the Notice of Proposed Construction or Alteration (Form 7640) with the FAA.
- FAA AC No. 70/460-1G, Obstruction Marking and Lighting . This circular 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

Transmission line-related radio-frequency interference is one of the indirect effects of line operation as produced by the physical interactions of line electric fields. The level of such interference usually depends on the magnitude of the electric fields involved. Because of this, the potential for such impacts could be assessed from field strength estimates obtained for the line. The following regulations are intended to ensure that such lines are located away from areas of potential interference and that any interference is mitigated whenever it occurs.

- Federal Communications Commission (FCC) regulations in 47 CFR 15.25. Provisions of these regulations prohibit operation of any devices producing force fields, which interfere with radio communications, even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. Such interference is due to the radio noise produced by the action of

the electric fields on the surface of the energized conductor. The process involved is known as corona discharge but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings. When generated, such noise manifests as perceivable interference with radio or television signal reception or interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. Staff usually recommends specific conditions of certification to ensure compliance with this FCC requirement. Since electric fields cannot penetrate the soil and other objects, underground lines do not produce the radio noise associated with overhead lines.

Several design and maintenance options are available for minimizing these electric field-related impacts. When incorporated in the line design and operation, such measures also serve to reduce the line-related audible noise discussed below.

STATE

- General Order 52 (GO-52), California Public Utilities Commission (CPUC). Provisions of this order govern the construction and operation of power and communications lines and specifically deal with measures to prevent or mitigate inductive interference. Such interference is produced by the electric field induced by the line in the antenna of a radio signal receiver.
- GO-128 Rules for Construction of Underground Electric Supply and Communications Systems . Provisions of this order establish requirements and minimum standards for the safe construction of underground AC power and communications circuits.

AUDIBLE NOISE

As with radio noise, any audible noise from a transmission line usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying or hissing sound or hum. Since (as with communications interference), the noise level depends on the strength of the line electric field, the potential for occurrence can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during wet weather and from lines of 345 kV or higher. It, therefore, is generally not expected at significant levels from lines of less than 345 kV. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a 100-ft right-of-way. There are no design-specific regulations to limit the audible noise from transmission lines. As with radio noise, such noise is limited instead through design and maintenance standards established from industry research

and experience as effective without significant impacts on line safety, efficiency maintainability and reliability.

FIRE HAZARDS

The fires addressed through the following regulations are those that could be caused by sparks from conductors of overhead lines or that could result from direct contact between the line and nearby trees.

- General Order 95 (GO-95), CPUC, Rules for Overhead Electric Line Construction . This order specifies tree-trimming criteria to minimize the potential for power line-related fires.
- Title 14 Section 1250 of the California Code of Regulations, Fire Prevention Standards for Electric Utilities . This code specifies utility-related measures for fire prevention.

HAZARDOUS SHOCKS

The hazardous shocks that are addressed by the following regulations and standards are those that could result from direct or indirect contact between an individual and the energized line. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines.

- GO-95, CPUC. Rules for Overhead Line Construction . These rules specify uniform statewide requirements for overhead line construction regarding ground clearance, grounding, maintenance and inspection. Implementing these requirements usually ensures the safety of the general public and utility and non-utility workers. Non-utility workers in this case would include workers engaged in oil field or gas pipeline-related activities.
- Title 8, CCR, Section 2700 et seq., High Voltage Electric Safety Orders . These safety orders establish essential requirements and minimum standards for safely installing, operating, and maintaining electrical installations and equipment. Compliance with the distancing and safety requirements in this order will prevent hazardous shocks among utility and non-utility workers working around utility and non-utility installations such as gas water and sewer lines, and oil wells.
- National Electrical Safety Code, (NESC) Part 2: Safety Rules for Overhead Lines. Provisions in this part of the code specify the national safe operating clearances applicable in areas where the line might be accessible to the public. Such requirements are intended to minimize the potential for direct or indirect contact with the energized line.

LOCAL

There are no local laws or regulations specifically aimed at the physical structure or dimensions of electric power lines to limit their obstruction or hazardous shock hazards,

or eliminate the interactive effects of their electric or magnetic fields. All the noted LORS are implemented industry wide to ensure that lines are uniformly constructed to reflect existing health and safety information while ensuring efficiency and reliability.

TRANSMISSION SYSTEM ENGINEERING

California Public Utilities Commission (CPUC) General Order 95 (GO-95), Rules for Overhead Electric Line Construction, formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance, operation or use of overhead electric lines and to the public in general.

- CPUC Rule 21 provides standards for the reliable connection of parallel generating stations connected to participating transmission owners.
- Western Systems Coordinating Council (WSCC) Reliability Criteria provides the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria includes the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 Criteria for Transmission System Contingency Performance which requires that the results of power flow and stability simulations verify established performance levels.

Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or facility loading outside emergency limits) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas. While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).

- North American Electric Reliability Council (NERC) Planning Standards provides policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions, however the NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).
- Cal-ISO Reliability Criteria also provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards.

However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid.

- Cal-ISO Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria. These standards will be applied to the assessment of the system reliability implications of the Elk Hills project. Also of major importance to the Elk Hills project, and other privately funded projects which may sell through the California Power Exchange (Cal-PX) are the Cal-ISO Day/Hour Ahead Inter-zonal Congestion Management Scheduling Protocol (SP 10), the Transmission System Loss Management Scheduling Protocol (SP 4), and the Creation of the Real Time Merit Order Stack (SP 11). The Congestion Management Scheduling Protocol provides that the operation of power plants not violate system criteria when market participants request generation dispatch or the use of major interties. The Real Time Merit Order Stack is developed based on increasing energy bid prices so that the least cost bids are accepted early on and if congestion is anticipated the highest bids are not selected. The Transmission System Loss Management Scheduling Protocol uses the Cal-ISO power flow model to identify total transmission losses at each generating unit and scheduling point. Additional calculations are performed to determine net power output required by the generating units to meet their scheduled obligations (Cal-ISO 1998a, Cal-ISO 1998b).
- Cal-ISO Participating Generator Agreement consists of detailed explanations of the requirements in the Cal-ISO Tariff pertaining to the paralleled generating unit.

VISUAL

FEDERAL AND STATE

The proposed project, including the linear facilities, is located on private lands and is thus not subject to federal land management requirements. Likewise, no roadway in the project vicinity is a designated or eligible State Scenic Highway. Therefore, no federal or state regulations pertaining to scenic resources are applicable to the project.

LOCAL

COUNTY OF KERN

GENERAL PLAN

Kern County has no specific policies on visual or aesthetic resources that apply to the Elk Hills project. However, these issues are addressed in the Kern County General Plan, Open Space Element, and are implemented by the Kern County Planning and Development Services Department (Kern County, 1994). This element of the General Plan requires public notification and review of any projects that may adversely impact visual resources. In accordance with Chapter 19.86 of the Kern County Zoning Code, the applicant is required to prepare a Landscape Plan when final construction drawings of the project are completed. The Elk Hills project is generally consistent with the land use designation for the area, and therefore is considered consistent with associated visual resource planning purposes and General Plan requirements.

WASTE MANAGEMENT

FEDERAL

RESOURCE CONSERVATION AND RECOVERY ACT (42 U.S.C. SEC.6921 ET SEQ.)

The Resource Conservation and Recovery Act establishes requirements for the management of hazardous wastes from the time of generation to the point of ultimate treatment or disposal. Section 6922 requires generators of hazardous waste to comply with requirements regarding:

- record keeping practices which identify quantities of hazardous wastes generated and their disposition,
- labeling practices and use of appropriate containers,
- use of a manifest system for transportation, and
- submission of periodic reports to the EPA or authorized state.

TITLE 40, CODE OF FEDERAL REGULATIONS, PART 260

These sections contain regulations promulgated by the EPA to implement the requirements of RCRA as described above. Characteristics of hazardous waste are described in terms of ignitability, corrosivity, reactivity, and toxicity, and specific types of wastes are listed.

STATE

CALIFORNIA HEALTH AND SAFETY CODE, SECTION 25100 ET SEQ. (HAZARDOUS WASTE CONTROL ACT OF 1972, AS AMENDED).

This act creates the framework under which hazardous wastes must be managed in California. It mandates the State Department of Health Services (now the Department of Toxic Substances Control under the California Environmental Protection Agency, or Cal EPA) 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 creates a manifest system to be used when transporting such wastes.

TITLE 14, CALIFORNIA CODE OF REGULATIONS, SECTION 17200 ET SEQ. (MINIMUM STANDARDS FOR SOLID WASTE HANDLING AND DISPOSAL)

These regulations set forth minimum standards for solid waste handling and disposal, guidelines to ensure conformance of solid waste facilities with county solid waste management plans, as well as enforcement and administration provisions.

TITLE 22, CALIFORNIA CODE OF REGULATIONS, SECTION 66262.10 ET SEQ. (GENERATOR STANDARDS)

These sections establish requirements for generators of hazardous waste. Waste generators must determine if their wastes are hazardous according to specified characteristics or lists of hazardous wastes. As in the federal program, hazardous waste generators must obtain EPA identification numbers, prepare manifests before transporting the waste off site, and use only permitted treatment, storage, and disposal facilities. Additionally, generators must use registered hazardous waste transporters for any off-site shipments. Requirements are also established for record keeping, reporting, packaging, and labeling of hazardous wastes, use of containers and tanks for hazardous waste storage, and limiting the amount of time that hazardous waste can be stored on site.

LOCAL

KERN COUNTY GENERAL PLAN PUBLIC FACILITIES ELEMENT

All generators and processors of hazardous waste are encouraged to develop long-term waste management programs. Large generators of hazardous waste should be encouraged to recycle, treat and detoxify their wastes on site. Many such processes could be implemented in existing industrial map designations, if zoned appropriately (Policy No. 17).

WORKER SAFETY AND FIRE PROTECTION

FEDERAL

- Occupational Safety and Health Act of 1970 (29 United States Code sections 651 et seq.).
- Occupational Safety and Health Administration Safety and Health regulations (29 Code of Federal Regulations//1910.1 - 1910.1500).
- Occupational Safety and Health Act of 1970 (29 United States Code section (USC) (∅) 651 et seq.).
- 29 C.F.R. 1910.120 (HAZWOPER Standard): Defines the regulations for Hazardous Waste Operations and Emergency Response. This section covers the clean-up operations, hazardous materials removal work, corrective actions, voluntary clean-up operations, monitoring, and emergency response required by federal, state, and local agencies of hazardous substances that are present at controlled and uncontrolled hazardous waste sites.
- 29 C.F.R.//1910.1 - 1910.1500 (Occupational Safety and Health Administration Safety and Health regulations).
- 29 C.F.R.//1952.170 - 1952.175 (Approval of California s plan for enforcement of its own Safety and Health requirements, in lieu of most of the federal requirements found in//1910.1 - 1910.1500).

STATE

California s plan for enforcement of its own Safety and Health requirements is in lieu of most of the federal requirements found in 29 CFR//1952.170 - 1952.175.

- Title 8, California Code of Regulations (CCR), section 450 et seq. (Applicable requirements of the Division of Industrial Safety, including Unfired Pressure Vessel Safety Orders, Construction Safety Orders, Electrical Safety Orders, and General Industry Safety Orders).
- California Building Code, Title 24, CCR,/501 et seq. The California Building Code is designed to provide minimum standards to safeguard human life, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, etc. of buildings and structures.
- Title 8, CCR,/ 5192 (HAZWOPER Standard). Defines the regulations for Hazardous Waste Operations and Emergency Response. This section covers the clean-up operations, hazardous removal work, corrective actions, voluntary clean-up operations, monitoring, and emergency response required by federal, state, local agencies of hazardous substances that are present at controlled and uncontrolled hazardous waste sites.

LOCAL

- 1998 Edition of California Fire Code (CFC) and all applicable National Fire Protection Association (NFPA) standards. The fire code contains provisions necessary for fire prevention and information about fire safety, special occupancy uses, special processes, and explosive, flammable, combustible and hazardous materials.
- Uniform Fire Code Standards. This is a companion publication to the CFC and contains standards of the American Society for Testing and Materials and of the National Fire Protection Association.
- California Building Code. (Cal. Code Regs., Tit. 24, / 501 et seq.) The California Building Code is designed to provide minimum standards to safeguard human life, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, etc. of buildings and structures.



ELK HILLS
POWER PROJECT

Appendix B



Proof of Service List



STATE OF CALIFORNIA

Energy Resources Conservation
and Development Commission

In the Matter of:) Docket No. 99-AFC-1
)
Application for Certification for the) PROOF OF SERVICE
Elk Hills Power Project (EHPP))

I, _____, declare that on _____
I deposited copies of the _____ in the United States mail at
Sacramento, CA with first class postage thereon fully prepaid and addressed to the following:

DOCKET UNIT

*Send the original signed document plus the
required 12 copies to the address below:*

**CALIFORNIA ENERGY COMMISSION
DOCKET UNIT, MS-4
Attn: Docket No. 99-AFC-1
1516 Ninth Street
Sacramento, CA 95814-5512**

* * * *

*In addition to the documents sent to the
Commission Docket Unit, also send
individual copies of any documents to:*

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I declare under penalty of perjury that the foregoing is true and correct.

[signature]

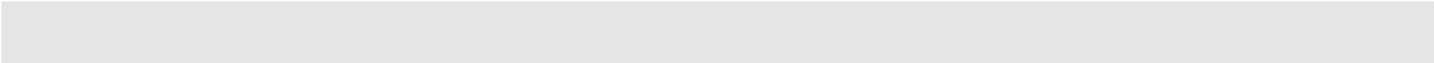


ELK HILLS
POWER PROJECT

Appendix C



Exhibit List



STATE OF CALIFORNIA

Energy Resources Conservation
and Development Commission

In the Matter of:)
)
Application for Certification for the) Docket No. 99-AFC-1
Elk Hills Power Project (EHPP))
_____)

Exhibit List

- Exhibit 1: Application for Certification document, Volumes I- (Text) and Volume II- (Appendices-A-P), filed February 24, 1999; as supplemented by Elk Hills Response to CEC Staff list of data inadequacies filed May 14, 1999. Sponsored by Applicant; received into evidence on January 20, 2000.
- Exhibit 2A: Elk Hills Responses to CEC Staff Data Request #1-44, filed August 6, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 2B: Elk Hills Responses to CEC Staff Data Requests #9, 11, 12, 28c, 31, 34 and 35 filed August 11, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 2C: Elk Hills Addenda Response to CEC Staff Data Requests #2, 41 and 42, filed August 23, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 2D: Elk Hills Response to CEC Staff Data Requests #42, filed October 25, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 2E: Elk Hills Addendum Responses to CEC Staff Data Request #42 filed October 4, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 2F: Elk Hills Responses to CEC Staff Data Request #45 through 79, filed September 24, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 2G: Elk Hills Responses to CEC Staff Data Request #80-90, filed October 4, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.

- Exhibit 3: Selected Elk Hills responses to CURE Data Requests #2-146, filed September 8, 1999. Sponsored by Applicant; received into evidence on January 27, 2000.
- Exhibit 3A: Elk Hills addendum to responses to CURE Data Request #34, 39,103 and 113, filed September 20, 1999. Sponsored by Applicant; received into evidence on January 20, 2000.
- Exhibit 3B: Elk Hills supplemental responses to CURE Data Request #113, filed September 27, 1999. Sponsored by Applicant; received into evidence on January 27, 2000.
- Exhibit 4: Letter from E. Knight to Mark Pryor, concerning traffic and transportation, filed November 1, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 5: Letter from Glenn Barnhill, Kern County Planning Department, to Amanda Stennick, CEC, dated September 2, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 6: Letter from Dennis Champion, Elks Hills Power, to Dave Kessler, Federal Aviation Administration (FAA), dated October 7, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 7: FAA Determination of No Hazard to Air Navigation issued December 2, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 8: Letter from Dennis Champion, Elk Hills Power, to Jake Sweeney, Kern County Planning Department, dated August 27, 1999 and docketed on November 9, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 9: Letter from Jake Sweeney, Kern County Planning Department, to Dennis Champion, Elk Hills Power, dated September 15, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 10: Letters to the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD), filed October 22, 1999, and dated respectively. Sponsored by Applicant; received into evidence on January 20, 2000.
- Exhibit 10A: Letter to SJVUAPCD dated October 8, 1999. Sponsored by Applicant; received into evidence on January 20, 2000.
- Exhibit 10B: Letter to SJVUAPCD dated October 16, 1999. Sponsored by Applicant; received into evidence on January 20, 2000.

- Exhibit 10C: Letter to SJVUAPCD dated October 20, 1999. Sponsored by Applicant; received into evidence on January 20, 2000.
- Exhibit 11: Letter from Dennis Champion, Elk Hills Power, to Barry Hayslett, Kern County Roads Department, dated November 2, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 12: Letter from Barry Hayslett, Kern County Roads Department, to Marc Pryor, CEC, dated November 9, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 13: Letter from Dennis Champion, Elk Hills Power, to Marc Pryor, CEC, dated November 18, 1999. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 14: Historical Resources Evaluation and Assessment Report of Western Naval Petroleum Reserve #1. Sponsored by Applicant; received into evidence on January 20, 2000. (Filed confidentially on December 29, 1999.)
- Exhibit 15: Letter from Dan Abeyra Acting State Historic Preservation Officer to James C. Killen, Naval Petroleum Reserve, dated September 28, 1999. Sponsored by Applicant; received into evidence on January 20, 2000.
- Exhibit 16: Letter from Cheryl Widell, State Historic Preservation Officer, to Anthony J. Como, U.S. Department of Energy, dated December 11, 1997. Sponsored by Applicant; received into evidence on January 20, 2000.
- Exhibit 17: System Impact Study, Elk Hills Power Project, Pacific Gas & Electric Company (December 15, 1999). Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 18: West Kern Ground Water Management Plan, dated February 1997. Sponsored by Applicant; received into evidence on March 9, 2000.
- Exhibit 19: January 5, 2000 Final Staff Assessment (FSA) on Phase I issues (Part 1 of 3). Sponsored by Staff and received into evidence on January 25 and 27, and on February 1, 2000.
- Exhibit 19A: February 18, 2000 FSA on Phase II issues of Biological and Soil and Water Resources (Part 2 Of 3). Sponsored by Staff; received into evidence on March 9, and May 2, 2000.
- Exhibit 19B: March 2, 2000 Supplemental Testimony of Joe O'Hagan and Robert Anderson on Soil and Water Resources. Sponsored by Staff; received into evidence on March 9, 2000 .

- Exhibit 19C: April 4, 2000 (Attachment A to Staff's Opening Brief on Phase II Issues dated April 4, 2000) Supplemental Testimony of Joe O Hagan and Robert Anderson on Soil and Water Resources. Sponsored by Staff; received into evidence on March 9, 2000 and May 2, 2000.
- Exhibit 19D: April 28, 2000 FSA on Phase III issues of Air Quality and Alternatives (Part 3 Of 3), and revised Air Quality Condition AQ-C2. Sponsored by Staff; received into evidence on May 16.
- Exhibit 19E: October 20, 2000, Attachment A, Water Resources Supplemental Testimony of Joe O Hagan. Sponsored by Staff; received into evidence on October 26, 2000.
- Exhibit 20: Applicant's testimony on various sections from topic areas in testimony admitted. Sponsored by Applicant; received into evidence on 1/20/2000, 1/25/2000, 1/27/2000, 2/12/2000, 3/9/2000.
- Exhibit 21: Errata to Socioeconomics Testimony submitted by Dr. Joseph Diamond. Sponsored by Staff; received into evidence on January 20, 2000.
- Exhibit 21A: Errata to Geology Testimony, 1 page. Sponsored by Staff; received into evidence on January 20, 2000.
- Exhibit 21B: Errata to Cultural Resources Testimony submitted by Roberta S. Greenwood and Dorothy Torres. Sponsored by Staff; received into evidence on January 20, 2000.
- Exhibit 21C: Errata to Transmission System Engineering Testimony submitted by Mark Hestes. Sponsored by Staff; received into evidence on January 25, 2000.
- Exhibit 21D: Errata to Public Health Testimony submitted by Steven Radis. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 21E: Errata to Hazmat Testimony submitted by Gary Cronk. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 21F: Errata to Hazmat Testimony submitted by Joseph Loyer. Sponsored by Staff; received into evidence on January 25, 2000.
- Exhibit 21G: Errata to Traffic and Transportation Testimony of Rick Tyler. Sponsored by Staff; received into evidence on January 27, 2000.
- Exhibit 21H: Supplemental Testimony of Rick Tyler on Traffic and Transportation. Sponsored by Staff; received into evidence on January 27, 2000.

- Exhibit 21I: Errata to Testimony of J. Phyllis Fox, Ph.D on behalf of the California Unions For Reliable Energy on Waste Management and Worker Safety Impacts of the Elk Hills Power Project, dated February 1, 2000. Sponsored by Intervenor CURE; received into evidence on February 1, 2000.
- Exhibit 21J: Declaration and Resume of Linda K. Spiegel, Staff Biologist. Sponsored by Staff and received into evidence on March 9, 2000.
- Exhibit 21K: Declaration of Joseph O Hagan, Staff Planner II, Office of Environmental Protection. Sponsored by Staff; received into evidence on March 9, 2000.
- Exhibit 21L: Errata to Biological Resources Mitigation Implementation and Monitoring Plan. Sponsored by Applicant; received into evidence on March 9, 2000.
- Exhibit 21M: Errata to Soil and Water Resources Final Staff Analysis. Sponsored by Staff; received into evidence on March 9, 2000.
- Exhibit 22: Reports of Conversation, dated January 18, 2000, with Eugene Albitre (p. 1) and Pilulaw Khaz Zarate (p. 2). Sponsored by Intervenor CURE; received into evidence on January 20, 2000.
- Exhibit 23: Testimony of Delia Dominguez with Exhibits A and C. Exhibit B filed under Confidential cover. Sponsored by Intervenor CURE; received into evidence on January 20, 2000.
- Exhibit 24: Cal-ISO Testimony of Ron S. Daschmans dated January 4, 2000, on Transmission Systems Engineering. Sponsored by Applicant; received into evidence on January 25, 2000.
- Exhibit 25: Public Health Testimony of Dr. Phyllis Fox. Sponsored by Intervenor CURE; received into evidence on January 25, 2000.
- Exhibit 26: Rijnmond Report, App. 8/13; with Dr. Fox markings (3.72 x 10-5). Sponsored by Intervenor CURE; received into evidence on January 27, 2000.
- Exhibit 26A: Rijnmond Report, App. 8/13; with Dr. Fox markings (2.43 x 10-3/yr5). Sponsored by Intervenor CURE; received into evidence on January 27, 2000.
- Exhibit 27: Figure 3.2-2, with Dr. Fox s markings (650). Sponsored by Intervenor CURE; received into evidence on January 27, 2000.
- Exhibit 27A: Figure 3.2-2, with Dr. Fox s markings (Controlled Alternate). Sponsored by Intervenor CURE; received into evidence on January 27, 2000.

- Exhibit 27B: Figure 3.2.-2, with Dr. Fox s markings (uncontrolled most likely). Sponsored by Intervenor CURE; received into evidence on January 27, 2000.
- Exhibit 27C: Figure 3.2.-2, with Dr. Fox s markings (controlled alternate). Sponsored by Intervenor CURE; received into evidence on January 27, 2000.
- Exhibit 27D: Figure 3.2.-2, with Dr. Fox s markings. Sponsored by Intervenor CURE; received into evidence on January 27, 2000.
- Exhibit 28: Figure 1 labeled Worst-Case Scenario (App. I to Testimony of Dr. Fox). Sponsored by Intervenor CURE; received into evidence on January 27, 2000.
- Exhibit 29: Summary of Off-site Consequences Analysis Modeling Results (App. I to Testimony of Dr. Fox). Sponsored by Intervenor CURE; received into evidence on January 27, 2000.
- Exhibit 30: Hazmat and Traffic and Transportation Testimony of Dr. Phyllis Fox. Sponsored by Intervenor CURE; received into evidence on January 27, 2000.
- Exhibit 31: Rijnmond Report Table A.8.2. Sponsored by Staff; received into evidence on January 27, 2000.
- Exhibit 32: Chevron Gaviota Facility Study prepared for the County of Santa Barbara System Safety and Reliability Committee, dated May 23, 1991. Sponsored by CURE; received into evidence on January 27, 2000.
- Exhibit 33: Letter from Wade Cornwell of the DOTSC to Marc Pryor, dated April 8, 1999. Sponsored by Staff; received into evidence on February 1, 2000.
- Exhibit 34: Dr. Fox s testimony on Waste Management and Worker Safety. Sponsored by Intervenor CURE; submitted into evidence on February 1, 2000.
- Exhibit 35: Biological Resources Mitigation Implementation and Monitoring Plan. Sponsored by Applicant; received into evidence on March 9, 2000.
- Exhibit 36: Comparative Evaluation Chart of Water Source Alternatives. Sponsored by Applicant; received into evidence on March 9, 2000.
- Exhibit 37: Information Needs for Class V Injection Wells, Elk Hills Power Plant, dated September 21, 1999. Sponsored by ?; and received into evidence on ?.

- Exhibit 38: Elk Hill s objection to specific California Unions for Reliable Energy (CURE) Data Requests, dated August 6, 1999 and received August 9, 1999 , dated August 24, 1999. Sponsored by Applicant; received into evidence on March 9, 2000.
- Exhibit 39: Supplemental testimony of J. Phyllis Fox, Ph.D., on behalf of the California Unions for Reliable Energy on Water Impacts of the Elk Hills Power Project. Sponsored by Intervenor CURE; submitted into evidence on March 9, 2000.
- Exhibit 40: Appendix A (to Applicant s Opening brief on Phase II issues dated April 11, 2000). Sponsored by Applicant and submitted into evidence on May 2, 2000.
- Exhibit 41: Section 2D and Table 1 and Appendices to CURE s Opening Brief on Phase II issues dated April 4, 2000. Submitted by CURE and received into evidence on May 2, 2000.
- Exhibit 42: **(For identification only; not admitted into evidence.)** CURE s reply brief on Phase II issues.
- Exhibit 43: Final Determination of Compliance (w/attachments) from the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). Sponsored by the SJVUAPCD and received into evidence on 5/16/00.
- Exhibit 44: Dr. Fox testimony on Air Quality (w/attachments). Sponsored by CURE and received into evidence on 5/16/00.
- Exhibit 45: Testimony of Mr. David Marcus on behalf of CURE on Air Quality impacts of the Elk Hills Power Project. Sponsored by CURE and received into evidence on 5/16/00.
- Exhibit 46: Testimony of Joseph H. Rowley regarding use of recycled water with attachments A & B. Sponsored by Applicant; received into evidence on October 26, 2000.
- Exhibit 47: Testimony of Peter M. MacLaggan concerning applicability and requirements of Water Code, sections 13550, 13551, 13552.6 and 13552.8. Sponsored by Applicant; received into evidence on October 26, 2000.
- Exhibit 48: Vita of Peter M. MacLaggan. Sponsored by Applicant; received into evidence on October 26, 2000.

JOINT EXHIBITS

- Exhibit 1: Joint Statement of Applicant and Intervenor CURE regarding agreement on environmental issues. Sponsored by Applicant and Intervenor CURE; received into evidence on October 26, 2000.
- Exhibit 2: Additional Modifications to Conditions of Certification in the following topic areas: Hazardous Materials Management, Soil and Water Resources and Traffic and Transportation.



ELK HILLS
POWER PROJECT

Appendix D



Glossary of Terms and Acronyms



GLOSSARY OF TERMS AND ACRONYMS

	A		BARCT	Best Available Retrofit Control Technology
A	Ampere		bbl	barrel
AAL	all aluminum (electricity conductor)		BCDC	Bay Conservation and Development Commission
AAQS	Ambient Air Quality Standards		BCF	billion cubic feet
ABAG	Association of Bay Area Governments		Bcfd	billion cubic feet per day
AC	alternating current		b/d	barrels per day
ACE	Argus Cogeneration Expansion Project Army Corps of Engineers		BLM	Bureau of Land Management
ACSR	aluminum covered steel reinforced (electricity conductor)		BPA	U.S. Bonneville Power Administration
AFC	Application for Certification		BR	Biennial Report
AFY	acre-feet per year		Btu	British thermal unit
AHM	Acutely Hazardous Materials		C	
ANSI	American National Standards Institute		CAA	U.S. Clean Air Act
APCD	Air Pollution Control District		CAAQS	California Ambient Air Quality Standards
APCO	Air Pollution Control Officer		CALEPA	California Environmental Protection Agency
AQMD	Air Quality Management District		CALTRANS	California Department of Transportation
AQMP	Air Quality Management Plan		CAPCOA	California Air Pollution Control Officers Association
ARB	Air Resources Board		CBC	California Building Code
ARCO	Atlantic Richfield Company		CCAA	California Clean Air Act
ASAE	American Society of Architectural Engineers		CDF	California Department of Forestry
ASHRAE	American Society of Heating Refrigeration & Air Conditioning Engineers		CDFG	California Department of Fish and Game
ASME	American Society of Mechanical Engineers		CEERT	Coalition for Energy Efficiency and Renewable Technologies
ATC	Authority to Construct		CEM	continuous emissions monitoring
	B		CEQA	California Environmental Quality Act
BAAQMD	Bay Area Air Quality Management District		CESA	California Endangered Species Act
BACT	Best Available Control Technology		CFB	circulating fluidized bed
BAF	Basic American Foods		CFCs	chloro-fluorocarbons
			cfm	cubic feet per minute

CFR Code of Federal Regulations

cfs cubic feet per second

CLUP Comprehensive Land Use Plan

CNEL Community Noise Equivalent Level

CO carbon monoxide

CO₂ carbon dioxide

COI California Oregon Intertie

CPCN Certificate of Public Convenience & Necessity

CPM Compliance Project Manager

CPUC California Public Utilities Commission

CT combustion turbine
current transformer

CTG combustion turbine generator

CURE California Unions for Reliable Energy

D

dB decibel

dB(A) decibel on the A scale

DC direct current

DCTL Double Circuit Transmission Line

DEIR Draft Environmental Impact Report

DEIS Draft Environmental Impact Statement

DFG California Department of Fish and Game

DHS California Department of Health Services

DISCO Distribution Company

DOC Determination of Compliance

DOE U.S. Department of Energy

DSM demand side management

DTC Desert Tortoise Council

DWR California Department of Water Resources

E

EDF Environmental Defense Fund

Edison Southern California Edison Company

EDR Energy Development Report

EFS&EPD Energy Facilities Siting and Environmental Protection Division

EIA U.S. Energy Information Agency

EIR Environmental Impact Report

EIS Environmental Impact Statement

ELFIN Electric Utility Financial and Production Simulation Model

EMF electric and magnetic fields

EOR East of River (Colorado River)

EPA U.S. Environmental Protection Agency

EPRI Electric Power Research Institute

ER Electricity Report

ERC emission reduction credit {offset}

ESA Endangered Species Act (Federal)
Environmental Site Assessment

ETSR Energy Technologies Status Report

F

FAA Federal Aviation Administration

FBE Functional Basis Earthquake

FCAA Federal Clean Air Act

FCC Federal Communications Commission

FEIR Final Environmental Impact Report

FIP Federal Implementation Plan

FONSI Finding of No-Significant Impact

FERC Federal Energy Regulatory Commission

FSA Final Staff Assessment

G

GEP	good engineering practice	KGRA	known geothermal resource area
GIS	gas insulated switchgear geographic information system	km	kilometer
gpd	gallons per day	KOP	key observation point
gpm	gallons per minute	KRCC	Kern River Cogeneration Company
GW	gigawatt	kV	kilovolt
GWh	gigawatt hour	KVAR	kilovolt-ampere reactive
	H	kW	kilowatt
H ₂ S	hydrogen sulfide	kWe	kilowatt, electric
HCP	habitat conservation plan	kWh	kilowatt hour
HHV	higher heating value	kWp	peak kilowatt
HRA	Health Risk Assessment		L
HRSR	heat recovery steam generator	LADWP	Los Angeles Department of Water and Power
HV	high voltage	LAER	Lowest Achievable Emission Rate
HVAC	heating, ventilating and air conditioning	lbs	pounds
	I	lbs/hr	pounds per hour
IAR	Issues and Alternatives Report	lbs/MMBtu	pounds per million British thermal units
IEA	International Energy Agency	LCAQMD	Lake County Air Quality Management District
IEEE	Institute of Electrical & Electronics Engineers	LMUD	Lassen Municipal Utility District
IID	Imperial Irrigation District	LORS	laws, ordinances, regulations and standards
IIR	Issues Identification Report		M
IOU	Investor-Owned Utility	m (M)	meter, million, mega, milli or thousand
IS	Initial Study	MBUAPCD	Monterey Bay Unified Air Pollution Control District
ISO	Independent System Operator	MCE	maximum credible earthquake
	J	MCF	thousand cubic feet
JES	Joint Environmental Statement	MCL	Maximum Containment Level
	K	MCM	thousand circular mil (electricity conductor)
KCAPCD	Kern County Air Pollution Control District	µg/m ³	micro grams (10 ⁻⁶ grams) per cubic meter
KCM	thousand circular mils (also KCmil) (electricity conductor)		

MEID	Merced Irrigation District	NOP	Notice of Preparation (of EIR)
MG	milli gauss	NOV	Notice of Violation
mgd	million gallons per day	NRDC	Natural Resources Defense Council
MID	Modesto Irrigation District	NSCAPCD	Northern Sonoma County Air Pollution Control District
MOU	Memorandum of Understanding	NSPS	New Source Performance Standards
MPE	maximum probable earthquake	NSR	New Source Review
m/s	meters per second		O
MS	Mail Station		O ₃
MVAR	megavolt-ampere reactive	OASIS	Open Access Same-Time Information System
MW	megawatt (million watts)	OCB	oil circuit breaker
MWA	Mojave Water Agency	OCSG	Operating Capability Study Group
MWD	Metropolitan Water District	O&M	operation and maintenance
MWh	megawatt hour	OSHA	Occupational Safety and Health Administration (or Act)
MWp	peak megawatt		P
	N		
N-1	one transmission circuit out	PG&E	Pacific Gas & Electric Company
N-2	two transmission circuits out	PDCI	Pacific DC Intertie
NAAQS	National Ambient Air Quality Standards	PHC(S)	Prehearing Conference (Statement)
NCPA	Northern California Power Agency	PIFUA	Federal Powerplant & Industrial Fuel Use Act of 1978
NEPA	National Energy Policy Act National Environmental Policy Act	PM	Project Manager particulate matter
NERC	National Electric Reliability Council	PM ₁₀	particulate matter 10 microns and smaller in diameter
NESHAPS	National Emission Standards for Hazardous Air Pollutants	PM _{2.5}	particulate matter 2.5 microns and smaller in diameter
NMHC	nonmethane hydrocarbons	ppb	parts per billion
NO	nitrogen oxide	ppm	parts per million
NOI	Notice of Intention	ppmvd	parts per million by volume, dry
NOL	North of Lugo	ppt	parts per thousand
NO _x	nitrogen oxides	PRC	California Public Resources Code
NO ₂	nitrogen dioxide		

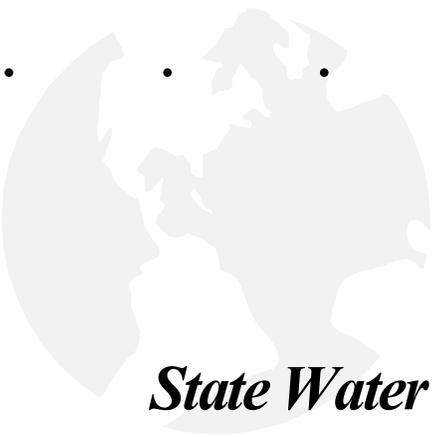
PSD	Prevention of Significant Deterioration	SCAQMD	South Coast Air Quality Management District
PSRC	Plumas Sierra Rural Electric Cooperative	SCE	Southern California Edison Company
PT	potential transformer	SCFM	standard cubic feet per minute
PTO	Permit to Operate	SCH	State Clearing House
PU	per unit	SCIT	Southern California Import Transmission
PURPA	Federal Public Utilities Regulatory Policy Act of 1978	SCR	Selective Catalytic Reduction
PV	Palo Verde photovoltaic	SCTL	single circuit transmission line
PX	Power Exchange	SDCAPCD	San Diego County Air Pollution Control District
	Q	SDG&E	San Diego Gas & Electric Company
QA/QC	Quality Assurance/Quality Control	SEPCO	Sacramento Ethanol and Power Cogeneration Project
QF	Qualifying Facility	SIC	Standard industrial classification
	R	SIP	State Implementation Plan
RACT	Reasonably Available Control Technology	SJVAB	San Joaquin Valley Air Basin
RDF	refuse derived fuel	SJVAQMD	San Joaquin Valley Air Quality Management District
ROC	Report of Conversation reactive organic compounds	SMAQMD	Sacramento Metropolitan Air Quality Management District
ROG	reactive organic gas	SMUD	Sacramento Municipal Utility District
ROW	right of way	SMUDGE	SMUD Geothermal
RWQCB	Regional Water Quality Control Board	SNCR	Selective Noncatalytic Reduction
	S	SNG	Synthetic Natural Gas
SACOG	Sacramento Area Council of Governments	SO ₂	sulfur dioxide
SANBAG	San Bernardino Association of Governments	SO _x	sulfur oxides
SANDAG	San Diego Association of Governments	SO ₄	sulfates
SANDER	San Diego Energy Recovery Project	SoCAL	Southern California Gas Company
SB	Senate Bill	SONGS	San Onofre Nuclear Generating Station
SCAB	South Coast Air Basin	SPP	Sierra Pacific Power
SEGS	Solar Electric Generating Station	STIG	steam injected gas turbine
SCAG	Southern California Association of Governments		

SWP	State Water Project	UDC	Utility Displacement Credits
SWRCB	State Water Resources Control Board	UDF	Utility Displacement Factor
	T	UEG	Utility Electric Generator
TAC	Toxic Air Contaminant	USC(A)	United States Code (Annotated)
TBtu	trillion Btu	USCOE	U.S. Corps of Engineers
TCF	trillion cubic feet	USEPA	U.S. Environmental Protection Agency
TCM	transportation control measure	USFS	U.S. Forest Service
TDS	total dissolved solids	USFWS	U.S. Fish and Wildlife Service
TE	transmission engineering	USGS	U.S. Geological Survey
TEOR	Thermally Enhanced Oil Recovery		V
TID	Turlock Irrigation District	VCAPCD	Ventura County Air Pollution Control District
TL	transmission line or lines	VOC	volatile organic compounds
T-Line	transmission line		W
TOG	total organic gases	W	Watt
TPD	tons per day	WAA	Warren-Alquist Act
TPY	tons per year	WEPEX	Western Energy Power Exchange
TS&N	Transmission Safety and Nuisance	WICF	Western Interconnection Forum
TSE	Transmission System Engineering	WIEB	Western Interstate Energy Board
TSIN	Transmission Services Information Network	WOR	West of River (Colorado River)
TSP	total suspended particulate matter	WRTA	Western Region Transmission Association
	U	WSCC	Western System Coordination Council
UBC	Uniform Building Code	WSPP	Western System Power Pool

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ELK HILLS
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Appendix E



*State Water Resources Control Board-
Water Quality Control Policy*

(SWRCB 75-58)

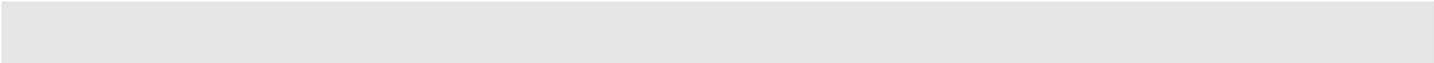


ELK HILLS POWER PROJECT

Appendix F



Water Code (1 - 4)



Article 7. Waste water reuse

§ 13550. Legislative findings

(a) The Legislature hereby finds and declares that the use of potable domestic water for nonpotable uses, including, but not limited to, cemeteries, golf courses, parks, highway landscaped areas, and industrial and irrigation uses, is a waste or an unreasonable use of the water within the meaning of Section 2 of Article X of the California Constitution if recycled water is available which meets all of the following conditions, as determined by the state board, after notice to any person or entity who may be ordered to use recycled water or to cease using potable water and a hearing held pursuant to Article 2 (commencing with Section 648) of Chapter 1.5 of Division 3 of Title 23 of the California Code of Regulations:

(1) The source of recycled water is of adequate quality for these uses and is available for these uses. In determining adequate quality, the state board shall consider all relevant factors, including, but not limited to, food and employee safety, and level and types of specific constituents in the recycled water affecting these uses, on a user-by-user basis. In addition, the state board shall consider the effect of the use of recycled water in lieu of potable water on the generation of hazardous waste and on the quality of wastewater discharges subject to regional, state, or federal permits.

(2) The recycled water may be furnished for these uses at a reasonable cost to the user. In determining reasonable cost, the state board shall consider all relevant factors, including, but not limited to, the present and projected costs of supplying, delivering, and treating potable domestic water for these uses and the present and projected costs of supplying and delivering recycled water for these uses, and shall find that the cost of supplying the treated recycled water is comparable to, or less than, the cost of supplying potable domestic water.

(3) After concurrence with the State Department of Health Services, the use of

recycled water from the proposed source will not be detrimental to public health.

(4) The use of recycled water for these uses will not adversely affect downstream water rights, will not degrade water quality, and is determined not to be injurious to plantlife, fish, and wildlife.

(b) In making the determination pursuant to subdivision (a), the state board shall consider the impact of the cost and quality of the nonpotable water on each individual user.

(c) The state board may require a public agency or person subject to this article to furnish information which the state board determines to be relevant to making the determination required in subdivision (a).

§ 13551. Availability of recycled water

A person or public agency, including a state agency, city, county, city and county, district, or any other political subdivision of the state, shall not use water from any source of quality suitable for potable domestic use for nonpotable uses, including cemeteries, golf courses, parks, highway landscaped areas, and industrial and irrigation uses if suitable recycled water is available as provided in Section 13550; however, any use of recycled water in lieu of water suitable for potable domestic use shall, to the extent of the recycled water so used, be deemed to constitute a reasonable beneficial use of that water and the use of recycled water shall not cause any loss or diminution of any existing water right.

§ 13552. Legislative intent

The amendments to Sections 13550 and 13551 of the Water Code made during the first year of the 1991-92 Regular Session are not intended to alter any rights, remedies, or obligations which may exist prior to January 1, 1992, pursuant to, but not limited to, those sections or Chapter 8.5 (commencing with Section 1501) of Part 1 of Division 1 of the Public Utilities Code.

§ 13552.2. Legislative findings

(a) The Legislature hereby finds and declares that the use of potable domestic water for the irrigation of residential landscaping is a waste or an unreasonable use of water within the meaning of Section 2 of Article X of the California Constitution if recycled water, for this use, is available to the residents and meets the requirements set forth in Section 13550, as determined by the state board after notice and a hearing.

(b) The state board may require a public agency or person subject to this section to submit information that the state board determines may be relevant in making the determination required in subdivision (a).

§ 13552.4. Required use for landscaping

(a) Any public agency, including a state agency, city, county, city and county, district, or any other political subdivision of the state, may require the use of recycled water for irrigation of residential landscaping, if all of the following requirements are met:

(1) Recycled water, for this use, is available to the user and meets the requirements set forth in Section 13550, as determined by the state board after notice and a hearing.

(2) The use of recycled water does not cause any loss or diminution of any existing water right.

(3) The irrigation systems are constructed in accordance with Chapter 3 (commencing with Section 60301) of Division 4 of Title 22 of the California Code Regulations.

(b) This section applies to both of the following:

(1) New subdivisions for which the building permit is issued on or after March 15, 1994, or, if a building permit is not required, new structures for which construction begins on or after March 15, 1994, for which the State Department of Health Services has approved the use of recycled water.

(2) Any residence that is retrofitted to permit the use of recycled water for landscape irrigation and for which the State

Department of Health Services has approved the use of recycled water.

(c) (1) Division 13 (commencing with Section 21000) of the Public Resources Code does not apply to any project which only involves the repiping, redesign, or use of recycled water for irrigation of residential landscaping necessary to comply with a requirement prescribed by a public agency under subdivision (a).

(2) The exemption in paragraph (1) does not apply to any project to develop recycled water, to construct conveyance facilities for recycled water, or any other project not specified in this subdivision.

§ 13552.6. Regarding cooling

(a) The Legislature hereby finds and declares that the use of potable domestic water for floor trap priming, cooling towers, and air-conditioning devices is a waste or an unreasonable use of water within the meaning of Section 2 of Article X of the California Constitution if recycled water, for these uses, is available to the user, and the water meets the requirements set forth in Section 13550, as determined by the state board after notice and a hearing.

(b) The state board may require a public agency or person subject to this section to submit information that the state board determines may be relevant in making the determination required in subdivision (a).

§ 13552.8. Required use for cooling

(a) Any public agency, including a state agency, city, county, city and county, district, or any other political subdivision of the state, may require the use of recycled water in floor trap priming, cooling towers, and air-conditioning devices, if all of the following requirements are met:

(1) Recycled water, for these uses, is available to the user and meets the requirements set forth in Section 13550, as determined by the state board after notice and a hearing.

(2) The use of recycled water does not cause any loss or diminution of any existing water right.

(3) If public exposure to aerosols, mist, or spray may occur, appropriate mist mitigation or mist control is provided, such as the use of mist arrestors or the addition of biocides to the water in accordance with criteria established pursuant to Section 13521.

(4) The person intending to use recycled water has prepared an engineering report pursuant to Section 60323 of Title 22 of the California Code of Regulations that includes plumbing design, cross-connection control, and monitoring requirements for the public agency, which are in compliance with criteria established pursuant to Section 13521.

(b) This section applies to both of the following:

(1) New industrial facilities and subdivisions for which the building permit is issued on or after March 15, 1994, or, if a building permit is not required, new structures for which construction begins on or after March 15, 1994, for which the State Department of Health Services has approved the use of recycled water.

(2) Any structure that is retrofitted to permit the use of recycled water for floor traps, cooling towers, or air-conditioning devices, for which the State Department of Health Services has approved the use of recycled water.

(c) (1) Division 13 (commencing with Section 21000) of the Public Resources Code does not apply to any project which only involves the repiping, redesign, or use of recycled water for floor trap priming, cooling towers, or air-conditioning devices necessary to comply with a requirement prescribed by a public agency under subdivision (a).

(2) The exemption in paragraph (1) does not apply to any project to develop recycled water, to construct conveyance facilities for recycled water, or any other project not specified in this subdivision.

§ 13553. Regarding toilet flushing

(a) The Legislature hereby finds and declares that the use of potable domestic water for toilet and urinal flushing in structures is a waste or an unreasonable use

of water within the meaning of Section 2 of Article X of the California Constitution if recycled water, for these uses, is available to the user and meets the requirements set forth in Section 13550, as determined by the state board after notice and a hearing.

(b) The state board may require a public agency or person subject to this section to furnish whatever information may be relevant to making the determination required in subdivision (a).

(c) For the purposes of this section and Section 13554, "structure" or "structures" means commercial, retail, and office buildings, theaters, auditoriums, schools, hotels, apartments, barracks, dormitories, jails, prisons, and reformatories, and other structures as determined by the State Department of Health Services.

(d) Nothing in this section or Section 13554 applies to a pilot program adopted pursuant to Section 13553.1.

§ 13553.1. Legislative findings

(a) The Legislature hereby finds and declares that certain coastal areas of the state have been using sea water to flush toilets and urinals as a means of conserving potable water; that this practice precludes the beneficial reuse of treated wastewater and has had a deleterious effect on the proper wastewater treatment process, and has led to corrosion of the sea water distribution pipelines and wastewater collection systems; and that this situation must be changed.

(b) There is a need for a pilot program to demonstrate that conversion to the use of recycled water in residential buildings for toilet and urinal flushing does not pose a threat to public health and safety.

(c) A city that is providing a separate distribution system for sea water for use in flushing toilets and urinals in residential structures may, by ordinance, authorize the use of recycled water for the flushing of toilets and urinals in residential structures if the level of treatment and the use of the recycled water meets the criteria set by the State Department of Health Services.

§ 13554. Required use for toilet flushing

(a) Any public agency, including a state agency, city, county, city and county, district, or any other political subdivision of the state, may require the use of recycled water for toilet and urinal flushing in structures, except a mental hospital or other facility operated by a public agency for the treatment of persons with mental disorders, if all of the following requirements are met:

(1) Recycled water, for these uses, is available to the user and meets the requirements set forth in Section 13550, as determined by the state board after notice and a hearing.

(2) The use of recycled water does not cause any loss or diminution of any existing water right.

(3) The public agency has prepared an engineering report pursuant to Section 60323 of Title 22 of the California Code of Regulations that includes plumbing design, cross-connection control, and monitoring requirements for the use site, which are in compliance with criteria established pursuant to Section 13521.

(b) This section applies only to either of the following:

(1) New structures for which the building permit is issued on or after March 15, 1992, or, if a building permit is not required, new structures for which construction begins on or after March 15, 1992.

(2) Any construction pursuant to subdivision (a) for which the State Department of Health Services has, prior to January 1, 1992, approved the use of recycled water.

(c) Division 13 (commencing with Section 21000) of the Public Resources Code does not apply to any project which only involves the repiping, redesign, or use of recycled water by a structure necessary to comply with a requirement issued by a public agency under subdivision (a). This exemption does not apply to any project to develop recycled water, to construct conveyance facilities for recycled water, or any other project not specified in this subdivision.