Preliminary Staff Assessment

INLAND EMPIRE ENERGY CENTER

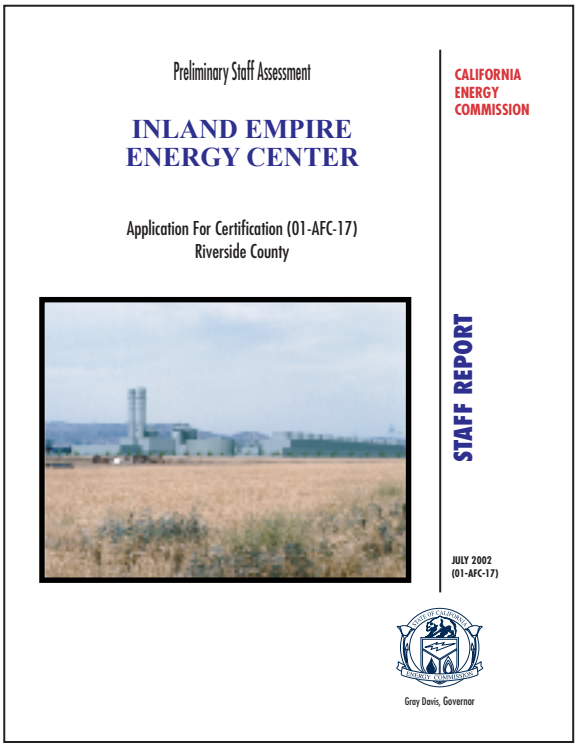
Application For Certification (01-AFC-17)
Riverside County

CALIFORNIA ENERGY COMMISSION

STAFF REPORT

JULY 2002
(01-AFC-17)

Gray Davis, Governor



CALIFORNIA ENERGY COMMISSION

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EXECUTIVE SUMMARY

INTRODUCTION

This Preliminary Staff Assessment (PSA) contains the California Energy Commission (Energy Commission) staff's independent analysis and preliminary recommendation on the Inland Empire Energy Center Project (IEEC). The IEEC and related facilities, such as the electric transmission lines, natural gas line, water supply lines and wastewater lines, are under the Energy Commission's jurisdiction. When issuing a license, the Energy Commission acts as lead state agency under the California Environmental Quality Act, and its process is functionally equivalent to the preparation of an environmental impact report. Sometime after a 30-day public comment period, staff will issue its testimony in the form of the Final Staff Assessment (FSA).

The Energy Commission staff has the responsibility to complete an independent assessment of the project's potential effects on the environment, the public's health and safety, and whether the project conforms with all applicable laws, ordinances, regulations and standards (LORS). The staff also recommends measures to mitigate potential significant adverse environmental effects and conditions for construction, operation and eventual closure of the project, if approved by the Energy Commission.

This PSA is not the decision document for these proceedings nor does it contain findings of the Energy Commission related to environmental impacts or the project's compliance with local/state/federal legal requirements. The FSA will serve as staff's testimony in evidentiary hearings to be held by the Committee of two Commissioners who are hearing this case. The Committee will hold evidentiary hearings and will consider the recommendations presented by staff, the applicant, all parties, government agencies, and the public prior to proposing its decision. The Energy Commission will make the final decision, including findings, after the Committee's publication of its proposed decision.

PROJECT LOCATION AND DESCRIPTION

On August 17, 2001, Inland Empire Energy Center, LLC filed an Application for Certification (AFC) seeking approval from the Energy Commission to construct and operate the Inland Empire Energy Center ("IEEC" or "the project"), a natural-gas-fired, combined-cycle generating facility with a nominal gross generating capacity of 670 megawatts (MW).

The project site is located approximately six miles west of the City of Hemet, four miles east of the City of Perris, and 30-miles southeast of the City of Riverside, near the communities of Romoland and Sun City, in an unincorporated portion of Riverside County (see **PROJECT DESCRIPTION Figure 1**). The 46-acre project site is bordered by Ethanac Road and the Burlington Northern Santa Fe (BNSF) railway to the north, Antelope Road to the west, McLaughlin Road to the south, and San Jacinto Road to the east.

The proposed project consists of two GE PG 7251(FB) combustion turbine-generators (CTGs) with heat recovery steam generators (HRSG), one steam turbine generator (STG), associated pollution-control equipment, a switchyard, and other ancillary facilities. A new 500 kV transmission line would connect the on-site switchyard to the existing Southern California Edison (SCE) Valley substation located approximately one-mile east of the project site. The project would also include construction of a new 18-inch, 4.7-mile pipeline for the disposal of non-reclaimable wastewater. Sanitary wastewater would be discharged to an existing 33-inch sewer line in McLaughlin Road. The project would use up to 5,000 acre feet per year of recycled water as it is available; initially, a limited amount of raw water would supplement the use of recycled water. Natural gas would be delivered to the facility via a new 20-inch pipeline and compressor station that would connect to the existing Sempra Energy gas line located along Menifee Road; the compressor station and associated facilities would occupy 2.6 acres of a 6.7-acre parcel located approximately one-mile southeast of the project site.

To control emissions of air pollutants, IEEC's CTGs would be equipped with dry, low nitrogen oxides (NOx) combustors to control NOx concentrations through a process of staged combustion and the pre-mixing of fuel and air immediately prior to combustion. IEEC would also be equipped with best available control technology (BACT), including an oxidation catalyst to limit carbon monoxide (CO) emissions and selective catalytic reduction (SCR) for control of nitrogen oxides (NOx). The SCR system consists of a reduction catalyst and an aqueous ammonia injection system.

A more complete description of the project is contained in the **PROJECT DESCRIPTION** section of this PSA.

PUBLIC AND AGENCY COORDINATION

The Energy Commission's IEEC Committee conducted an Informational Hearing and Site Visit on January 30, 2002. This hearing provided a forum for the public to learn about the project, the Energy Commission's process, and to raise their questions and concerns about the proposed power plant. Additionally, on February 26, 2002, staff conducted a Data Response and Issue Resolution workshop to discuss technical issues and exchange information with the applicant, intervenors, and members of the public in the areas of air quality, hazardous materials, land use, noise, and public health. In addition, staff explained its analysis approach to issues of environmental justice.

Staff worked with Riverside County in the review of local LORS applicable to the project. The Riverside County Planning Department provided a letter discussing the conformance of the proposed IEEC and ancillary facilities with local land use designations and other relevant LORS, including a list of proposed conditions that would be applicable if the project were permitted by the County. Staff has considered the County's letter and proposed conditions during analysis of the project as appropriate.

For a more detailed discussion of Riverside County's letter and proposed conditions, please see the **LAND USE** section of this document.

Staff also coordinated with relevant local, state and federal agencies, such as the California Independent System Operator, the South Coast Air Quality Management District (SCAQMD), the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, the California Department of Fish and Game, and the California Department of Education. In addition, staff also coordinated with the Romoland School District, an intervenor in the case. This PSA provides agencies and the public the opportunity to review the Energy Commission staff's analysis of the proposed project.

Written comments on this PSA will be taken into consideration by the staff in preparing the Final Staff Assessment (FSA).

STAFF'S ASSESSMENT

Each technical area section of the PSA contains a discussion of impacts, staff's preliminary conclusions and recommendations, and, where appropriate, mitigation measures and conditions of certification. The PSA includes staff's assessments of:

- the environmental setting of the proposal;
- impacts on public health and safety, and measures proposed to mitigate these impacts;
- environmental impacts, and measures proposed to mitigate these impacts;
- the engineering design of the proposed facility, and engineering measures proposed to ensure the project can be constructed and operated safely and reliably;
- project closure;
- project alternatives; and
- compliance of the project with all applicable laws, ordinances, regulations and standards (LORS) during construction and operation.

OVERVIEW OF STAFF'S CONCLUSIONS

Environmental / System Impacts and LORS

Staff's preliminary analysis indicates that, with the exception of Air Quality, the project's environmental impacts can be mitigated to levels of less than significant, and that the project can be made to conform with all LORS. Staff has not completed its assessment of visual plumes, and may recommend additional mitigation if significant impacts are identified. Below is a table summarizing the potential environmental impacts and LORS compliance for each technical area. Air quality and visual resources are discussed in more detail following the table.

Technical Discipline	Environmental / System Impact	LORS Conformance
Air Quality	Staff cannot conclude	Requires complete offset package
Biological Resources	Impacts mitigated	Yes
Cultural Resources	Impacts mitigated	Yes
Power Plant Efficiency	No impact	N/A
Power Plant Reliability	No impact	N/A
Facility Design	N/A	Yes
Geology	Impacts mitigated	Yes
Hazardous Materials	Impacts mitigated	Yes
Land Use	Impacts mitigated	Yes
Noise	Impacts mitigated	Yes
Public Health	Impacts mitigated	Yes
Socioeconomics	Impacts mitigated	Yes
Traffic and Transportation	Impacts mitigated	Yes
Transmission Line Safety	Impacts mitigated	Yes
Transmission System Engineering	Impacts mitigated	Yes
Visual Resources	Staff cannot conclude	Yes
Waste Management	Impacts mitigated	Yes
Water and Soils	Impacts mitigated	Yes
Worker Safety	Impacts mitigated	Yes

The following summarizes staff's position with respect to the technical areas listed as "Staff cannot conclude":

Air Quality

A number of significant air quality issues remain unresolved that have the potential to delay the overall project schedule and have impacted staff's ability to draw conclusions in the PSA.

- The applicant does not currently have a complete offset package that satisfies routine SCAQMD permitting requirements or the Energy Commission staff need for CEQA mitigation (see **AIR QUALITY Table 16**). Because the offset package is substantially undefined, Energy Commission staff and the public cannot review or comment on the complete strategy at this time. Staff has determined that the project as proposed is currently not in compliance with the SCAQMD offset rules.
- Additionally, current information indicates that the IEEC is likely to need access to SCAQMD's Priority Reserve program for a portion of its emissions offsets. This project will need to meet a number of requirements to gain access to the program, including a requirement to be online within three years of permitting. Staff is currently uncertain whether the project will be able to meet these requirements. If it cannot, it may be difficult for the project to obtain adequate offsets to meet SCAQMD requirements.
- The BACT determination of the Preliminary Determination of Compliance (PDOC) appears to be inconsistent with recent U.S. EPA guidance that has identified more

stringent NOx and CO levels as being demonstrated in practice. The U.S. EPA is expected to provide comment on the BACT decision of the PDOC. Until U.S. EPA participation occurs, staff cannot determine that IEEC is in compliance with the SCAQMD rules for BACT.

Staff cannot recommend certification of the IEEC project at this time. The applicant needs to meet the offset and BACT requirements of the District for the District to complete its Final Determination of Compliance (FDOC). Additionally, the applicant needs to provide the staff-recommended CEQA mitigation (in **AQ-C13** or an appropriate alternative strategy) for PM_{10} impacts from the cooling tower.

Visual Resources

Staff has proposed conditions of certification that would mitigate visual impacts of the project structures to less than significant levels if effectively implemented. Staff will hold a workshop to discuss the feasibility of specific approaches to landscape screening to meet the requirements of these conditions. In addition, staff has not completed its assessment of the visual impacts of the project's plumes, and may propose additional mitigation for those impacts after assessment is complete.

Environmental Justice

EPA guidelines on environmental justice state that if 50 percent of the population affected by a project has minority or low-income status, it must be determined if these populations are exposed to disproportionately high and adverse human health or environmental impacts.

In the Socioeconomics section of this report, staff presents the results of their "environmental justice screening analysis." The purpose of this analysis is to determine whether of not a low-income and/or minority population exists within the potential affected area of the proposed site.

Socioeconomics Figure 1 identifies census blocks within six miles of the proposed project that had minority populations greater than 50 percent. Within the six-mile radius of the site, 54.8 percent of the total population is white, while the remaining 45.2 percent are people of color. Within this radius there are multiple census blocks with a greater than 50 percent minority population, most of which are associated with the communities of Perris and Romoland. Within a one-mile radius of the IEEC site, 64 percent of the population is minority. However, these census blocks are sparsely populated, except for the community of Romoland. Conversely, within a two-mile radius of the project site, the minority population percentage decreases to 34 percent.

Although the minority population within six-miles of the project site is less than 50 percent, some census blocks, or pockets, within this radius have greater than 50 percent minority population. Staff considers these pockets to require a focused Environmental Justice analysis. When a minority and/or low-income population is identified, staff in the technical areas of air quality, public health, hazardous materials, noise, water, waste, traffic and transportation, visual resources, land use, socioeconomics and transmission line safety and nuisance must consider possible impacts on the minority/low-income population as part of their analysis. This

environmental justice (EJ) analysis consists of identification of significant impacts (if any), identification of mitigation, and determination of whether there is a disproportionate impact if an unmitigated significant impact has been identified.

Based on its preliminary analysis, staff has not identified any significant unmitigated impacts for the subjects listed above except air quality. The primary air quality impacts of concern are from PM_{10} emissions. These occur primarily close to the project site during construction, and staff's proposed mitigation measures are adequate to reduce those impacts to less than significant levels. The operation impacts, which will not be fully mitigated until the applicant develops a full emission offset package, occur in the more distant hills away from the minority population clusters. Staff therefore believes that there are no environmental justice issues with this project as mitigated, but will revisit this issue in the FSA.

CONCLUSION AND RECOMMENDATIONS

Staff cannot recommend approval of IEEC at this time due to unresolved LORS compliance and environmental mitigation issues. As discussed above, the applicant will need to demonstrate its ability to meet the offset and BACT requirements that will be included in the FDOC. In particular, staff is concerned about the availability of adequate offsets outside of the SCAQMD Priority Reserve program, or the ability of IEEC to qualify for that program.

For visual resources, staff has proposed conditions of certification that would mitigate visual impacts of the project structures to less than significant levels if effectively implemented. Staff will hold a workshop to discuss the feasibility of specific approaches to landscape screening to meet the requirements of these conditions. In addition, staff has not completed its assessment of the visual impacts of the project's plumes, and may propose additional mitigation for those impacts after assessment is complete.

Staff will work to resolve as many of these concerns as possible and address comments received prior to release of the FSA through one or more workshops.

INLAND EMPIRE POWER PLANT PROJECT
PRELIMINARY STAFF ASSESSMENT

EXECUTIVE SUMMARY 1

INTRODUCTION 2

PROJECT DESCRIPTION 3

ENVIRONMENTAL ASSESSMENT

- AIR QUALITY 4.1
- BIOLOGICAL RESOURCES 4.2
- CULTURAL RESOURCES 4.3
- HAZARDOUS MATERIALS 4.4
- LAND USE 4.5
- NOISE AND VIBRATION 4.6
- PUBLIC HEALTH 4.7
- SOCIOECONOMIC RESOURCES 4.8
- SOIL AND WATER RESOURCES 4.9
- TRAFFIC AND TRANSPORTATION 4.10
- TRANSMISSION LINE SAFETY AND NUISANCE 4.11
- VISUAL RESOURCES 4.12
- WASTE MANAGEMENT 4.13
- WORKER SAFETY 4.14

ENGINEERING ASSESSMENT

- FACILITY DESIGN 5.1
- GEOLOGY AND PALEONTOLOGY 5.2
- POWER PLANT EFFICIENCY 5.3
- POWER PLANT RELIABILITY 5.4
- TRANSMISSION SYSTEM ENGINEERING 5.5

ALTERNATIVES 6

GENERAL CONDITIONS 7

PREPARATION TEAM 8

INTRODUCTION

James A. Bartridge

PURPOSE OF THIS REPORT

The Preliminary Staff Assessment (PSA) presents the California Energy Commission (Energy Commission) staff's independent analysis of the Inland Empire Energy Center, LLC Application for Certification (AFC). The PSA is a staff document. It is neither a Committee document, nor a draft decision. The PSA describes the following:

- the existing environmental setting;
- the proposed project;
- whether the facilities can be constructed and operated safely and reliably in accordance with applicable laws, ordinances, regulations and standards (LORS);
- the environmental consequences of the project including potential public health and safety impacts;
- cumulative analysis of the potential impacts of the project, along with potential impacts from other existing and known planned developments;
- mitigation measures proposed by the applicant, staff, interested agencies and intervenors that may lessen or eliminate potential impacts;
- the proposed conditions under which the project should be constructed and operated, if it is certified;
- project alternatives; and
- requirements for project closure.

The analyses contained in this PSA are based upon information from: 1) the AFC; 2) subsequent submittals; 3) responses to data requests; 4) supplementary information from local and state agencies and interested individuals; 5) existing documents and publications; and 6) independent field studies and research. The analyses for most technical areas include discussions of proposed conditions of certification. Each proposed condition of certification is followed by a proposed means of "verification." The verification is not part of the proposed condition, but is the Energy Commission Compliance Unit's method of ensuring post-certification compliance with adopted requirements.

The Energy Commission staff's analyses were prepared in accordance with Public Resources Code section 25500 et seq. and Title 20, California Code of Regulation section 1701 et seq., and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.).

ORGANIZATION OF THE STAFF ASSESSMENT

The PSA contains an Executive Summary, Introduction, Project Description,

and Project Alternatives. The environmental, engineering, and public health and safety analysis of the proposed project is contained in a discussion of 19 technical areas. Each technical area is addressed in a separate chapter. They include the following: air quality, public health, worker safety and fire protection, transmission line safety, hazardous material management, waste management, land use, traffic and transportation, noise, visual resources, cultural resources, socioeconomics, biological resources, soil and water resources, geological and paleontological resources, facility design, power plant reliability, power plant efficiency, and transmission system engineering. These chapters are followed by a discussion of facility closure, project construction and operation compliance monitoring plans, and a list of staff that assisted in preparing this report.

Each of the 19 technical area assessments includes a discussion of:

- laws, ordinances, regulations and standards (LORS);
- the regional and site-specific setting;
- project specific and cumulative impacts;
- mitigation measures;
- closure requirements;
- conclusions and recommendations; and
- conditions of certification for both construction and operation (if applicable).

ENERGY COMMISSION SITING PROCESS

The California Energy Commission has the exclusive authority to certify the construction and operation of thermal electric power plants 50 megawatts (MW) or larger. The Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, section 25500). The Energy Commission must review power plant AFCs to assess potential environmental and public health and safety impacts , potential measures to mitigate those impacts (Pub. Resources Code, section 25519), and compliance with applicable governmental laws or standards (Pub. Resources Code, section 25523 (d)).

The Energy Commission's siting regulations require staff to independently review the AFC and assess whether the list of environmental impacts contained is complete, and whether additional or more effective mitigation measures are necessary, feasible and available (Cal. Code Regs., tit. 20, sections 1742 and 1742.5(a)). Staff's independent review shall be presented in a report (Cal. Code Regs., tit. 20 , section 1742.5).

In addition, staff must assess the completeness and adequacy of the health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, section 1743(b)). Staff is required to coordinate with other agencies to ensure that applicable laws, ordinances, regulations and standards are met (Cal. Code Regs., tit. 20, section 1744(b)).

Staff conducts its environmental analysis in accordance with the requirements of the California Environmental Quality Act. No Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been certified by the Resources Agency (Pub. Resources Code, section 21080.5 and Cal. Code Regs., tit. 14, section 15251 (k)). The Energy Commission acts in the role of the CEQA lead agency and is subject to all other applicable portions of CEQA.

Staff typically prepares both a preliminary and final staff assessment. The Preliminary Staff Assessment (PSA) presents for the applicant, intervenors, agencies, other interested parties and members of the public, the staff's preliminary analysis, conclusions, and recommendations.

Staff uses the PSA to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. During the period between publishing the PSA and the Final Staff Assessment (FSA), staff will conduct one or more workshops in the project area (Perris / Romoland) to discuss their findings, proposed mitigation, and proposed compliance monitoring requirements. Based on the workshops and written comments, staff will refine their analysis, correct errors, and finalize conditions of certification to reflect areas where staff has reached agreement with the parties. This refined analysis, along with responses to written comments on the PSA, will be published in the FSA. The FSA serves as staff's testimony on a proposal.

This staff assessment is only one piece of evidence that will be considered by the Committee (two Commissioners who have been assigned to this project) in reaching a decision on whether or not to recommend that the full Energy Commission approve the proposed project. At the public hearings, all parties will be afforded an opportunity to present evidence and to rebut the testimony of other parties, thereby creating a hearing record on which a decision on the project can be based. The hearing before the Committee also allows all parties to argue their positions on disputed matters, if any, and it provides a forum for the Committee to receive comments from the public and other governmental agencies.

Following the hearings, the Committee's recommendation to the full Energy Commission on whether or not to approve the proposed project will be contained in a document entitled the Presiding Members' Proposed Decision (PMPD). Following publication, the PMPD is circulated in order to receive written public comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. A revised PMPD will be circulated for a comment period to be determined by the committee. At the close of the comment period for the revised PMPD, the PMPD is submitted to the full Energy Commission for a decision. Within 30 days of the Energy Commission decision, any intervenor may request that the Energy Commission reconsider its decision.

A Compliance Monitoring Plan and General Conditions will be assembled from conditions contained in the FSA and other evidence presented at the hearings. The Compliance Monitoring Plan and General Conditions will be presented in the PMPD. Commission staff's implementation of the plan ensures that a certified facility is constructed, operated, and closed in compliance with the conditions adopted by the Energy Commission. Staff's proposed description of the contents of the Compliance

Monitoring Plan and proposed General Conditions are included in the **GENERAL CONDITIONS** section of this PSA.

Agency Coordination

As noted above, the Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, section 25500). However, the Commission typically seeks comments from and works closely with other regulatory agencies that administer LORS that may be applicable to proposed projects.

On March 5, 2002, the Riverside County Board of Supervisors approved a letter from the Planning Department that analyzed the proposed IEEC and ancillary facilities for conformance with local land use designations and other relevant LORS. The County's letter described those authorizations that would be required if the IEEC project were under their jurisdiction, including a list of proposed conditions that would be applicable under such circumstances. Staff has reviewed the County's letter and proposed conditions. Staff believes that the conditions of certification proposed in this PSA adequately address the conditions and concerns raised by the County. Staff has explicitly included discussion of the County's letter and proposed conditions in areas where appropriate and recommended including conditions of certification at least as stringent as that proposed by the County where applicable. Staff has also included specific conditions of certification requiring payment of the various mitigation fees typically imposed by the County for this type of industrial project.

For a more detailed discussion of Riverside County's letter and proposed conditions, please refer to the **EXECUTIVE SUMMARY** and **LAND USE** sections of this document. Staff's proposed description of the contents of the Compliance Monitoring Plan and proposed General Conditions are included in the **GENERAL CONDITIONS** section of this PSA.

PROJECT DESCRIPTION

James A. Bartridge

INTRODUCTION

On August 17, 2001, Inland Empire Energy Center, LLC filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) to construct and operate the Inland Empire Energy Center ("IEEC" or "the project") near the Community of Romoland in the County of Riverside. The Energy Commission determined the application to be data adequate on December 19, 2001. This determination initiated staff's independent analysis of the proposed project.

The IEEC project and related facilities such as the electric transmission lines, water supply lines and wastewater lines, are under the Energy Commission's jurisdiction. When issuing a license, the Energy Commission acts as lead state agency under the California Environmental Quality Act (CEQA), and its process is certified by the State Resources Agency as a separate program that satisfies the core CEQA requirements.

DESCRIPTION

GENERAL

The proposed IEEC project would be operated as a merchant power facility, with electric output and operational levels varying according to demand in the deregulated California energy market. Electricity prices and operational levels would not be subject to California Public Utilities Commission (CPUC) regulation. Calpine estimates the capital cost of the IEEC project to be between $300 and $400 million; as proposed, project construction would occur within a 24 month timeframe. If the project were certified under the current schedule, the estimated online date for IEEC commercial operations would be in the first quarter of 2005.

LOCATION

The proposed IEEC site is located in Riverside County near the communities of Romoland and Sun City, in an unincorporated portion of Riverside County (see **PROJECT DESCRIPTION Figure 1**). The project site is approximately six miles west of the City of Hemet, four miles east of the City of Perris, and 30-miles southeast of the City of Riverside (see **PROJECT DESCRIPTION Figure 2**). The 46-acre site is bordered by Ethanac Road and the Burlington Northern Santa Fe (BNSF) railway to the north, Antelope Road to the west, McLaughlin Road to the south, and San Jacinto Road to the east.

Proposed Project and Linear Facilities

The proposed IEEC project would be a natural-gas-fired, combined-cycle generating facility with a nominal gross generating capacity of 670 megawatts (MW). The proposed facility would include two GE PG 7251(FB) combustion turbine-generators (CTGs) with two heat recovery steam generators (HRSG), a single steam turbine-generator (STG), and a 14-cell mechanical draft evaporative cooling tower. Each

HRSG unit would have a single 195 foot exhaust stack equipped with duct burners, to provide additional steam production when increased electric power generation is necessary. Additional equipment would include an auxiliary boiler, a 1,000-kW natural-gas-fired emergency generator, and a 370-horsepower diesel fire pump, as well as the following:

- an ammonia storage and loading area;
- administration, maintenance, water treatment, and control buildings;
- miscellaneous storage tanks associated with the water treatment system;
- administration, maintenance, water treatment, and control buildings; and
- emission control equipment.

To control emissions of air pollutants, IEEC's CTGs would be equipped with dry, low nitrogen oxides (NOx) combustors to control NOx concentrations through a process of staged combustion and the pre-mixing of fuel and air immediately prior to combustion. IEEC would also be equipped with best available control technology (BACT), including an oxidation catalyst to limit carbon monoxide (CO) emissions and selective catalytic reduction (SCR) for control of nitrogen oxides (Nox). The SCR system consists of a reduction catalyst and an aqueous ammonia injection system.

See **PROJECT DESCRIPTION Figures 3 through 9** for proposed linear facilities, visual simulations, site plan, and elevations. For more detailed information, please see the **FACILITY DESIGN** section of this document.

NATURAL GAS FUEL SUPPLY AND COMPRESSOR STATION

Natural gas would be supplied from a 0.9-mile pipeline that would be constructed to deliver fuel from an existing Sempra Energy gas transmission pipeline that runs along Menifee Road (located approximately one mile south-east of the project site). Delivery of gas from this source would require the construction and operation of a compressor station to maintain gas pressure in the Sempra pipeline south of the project site during periods of power plant operation. The compressor station and associated equipment would consist of a 4,000 square-foot compressor building, a 1,500 square foot electrical building, a variety of mechanical equipment, several small accessory structures, and a parking area. The compressor station site would occupy approximately 2.6 acres of a 6.7-acre parcel located southeast of the proposed project site, near the intersections of Rouse Road and Menifee Road.

WATER USE

The combined cycle units are proposed to use a maximum of 4.5 million gallons of water per day (gpd) or 5,000 acre feet per year. During the first five years of operation, the cooling and process water used at IEEC is projected to consist of recycled water (approximately 80 percent) supplied by Eastern Municipal Water District (EMWD) and raw water (approximately 20 percent) supplied by Metropolitan Water District (MWD). These water sources would be combined at EMWD's Moreno Valley Regional Water Reclamation Facility (MVRWRF), pumped south into an existing recycled water pipeline that eventually runs along McLaughlin Road, and finally delivered to the IEEC via a new

0.1-mile pipeline. After five years, it is projected that cooling and process water used at IEEC would consist of 100 percent recycled water supplied by EMWD. Potable water for drinking and other facility uses would be supplied through an existing EMWD pipeline located along Antelope Road, connecting to the project via a new 0.1-mile pipeline. Disposal of wastewater would require a new 4.7-mile non-reclaimable wastewater pipeline, which would be constructed within existing utility right-of-ways along McLaughlin Road and Murrietta Road and connect with existing EMWD facilities located in the community of Sun City.

TRANSMISSION INTERCONNECT

The IEEC would interconnect with the electrical grid from an on-site switchyard through a new transmission line to the existing SCE Valley Substation located approximately 0.9 miles east of the project site. The proposed transmission line would be a 0.9 mile 500-kilovolt (kV) overhead line that would utilize new single and double-circuit steel lattice towers to connect to the existing substation.

PROJECT DESCRIPTION Figure 1
Inland Empire Energy Center Project

Regional Location

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inland_regional setting.jpg

PROJECT DESCRIPTION Figure 2
Inland Empire Energy Center Project

Local Map

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inland_local setting.jpg

PROJECT DESCRIPTION Figure 3
Inland Empire Energy Center Project

Project Linears

Calpine Figure

PROJECT DESCRIPTION Figure 4
Inland Empire Energy Center Project

Photo of Existing Project Site

Insert AFC **Figure 5.10-9a**

PROJECT DESCRIPTION Figure 5
Inland Empire Energy Center Project

Photo Simulation of the Plant Site with the Proposed IEEC

Insert AFC **Figure 5.10-9b**

PROJECT DESCRIPTION Figure 6
Inland Empire Energy Center Project

Aerial Simulation

Insert AFC **Figure 3.4-3**

PROJECT DESCRIPTION Figure 7
Inland Empire Energy Center Project

Facility Layout

Insert Data Response Figure 56-1 (revised site plan)

PROJECT DESCRIPTION Figure 8
Inland Empire Energy Center Project

Elevations

Insert AFC **Figure 3.4-1**

PROJECT DESCRIPTION Figure 9
Inland Empire Energy Center Project

Elevations

Insert AFC **Figure 3.4-2**

REFERENCES

Calpine (Calpine Corporation/Hatfield). 2001a. Inland Empire Energy Center, Application for Certification (01-AFC-17). Submitted to the California Energy Commission, August 17, 2001.

Calpine (Calpine Corporation/Thomas). 2001e. Data Adequacy Responses. Submitted to the California Energy Commission, December 4, 2001.

FWEC (Foster Wheeler Environmental Corp/Booth). 2002c. Data Response to CEC staff Data Requests dated 01/14/2002. Submitted to the California Energy Commission, February 21, 2002.

IEEC (Inland Empire Energy Center LLC). 2002e. Visual Simulation. Submitted to the California Energy Commission, February 13, 2002.

Riverside (County of Riverside/Buster). 2002a. Response to CEC request for input in IEEC and LORS (local land use laws, ordinances, regulations and standards. Submitted to the California Energy Commission, March 13, 2002.

AIR QUALITY

Brewster Birdsall

INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the construction and operation of the proposed Inland Empire Energy Center (IEEC), near Romoland, Riverside County, in the South Coast Air Basin.

In carrying out the analysis, the California Energy Commission staff evaluated the following major points:

- whether the IEEC is likely to conform with applicable Federal, State and South Coast Air Quality Management District (SCAQMD, or District) air quality laws, ordinances, regulations and standards (Title 20, California Code of Regulations, section 1744(b));
- whether the IEEC is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards and whether the mitigation proposed for the IEEC is adequate to lessen the potential impacts to a level of insignificance (Title 20, California Code of Regulations, section 1742(b)).

In carrying out this analysis, the California Energy Commission staff formatted the analysis using the major issues identified in the CEQA's Air Quality Checklist.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Under the Federal Clean Air Act (40 CFR 52.21), there are two major components of air pollution control requirements for stationary sources, nonattainment New Source Review (NSR) and Prevention of Significant Deterioration (PSD). Nonattainment NSR is a permitting process for evaluation of those pollutants that violate federal ambient air quality standards. Conversely, PSD is a permitting process for evaluation of those pollutants that do not violate federal ambient air quality standards. The PSD requirements apply only to those projects (known as major sources) that emit more than 250 tons per year for any pollutant, or any new facility or stationary source that is listed in the categories of 40 CFR Part 52.21(b)(1)(i)(a), and emits 100 tons per year or more of any criteria pollutant. A major modification at an existing major source which results in an emission increase of 100 tons per year for carbon monoxide (CO), 40 tons per year for oxides of nitrogen (NOx), sulfur dioxide (SO_2) or volatile organic compounds (VOC, also regulated as reactive organic gases, ROG), or 15 tons per year for particulate matter less than ten microns in diameter (PM_{10}) will also be subject to PSD review. The entire program, including both nonattainment NSR and PSD reviews, is referred to as the federal NSR program. Where air quality is regulated by local

jurisdictions, the U.S. Environmental Protection Agency (U.S. EPA) determines the conformance of the local regulations with the federal regulations.
Title V of the federal Clean Air Act requires states to implement and administer an operating permit program to ensure that large sources operate in compliance with the requirements included in 40 CFR Part 70. A Title V permit contains all of the requirements specified in different air quality regulations that affect an individual project. As a new major source, the IEEC will require a Title V permit.

The IEEC is also subject to the federal New Source Performance Standards (NSPS) for the combustion turbines (40 CFR 60 Subpart GG) and heat recovery steam generators (Subpart Da). These regulations have pollutant emission requirements that are less stringent than those that will be required by NSR requirements for best available control technology (BACT).

The U.S. EPA reviews and approves the SCAQMD regulations and has delegated to the SCAQMD the implementation of the federal NSR, Title V, and NSPS programs. The District implements these programs through its own rules and regulations, which are as stringent as the federal regulations. The Title V program is administered by the District under Regulation XXX. In addition, the U.S. EPA has delegated to the District the authority to implement the federal Clean Air Act Title IV "acid rain" program. The Title IV regulation requirements will include obtaining a Title IV permit prior to operation, the installation of continuous emission monitors to monitor acid deposition precursor pollutants, and obtaining Title IV allowances for emissions of SOx. Regulation XXXI implements the federal Title IV program. Therefore, compliance with the District's rules and regulations will result in compliance with federal requirements.

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 – SCAQMD

As part of the Energy Commission's licensing process, in lieu of issuing a construction permit to the applicant for the IEEC, the SCAQMD will prepare and present to the Commission a Determination of Compliance/Permit to Construct (DOC/PTC). The DOC will evaluate whether and under what conditions the proposed project will comply with the District's applicable rules and regulations, as described below.

The proposed project is subject to the following SCAQMD Rules and Regulations:

Regulation II – Permits

This regulation sets forth the regulatory framework of the application for and issuance of construction and operation permits for new, altered and existing equipment.

RULE 202 – TEMPORARY PERMIT TO OPERATE

This rule states that any new equipment that has been issued a Permit to Construct (PTC) shall be allowed to use that PTC as a temporary Permit to Operate (PTO) until a PTO is issued or denied by the District. Notification of the SCAQMD Air Pollution Control Officer (APCO) is required before operating under this rule.

RULE 203 – PERMIT TO OPERATE

This rule prohibits the use of any equipment that may emit air contaminants or control the emission of air contaminants, without first obtaining a PTO except as provided in Rule 202.

RULE 217 – PROVISIONS FOR SAMPLING AND TESTING

The Executive Officer may require the applicant to provide and maintain facilities necessary for sampling and testing. The SCAQMD Executive Officer will inform the applicant of the need for testing ports, platforms and utilities.

RULE 218 – CONTINUOUS EMISSION MONITORING

This rule describes the installation, quality assurance/ quality control (QA/QC) and reporting requirements for all sampling interfaces, analyzers and data acquisition systems used to continuously determine the concentration or mass emission of an emission source. However, this rule does not apply to the CEMS required for NOx monitoring under RECLAIM (Regulation XX).

Regulation IV – Prohibitions

This regulation sets forth the restrictions for visible emissions, odor nuisance, fugitive dust, various air emissions, fuel contaminants, start-up/shutdown exemptions and breakdown events.

RULE 401 – VISIBLE EMISSIONS

Generally this rule restricts visible emissions from a single source for more than three minutes in any one hour from being as dark or darker than that designated on the No. 1 Ringelmann Chart.

RULE 402 – NUISANCE

This rule restricts the discharge of any contaminant in quantities that cause or have a natural ability to cause injury, damage, nuisance or annoyance to businesses, property or the public.

RULE 403 – FUGITIVE DUST

This rule requires that the applicant prevent, reduce or mitigate fugitive dust emissions from the project site. Rule 403 restricts visible fugitive dust to the project property line, restricts the net PM_{10} concentrations (between up- and down-wind measurements) to less than 50 $\mu g/m^3$ and restricts the tracking out of bulk materials onto public roads. Additionally, the applicant must utilize one or more of the best available control measures (identified within Rule 403, Tables 1 and 2). An exemption from the 50 $\mu g/m^3$ up- and down-wind ambient limit if dust control actions (from Rule 403, Table 2) are

implemented on a routine basis and records reflecting dust control practices are maintained. Mitigation measures may include adding freeboard to haul vehicles, covering loose material on haul vehicles, watering, using chemical stabilizers and/or ceasing all activities. Finally, a contingency plan maybe required if so determined by the U.S. EPA.

RULE 407 – LIQUID AND GASEOUS AIR CONTAMINANTS

This rule limits CO emissions to 2,000 ppm and SO_2 emissions to 500 ppm, averaged over 15 minutes. Stationary internal combustion engines are exempt from limits in the rule, and equipment that complies with Rule 431.1 is exempt from the SO_2 limit. The applicant will be required to comply with Rule 431.1 and thus the sulfur limit of Rule 407 will not apply.

RULE 408 – CIRCUMVENTION

This rule prohibits the use of equipment that conceals emissions without reducing emissions, except in cases where the only violation involved is of Section 48700 of the Health and Safety Code or District Rule 402.

RULE 409 – COMBUSTION CONTAMINANTS

This rule restricts the discharge of contaminants from the combustion of fuel to 0.23 grams per cubic meter of gas, calculated to 12 % CO2, averaged over 15 minutes. This rule does not apply to IC engines or jet engine test stands.

RULE 431.1 – SULFUR CONTENT OF GASEOUS FUELS

This rule restricts the sale or use of gaseous fuels that exceed a sulfur content limit. The sulfur content limit for natural gas is 16 ppmv calculated as H_2S. This rule also establishes monitoring and reporting requirements, as well as test methods to be used.

RULE 431.2 – SULFUR CONTENT OF LIQUID FUELS

This rule establishes a sulfur content limit for diesel fuel of 0.05 percent by weight, including record keeping requirements and test methods.

RULE 474 – FUEL BURNING EQUIPMENT – OXIDES OF NITROGEN

This rule establishes limits for emissions of NOx from stationary combustion sources. NOx RECLAIM facilities regulated under Regulation XX are exempt from the provisions of Rule 474 (Rule 2001).

RULE 475 – ELECTRIC POWER GENERATING EQUIPMENT

This rule limits combustion contaminants (PM_{10}) from electric power generating equipment, with a maximum rating of more than 10 net megawatts, to 11 pounds per hour or 23 milligrams per cubic meter @ 3 % O_2 (0.01 grain/SCF) with the pollutant averaging time subject to SCAQMD Executive Officer decision.

RULE 476 – STEAM GENERATING EQUIPMENT

This rule establishes limits for emissions of NOx and other combustion contaminants (PM_{10}) from steam generating equipment. NOx RECLAIM facilities regulated under

Regulation XX are exempt from the NOx provisions of Rule 476 (Rule 2001). The PM_{10} provisions of Rule 475 are equivalent to the PM_{10} provisions of this rule.

ADDENDUM TO REGULATION IV – RULE 53 – SPECIFIC AIR CONTAMINANTS

Prohibits discharge of sulfur compounds from any stationary source in levels exceeding 500 ppm. Compliance with fuel limitations in Rules 431.1 and 431.2 would ensure compliance with this rule.

Regulation VII – Emergencies

RULE 701 – AIR POLLUTION EMERGENCY CONTINGENCY ACTIONS

This rule requires that facilities employing 100 or more people or emitting 100 or more tons of pollutants (NOx, SOx or VOC) per year, upon declaration or prediction of a Stage 2 or 3 episode, reduce NOx, SOx and VOC emissions by at least 20 percent of normal workday operations. This rule also requires that upon declaration of a state of emergency by the Governor, the facility comply with the Governor's requirements. A power plant facility may be exempt from Rule 701 if they are determined by the District to be an essential service responding to a public emergency or utility outage.

Regulation IX – Standards Of Performance For New Stationary Sources

Regulation IX incorporates provisions of Part 60, Chapter I, Title 40 of the Code of Federal Regulations (CFR) and is applicable to all new, modified or reconstructed sources of air pollution. Sections of this regulation apply to electric utility steam generators (Subpart Da) and stationary gas turbines (Subpart GG). These subparts establish limits of particulate matter, SO_2, and NO_2 emissions from the facility as well as monitoring and test method requirements.

Regulation XI – Source Specific Standards

RULE 1110.1 – EMISSIONS FROM STATIONARY INTERNAL COMBUSTION ENGINES

This rule generally applies to engines larger than 50 brake horsepower (bhp) and places restriction on rich-burn or lean-burn engines. These restrictions are in the form of NOx and CO emission limits and the required submittal of a control plan to demonstrate compliance. Emergency standby engines, operating less than 200 hours per year are exempt from Rule 1110.1.

RULE 1110.2 – EMISSIONS FROM GAS AND LIQUID FUELED ENGINES

This rule establishes NOx, VOC and CO emissions limits for stationary and portable engines over 50 bhp in rated capacity. Emergency standby engines, operating less than 200 hours per year are exempt from Rule 1110.2.

RULE 1134 – EMISSIONS OF OXIDES OF NITROGEN FROM STATIONARY GAS TURBINES

This rule establishes limits for emissions of NOx from stationary gas turbines. NOx RECLAIM facilities regulated under Regulation XX are exempt from the provisions of Rule 1134 (Rule 2001).

RULE 1135 – EMISSIONS OF OXIDES OF NITROGEN FROM ELECTRIC POWER GENERATING SYSTEMS

This rule establishes limits for emissions of NOx from electricity generating systems. NOx RECLAIM facilities regulated under Regulation XX are exempt from the provisions of Rule 1135 (Rule 2001).

RULE 1146 – EMISSIONS OF OXIDES OF NITROGEN FROM INDUSTRIAL, INSTITUTIONAL, AND COMMERCIAL BOILERS, STEAM GENERATORS, AND PROCESS HEATERS

This rule establishes limits for emissions of NOx and CO from industrial, institutional, and commercial steam generating units. However, heat recovery steam generators used to generate electricity from the waste heat of combustion turbines are exempt from the regulation. Additionally, NOx RECLAIM facilities regulated under Regulation XX are exempt from the provisions of Rule 1146 (Rule 2001).

Regulation XIII – New Source Review

This regulation sets forth the pre-construction review requirements for new, modified or relocated facilities to ensure that these facilities do not interfere with progress in attainment of the national ambient air quality standards and that future economic growth in the SCAQMD is not unnecessarily restricted. This regulation limits the emissions of nonattainment contaminants and their precursors as well as ozone depleting compounds (ODC) and ammonia by requiring the use of Best Available Control Technologies (BACT). However, this regulation does not apply to NOx or SOx emissions from power generating facilities that opt into the RECLAIM program (Regulation XX, below) for either or both of these pollutants.

RULE 1303 – REQUIREMENTS

Approval of the Permit to Construct for any source of a nonattainment contaminant, ozone precursor, or ammonia requires installation of BACT, which for major sources would be at least as stringent as the Lowest Achievable Emissions Rate. Additionally, this rule specifies that applicants for permits of new and modified major stationary sources substantiate air quality impacts analyses with dispersion modeling, conduct an analysis of plume visibility at Federal Class I areas, and demonstrate statewide compliance of facilities within the applicant's control.

RULE 1309.1 – PRIORITY RESERVE

The Priority Reserve provides credits for PM_{10}, SOx, and CO to specific priority sources. To be eligible, electric generating facilities must submit a complete application for certification to the California Energy Commission (CEC) between 2000 and 2003; be in compliance with all applicable District rules, variances, orders, and settlement

agreements; pay a non-refundable mitigation fee for each pound per day of PM_{10}, SOx, and CO obtained from the Priority Reserve; show due diligence effort to secure available ERCs; agree to be fully and legally operational within 3 years of the CEC decision; and enter into a long-term (at least 1-year) contract with the state of California to sell at least 50% of the portion of the power generated using Priority Reserve credits.

Regulation XIV – Toxics And Other Non-Criteria Pollutants

RULE 1401 – NEW SOURCE REVIEW OF TOXIC AIR CONTAMINANTS

The allowable risks caused by toxic air contaminants from new stationary sources are limited by Regulation XIV and the toxics new source review rules. These regulations are addressed in the **Public Health** section of this Staff Assessment.

Regulation XVII – Prevention Of Significant Deterioration

This regulation sets forth the pre-construction requirement for stationary sources to ensure that the air quality in clean air areas does not significantly deteriorate while maintaining a margin for future industrial growth. This regulation establishes maximum allowable increases over ambient baseline concentrations for each pollutant. PSD pollutants in the South Coast Air Basin portion of Riverside County are NO_2 and SO_2. Based on emissions from the proposed equipment provided in AFC Section 5.2.3.2.2 (Table 5.2-27, pg. 5.2-44, Calpine 2001a), the IEEC would qualify as a major new source of NO_2.

Regulation XX – Regional Clean Air Incentives Market (Reclaim)

The Regional Clean Air Incentives Market (RECLAIM) is designed to allow facilities flexibility in achieving emission reduction requirements for NOx and SOx through controls, equipment modifications, reformulated products, operational changes, shutdowns, other reasonable mitigation measures or the purchase of excess emission reductions. The RECLAIM program establishes an initial allocation (beginning in 1994) and an ending allocation (to be attained by the year 2003) for each facility within the program (Rule 2002). Each facility then reduces their allocation annually on a straight line from the initial to the ending. The RECLAIM program supercedes other district rules if there are conflicts. As a result, the RECLAIM program has its own rules for permitting, reporting, monitoring (including CEM), record keeping, variances, breakdowns, and the New Source Review program, which incorporates BACT requirements (Rules 2004, 2005, 2006 and 2012). RECLAIM also has its own banking rule, RECLAIM Trading Credits (RTCs), which is established in Rule 2007. The IEEC is exempt from the SOx RECLAIM program (Rule 2011) because it uses natural gas exclusively (per Rule 2001).

Regulation XXX – Title V Permits

The Title V federal program is the air pollution control permit system required by the federal Clean Air Act as amended in 1990. Regulation XXX defines the permit

application requirements and issuance as well as compliance requirements associated with the program. Any new or modified major source which qualifies as a Title V facility must obtain a Title V permit prior to construction, operation or modification of that source. Regulation XXX also integrates the Title V permit with the RECLAIM program such that a project cannot proceed without both permits. Toxic air contaminants are regulated through requirements for maximum available control technology (MACT) that are also implemented through Title V. The IEEC will be a major new source and thus will require a Title V permit.

Regulation XXXI – Acid Rain Permits

Title IV of the federal Clean Air Act provides for the issuance of acid rain permits for qualifying facilities. Regulation XXXI integrates the Title V program with the RECLAIM program. Regulation XXXI requires a subject facility to obtain emission allowances for SOx emissions as well as monitoring SOx, NOx and CO_2 emissions from the facility. Acid rain requirements are applicable to the IEEC project.

LOCAL – RIVERSIDE COUNTY LAND USE CONFORMITY

Riverside County provided a review of the relevant land use ordinance provisions for development of the project (Riverside 2002a). Certain provisions relate to air quality. Riverside County would require that all necessary measures to control dust be implemented by the applicant, including PM_{10} plans to reduce dust during grading, and that any impacts to the nearby Perris Union and Romoland School Districts be mitigated in accordance with California State Law. These provisions would apply to construction and operation of all project components.

SETTING

METEOROLOGICAL CONDITIONS

The general climate of California is typically dominated by the eastern Pacific high-pressure system centered off the coast of California. In the summer, this system results in low inversion layers and clear skies inland and typically early morning fog by the coast. In the fall, the Pacific High weakens and shifts southwestward toward Hawaii, allowing storms originating in the Gulf of Alaska to reach California. At weather stations in Sun City, within three miles of the site, and at Lake Elsinore, about ten miles southwest of the project site, the average annual rainfall is between 11 and 12 inches. Approximately 85 percent of the annual precipitation falls between November and March. Between storms, skies are fair, winds are light, and temperatures are moderate, with average summertime highs close to 100 ºF and average wintertime lows above freezing (WRCC 2001).

The large scale wind flow patterns in Southern California are a diurnal cycle driven by the differences in temperature between the land and the ocean and, near the surface, are channeled by the mountainous terrain. Based on the wind rose for the Riverside meteorological station, nearly 50 percent of all winds come from west through northwest. Calm conditions prevail about 12 percent of the time (AFC Figure 5.2-5 p.

5.2-13, Calpine 2001a). The project site is about 20 miles southeast of Riverside in the Perris Valley. Data collected in Perris shows that when compared to wind directions in Riverside, the local terrain causes prevailing wind at the site to have more north-northwesterly components and reverse flows, usually in the winter, that are from the south-southeast (R&T 2002b).

EXISTING AIR QUALITY

Air Quality Standards and Attainment Status

The project is located in the South Coast Air Basin portion of Riverside County within the jurisdiction of the South Coast Air Quality Management District. The applicable federal and California ambient air quality standards (AAQS) are presented in **AIR QUALITY Table 1**. As indicated in this table, the averaging times for the various air quality standards (the duration over which they are measured) range from hourly to annually. The standards are read as a mass fraction, in parts per million (ppm), or as a concentration, in milligrams or micrograms of pollutant per cubic meter of air (mg/m^3 and µg/m^3).

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 µg/m^3)	0.09 ppm (180 µg/m^3)
	8 Hour	0.08 ppm (160 µg/m^3)	—
Respirable Particulate Matter PM_{10})	AnnualGeometric Mean	—	30 µg/m^3
	24 Hour	150 µg/m^3	50 µg/m^3
	Annual Arithmetic Mean	50 µg/m^3	—
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	65 µg/m^3	—
	Annual Arithmetic Mean	15 µg/m^3	—
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 µg/m^3)	—
	1 Hour	—	0.25 ppm (470 µg/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)
Sulfur Dioxide (SO_2)	Annual Average	0.03 ppm (80 µg/m^3)	—
	24 Hour	0.14 ppm (365 µg/m^3)	0.04 ppm (105 µg/m^3)
	3 Hour	0.5 ppm (1300 µg/m^3)	—
	1 Hour	—	0.25 ppm (655 µg/m^3)
Sulfates (SO4(2-))	24 Hour	—	25 µg/m^3
Lead	30 Day Average	—	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	—
Hydrogen Sulfide(H_2S)	1 Hour	—	0.03 ppm (42 µg/m^3)
Vinyl Chloride (chloroethene)	24 Hour	—	0.010 ppm (26 µg/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.

The U.S. EPA, the California Air Resources Board (CARB), and the local air district classify an area as attainment, unclassified, or nonattainment, depending on whether or not the monitored ambient air quality data show compliance, insufficient data, or non-compliance with the ambient air quality standards, respectively. The IEEC is located in the Riverside County portion of the South Coast Air Basin. This area is designated as nonattainment for both the federal and state ozone and PM_{10} standards. **AIR QUALITY Table 2** summarizes federal and state attainment status of criteria pollutants for the Riverside County portion of the South Coast Air Basin.

AIR QUALITY Table 2
Federal and State Attainment Status for Riverside County, South Coast Air Basin

Pollutants	Federal Classification	State Classification
Ozone	Extreme Nonattainment	Extreme Nonattainment
PM_{10}	Serious Nonattainment	Nonattainment
NO_2	Unclassified/Attainment	Attainment
CO	Nonattainment	Attainment
SO_2	Attainment	Attainment

Note: Because of CO violations in Los Angeles County, portions of the South Coast Air Basin are designated nonattainment. The Federal Classification for CO nonattainment applies to the entire basin; state-level nonattainment for CO applies to only Los Angeles County.

Criteria Pollutant Air Quality Data

The ambient air quality data for the proposed project are available from the four nearest monitoring stations. No single station in the area measures all of the pollutants. A monitoring station in Perris, about four to five miles northwest of the project site, provides air quality data for ozone and PM_{10}. Nitrogen dioxide (NO_2) is recorded at Lake Elsinore, about 10 miles southwest of the project site. A monitoring station on Magnolia Street in Riverside, about 20 miles northwest of the project site provides carbon monoxide (CO) data, and another Riverside station, on Rubidoux Avenue, provides sulfur dioxide (SO_2) data. These stations are each located in areas that are similar to the project site in terms of terrain and level of development. Consequently, concentrations monitored at these locations are expected to be similar to what would be observed at the project site. For the analysis, the maximum criteria pollutant concentration from the five most recent complete years of reported data (1997-2001) was used for each limit as the background value. These values, as well as the most restrictive AAQS, either federal or state, are shown in **AIR QUALITY Table 3**.

AIR QUALITY Table 3
Ambient Air Quality Monitoring Data (ppm)

Pollutant -Location-	**Averaging Time**	**1997[a]**	**1998[a]**	**1999[a]**	**2000[b]**	**2001[b]**	**Most Restrictive Ambient Air Quality Standard**
Ozone	1 hour	0.079	0.149	0.112	0.164	0.152	0.09 (Cal.)
-Perris-	Days Exceeding 1 hour Standard	0	38	10	65	73	---
	8 hour	0.059	0.129	0.097	0.126	0.135	0.08 (Fed.)
PM_{10} ($\mu g/m^3$)	24 hour	139	98	112	87	79	50 (Cal.)
-Perris-	Days Exceeding 24 hour Standard[1]	144	84	180	78	48	---
	Annual Geometric Mean	38.5	33.3	44.0	36.7	33.0	30 (Cal.)
	Annual Arithmetic Mean	44.4	35.2	50.0	41.1	37.0	50 (Fed.)
NO_2	1 hour	0.106	0.084	0.114	0.078	0.146	0.25 (Cal.)
-Lake Elsinore-	Annual	0.0151	0.0165	0.0192	0.0170	---	0.053 (Fed.)
CO	1 hour	10.7	6.4	7.4	---	---	20 (Cal.)
-Magnolia St.-	8 hour	5.47	4.57	4.10	4.23	4.48	9 (Fed.)
SO_2	1 hour	0.04	0.03	0.03	0.11	---	0.25 (Cal.)
-Rubidoux Ave.-	24 hour	0.005	0.009	0.012	0.038	0.009	0.04 (Cal.)
	Annual	0.001	0.001	0.002	0.001	0.001	0.03 (Fed.)

Note: 1. Monitoring for the 24-hour PM_{10} standard is performed once every six days and the number of days exceeding the standard is calculated by multiplying the actual number of days by six.
2. No single station in the area monitors all pollutants. The representative station nearest the project site is used in each case.

Sources: a. CARB Air Quality Data CD, 2000.
b. CARB web site, http://www.arb.ca.gov/adam/welcome.html, accessed May 2002.

Fine Particulate Matter, $PM_{2.5}$

The air agencies in California are now deploying $PM_{2.5}$ ambient air quality monitors throughout the state to eventually determine attainment status. Region-specific $PM_{2.5}$ ambient air quality attainment plans, if needed, are due to the U.S. EPA by 2005. The SCAQMD would be responsible for developing an air quality management plan for $PM_{2.5}$, if the air basin is eventually designated as a nonattainment area.

High concentrations of $PM_{2.5}$ occur year-round in the South Coast Air Basin, and concentrations in the Riverside and Inland Empire areas are the highest monitored of any location in the basin (CARB Almanac, 2001). The chemical composition of the

particles shows that they are derived from a wide range of sources (including combustion sources, reactive precursors, geologic disruption, and natural events). Managing $PM_{2.5}$ concentrations will require identifying controllable sources and developing feasible source management strategies. Because PM_{10} includes $PM_{2.5}$ as a subset and reactive precursors that lead to ozone can also lead to $PM_{2.5}$, the established strategies for controlling PM_{10} and ozone precursors (including existing programs for combustion sources) also presently help to reduce $PM_{2.5}$ concentrations.

Secondary PM_{10}

PM_{10} is emitted directly from the combustion of any fossil fuel, and it can also be formed many miles downwind when precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NOx, SOx and VOC from combustion sources, and ammonia from NOx control equipment and agriculture, given the right meteorological conditions, can form particulate matters in the form of nitrates (NO_3), sulfates (SO_4), and organic particles. These pollutants are known as secondary particulates, because they are not directly emitted but are formed through complex chemical reactions in the atmosphere.

PM nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid originates from NOx emissions from combustion sources. In certain parts of the state, the nitrate-ion concentrations during the wintertime are a significant portion of the total PM_{10}, and it may be a more significant portion of the total $PM_{2.5}$. The nitrate ion is only a portion of the PM nitrate, which can be in the forms of ammonium nitrate (ammonium plus nitrate ions) and sodium nitrate.

Summary

AIR QUALITY Table 4 summarizes the recent air quality conditions for the project area. Staff recommends the background ambient concentrations of **Table 4** for use in the modeling and impacts analysis. These concentrations reflect the measurements from the nearest station and highest of the three most-recent years of data. With exceptions for NO_2 (1-hour) and SO_2 (1-hour and 24-hour), the applicant's analysis also uses these background concentrations (AFC Table 5.2-1, p. 5.2-3, Calpine 2001a).

AIR QUALITY Table 4
Staff Recommended Background Concentrations for IEEC Project Area

Pollutant	Averaging Time	Staff-Recommended Background (ppm)	Staff-Recommended Background ($\mu g/m^3$)	Limiting Standard (ppm)	Type of Standard
Ozone	1 hour	0.164	---	0.09	CAAQS
	8 hour	0.135	---	0.08	NAAQS
PM_{10}	24 hour	---	139	50 $\mu g/m^3$	CAAQS
	Annual Geometric Mean	---	44	30 $\mu g/m^3$	CAAQS
	Annual Arithmetic Mean	---	50	50 $\mu g/m^3$	NAAQS
NO_2	1 hour (1)	0.146	274	0.25	CAAQS
	Annual	0.0192	36	0.053	NAAQS
CO	1 hour	7.4	12,650	20	CAAQS
	8 hour	4.48	6,302	9	NAAQS
SO_2	1 hour (1)	0.11	288	0.25	CAAQS
	3 hour	---	---	0.5	NAAQS
	24 hour (1)	0.038	100	0.04	CAAQS
	Annual	0.002	5	0.03	NAAQS

Notes:

1. Staff-Recommended Background data matches that presented in AFC p. 5.2-3 (Calpine 2001a), except for NO_2 (1-hr) and SO_2 (1-hr, 24-hr) where staff identified higher background conditions than the applicant.

Sources: CARB Air Quality Data CD, 2000, and CARB web site, http://www.arb.ca.gov/adam/, Accessed May 2002.

PROJECT DESCRIPTION AND EMISSIONS

The IEEC project would develop a 46-acre site in unincorporated Riverside County near Romoland for power production. The proposed power plant would use two stationary, natural gas-fired combustion turbines with heat recovery steam generators operating in combined cycle mode to provide a nominal output of 670 MW.

CONSTRUCTION ACTIVITIES

Construction of the IEEC will require development of approximately 35 acres of the 46-acre site. The construction activities would include site mobilization (creation of temporary roads, laydown, and work areas), all ground disturbing activities (grading, topsoil storage, installation of underground utilities both on- and off-site), construction and fabrication of the power plant (including major and ancillary equipment, delivery of equipment by rail and truck, transportation of workers, etc.), and commissioning tasks prior to routine operation of the plant. The proposed project construction schedule for IEEC will extend over approximately 25 months, based on a 12-hour daily work schedule. During startup, when some activities will need to occur on a 24-hour basis, some construction activities may occur at any hour. The duration of the construction activities for the IEEC following improvements and ancillary facilities is as follows (AFC Section 3.7 p. 3-48 to 53, Calpine 2001a; and Response to DR #31, IEEC 2002f):

- 35-acre power plant: 25 months.
- Two construction laydown areas totaling 22 acres: temporary 25 months.
- 4.7 mile wastewater pipeline: 2 to 3 months.
- 0.9 mile transmission line interconnect: 1 month.
- 0.9 mile Menifee Road natural gas supply pipeline: 4 to 6 months.
- Menifee Road gas compressor station: 10 months.

During the construction period, air emissions will be generated from the exhaust of the heavy equipment such as bulldozers, excavators, lifts, compressors, paving equipment, and from fugitive dust generated from activities such as clearing, grading, and preparation of the site. **AIR QUALITY Table 5** summarizes the different levels of criteria pollutants that will be generated from the construction activities at the site and along the linear facilities.

AIR QUALITY Table 5
IEEC, Estimated Construction Emissions (Maximum Daily and Annual)

Emissions Rate	NO_x	CO	PM_{10}	SO_2	VOC	Fugitive PM_{10}
Facility Construction Month 5 (lb/day)	116.6	30.2	6.4	3.3	8.4	39.8
Travel and Deliveries for Construction Month 5 (lb/day)	74.9	107.3	4.0	2.9	11.3	---
Facility Construction Month 15 (lb/day)	129.7	35.4	7.8	3.6	10.0	9.8
Travel and Deliveries for Construction Month 15 (lb/day)	414.0	1641.2	16.1	13.9	141.6	---
Total Facility Construction including Travel and Deliveries (ton/year)	26.0	99.3	4.6	0.7	8.8	4.6
Off-Site Linear Facilities						
Natural Gas Pipeline (lb/day)	74.4	29.5	3.8	2.7	5.8	4.7
Wastewater Pipeline (lb/day)	89.8	40.0	4.8	3.4	7.4	5.5
Transmission Line (lb/day)	122.5	44.6	6.1	4.1	9.0	1.1
Gas Compressor Station Construction Months 2-3 (lb/day)	87.4	363.6	4.1	2.1	31.8	17.1
Total Compressor Station including Travel and Deliveries (ton/year)	4.9	26.6	0.2	0.1	2.3	0.9

Source: AFC Appendix K-2, Tables K.2-1 through K.2-4 (Calpine 2001a); Response to DR #31 (IEEC 2002f).

The equipment emissions provided above were based on equipment meeting the U.S. EPA emission standards for off-road diesel equipment and emission factors published in AP-42 (U.S. EPA 2000) and the estimated number of operational hours for each piece of equipment throughout project construction (AFC Appendix K-2, Calpine 2001a). The emission estimates provided above include emission reductions from application of emission reduction strategies proposed by the applicant. Equipment emissions would be reduced by limiting engine idling, shutting down equipment when not in use,

conducting regular preventative maintenance to avoid engine problems, using low sulfur and low aromatic fuel, and using low-emitting diesel engines where available. The emission estimates for SO_2 are based on the use of low sulfur diesel fuel (under 500 ppmw, or 0.05 percent sulfur content) specified by ARB. The fugitive PM_{10} emissions would be reduced by sweeping paved road surfaces, covering material in haul trucks and piles, limiting travel speeds on unpaved surfaces to 25 mph, replanting vegetation in disturbed areas as quickly as possible, and applying water or dust suppressant to disturbed areas. These measures would be implemented by the applicant as proposed (AFC Appendix K-2, p. K.2-2 to 4, Calpine 2001a).

OPERATIONAL PHASE

Equipment Description

The major equipment and facilities proposed in the application includes the following:

- Two GE Model 7251FB combustion turbine generators (CTG) system rated each at 180 MW (nominal); and two HRSGs equipped with duct burners rated at 697 MMBtu/hr (HHV). Each CTG and duct burner will fire exclusively natural gas, and each CTG will include dry low-NOx combustors for NOx reduction. To further reduce gas turbine and duct burner NOx, selective catalytic reduction (SCR) control systems will be provided. The dry low-NOx combustors in the combustion turbines also minimize formation of CO and VOC. To further reduce CO and VOC emissions, oxidation catalysts will be provided in the HRSGs.
- A condensing steam turbine generator system capable of producing approximately 204 MW when the CTGs operate at base load at average ambient conditions. With duct firing and steam injection, peak plant output is approximately 670 MW.
- A 370 hp output diesel-fueled fire water pump engine.
- 1,000 KW natural gas-fired emergency generator.
- 129 MMBtu/hr natural gas-fired auxiliary boiler capable of providing up to 100,000 lb/hr of saturated steam at 400 psig.
- 14-cell mechanical-draft evaporative cooling tower with maximum drift limited to 0.0005 percent of the circulating water flow.
- A continuous emission monitoring (CEM) system for NOx, CO, and oxygen.
- A new 0.9 miles, 20-inch natural gas supply pipeline to the existing Sempra Energy gas transmission line that runs along Menifee Road, about one mile east of the project site.
- An electric-powered gas compressor station at Menifee Road to maintain the required pipeline pressure south of the IEEC.
- A 4.7-mile long wastewater pipeline connection to an existing non-reclaimable wastewater pipeline that presently terminates southwest of IEEC.
- A connection to an existing recycled and raw water pipeline in McLaughlin Road, less than 0.1 mile south of the project site. A new electric-powered recycled water pump station would be included at the Moreno Valley Regional Water Reclamation

Facility, and a new raw water pump station would be included at the location of the future Perris Water Treatment Plant.

- Transmission line interconnect, approximately 0.9 miles in length.

Equipment Operation

The IEEC would have an anticipated annual availability of 92 to 98 percent. However, actual operations will depend on market prices for electricity, ancillary services, and natural gas. The design of the power plant provides operating flexibility that would allow the plant to adapt to changing market conditions (AFC Section 3.4.2, p. 3-10, Calpine 2001a). The applicant's emission calculations conservatively assume 100 percent availability of the CTGs and operation of each duct burner 5,100 hours per year (AFC p. 5.2-30, Calpine 2001a).

Emission Controls

The exclusive use of pipeline-quality natural gas, a relatively clean-burning fuel, will limit the formation of VOC, PM_{10}, and SO_2 emissions. Natural gas contains very little noncombustible gas or solid residues and a small amount of reduced sulfur compounds including mercaptan, thus resulting in relatively low emissions of the above-mentioned pollutants. The applicant anticipates that the natural gas supply will have less than 0.25 grains of sulfur per 100 scf (AFC p. 3-19, Calpine 2001a).

Each combustion turbine generator (CTG) will employ inlet air foggers for increased efficiency on hot days and dry low-NOx combustors. Within the HRSGs, post-combustion emission control will be provided by an SCR system in conjunction with an oxidation catalyst. Simultaneous use of these control technologies will reduce stack exhaust concentrations of NOx to 2.0 ppmvd (@ 15% O_2) on an annual average basis and 2.5 ppmvd on a 1-hour basis, and CO concentrations will be reduced to 6.0 ppmvd (@ 15% O_2) (AFC Section 3.4.12 p. 3-34 to 38, Calpine 2001a). Continuous emission monitors (CEMs) would be installed on the exhaust stack for NOx, CO and oxygen to assure adherence with the proposed CTG emission limits. The CEM system will generate reports of emissions data in accordance with permit requirements and will send alarm signals to the plant's control room when the level of emissions approaches or exceeds pre-selected limits (AFC Section 3.4.12.4 p.3-38, Calpine 2001a).

The counter-flow mechanical draft cooling tower will be equipped with a high efficiency drift eliminator to control PM_{10} emissions. The drift eliminator will control the drift fraction to 0.0005% of the circulating water flow.

The diesel-powered fire pump engine and the natural gas-powered emergency generator engine will each be of a low-emitting design (AFC Appendix K-7, p. K.7-6, Calpine 2001a; and Response to DR #10, FWEC 2002c). The diesel fire pump engine emission rates, as shown by the applicant, will be approximately 5.9 g/bhp-hr for NOx, 3.6 g/bhp-hr for CO, 0.25 g/bhp-hr for PM_{10}, and 1.0 g/bhp-hr for VOC. The natural-gas fired emergency generator engine emission rates, will be approximately 1.5 g/bhp-hr for NOx, 2.0 g/bhp-hr for CO, and 1.5 g/bhp-hr for VOC (AFC Section 5.2.3.2.5 p. 5.2-55 to 56, Calpine 2001a).

The auxiliary boiler will be equipped with a low-NOx combustor and with post-combustion control including an SCR system and CO oxidation catalyst. Used in conjunction with each other, these technologies will provide stack exhaust concentrations of less than 9 ppm of NOx and 50 ppm of CO (@ 3% O_2).

Project Operating Emissions

Air emissions will be generated from operating the major project components. **AIR QUALITY Tables 6 and 7** summarize the maximum (reasonable worst-case) estimated levels of the different criteria pollutants associated with project operation. The assumptions used in calculating the air emissions in the tables include:

- manufacturer guaranteed emission factors,
- the facility potentially operating 24 hours per day (8,760 hours per year), with actual anticipated availability between 92 and 98 percent,
- power plant maximum daily emissions based on each of the two combustion turbines operating at 100% load with duct burners for 16 hours, at 100% load without duct burners for 4 hours, and with 4 hours of a cold startup and hot startup,
- power plant maximum annual emissions based on each of the two combustion turbines operating at 100% load with duct burners for 5,100 hours annually, at 100% load without duct burners for 3,260 hours annually, and with roughly 50 cold starts (150 hours), 100 hot starts (100 hours), and associated shutdowns (150 hours),
- auxiliary boiler operation of 8 hours per day or 3,000 hours annually,
- emergency fire water pump engine operation of 50 hours annually,
- emergency standby generator engine operation of 1 hour per day, 200 hours per year,
- the cooling tower system operating concurrently with the combustion turbine unit operations (i.e. 24 hours per day, 8,760 hours annually),
- a peak vehicle traffic rate of approximately four truck deliveries per day for operating materials plus worker traffic resulting in insignificant mobile source emissions and minor emissions from travel on paved or unpaved road surfaces (Calpine 2001e),
- the Menifee Road gas compressor station will be equipped with electric motor-driven compressors and will not include any combustion or particulate sources (Response to DR #32, FWEC 2002c) and storage of low-vapor-pressure liquids or compressor lubricating oil will result in very low levels of emissions of organic compounds (Sierra 2002).

The proposed project's hourly emission of criteria air pollutants are shown in **AIR QUALITY Table 6**. This table presents the emission rates for each combustion turbine, the cooling tower, the auxiliary boiler, and the emergency engines. For cold startup events, which occur during the first 3 hours of CTG and HRSG operation, the hourly average emission rate during the three-hour event is presented. Hot startup and shutdown events are anticipated to require approximately 60 minutes apiece. Those average hourly emission rates are also shown. As **AIR QUALITY Table 6** shows, the

highest emissions are from each combustion turbine during startup, when NOx and CO emissions are significantly higher than they would be for full-load operation. **Tables 6 and 7** do not show direct $PM_{2.5}$ emissions because no established methodology exists for quantifying these emissions from the proposed sources. Although it is known that a substantial portion of the particulate matter formed during combustion of natural gas likely qualifies within the $PM_{2.5}$ subset of PM_{10}, more specific estimates of the $PM_{2.5}$ emission rates are not available.

AIR QUALITY Table 6
IEEC, Hourly Emissions (pounds per hour, lb/hr)

Operational Profile		NO_x	CO	PM_{10}	SO_x	VOC
CTG Cold Startup (240 minute duration)	lb/hr/CT	80.0	902.0	16.0	1.8	16.0
CTG Hot Startup (60 minute duration)	lb/hr/CT	80.0	838.0	16.0	1.8	16.0
CTG Shutdown (60 minute duration)	lb/hr/CT	80.0	902.0	16.0	1.8	16.0
CTG Average Annually (w/ duct burning)	lb/hr/CT	18.2	33.2	16.0	1.8	6.3
CTG Average Annually (w/o duct burning)	lb/hr/CT	12.9	23.5	11.0	1.3	2.4
CTG Hourly Maximum (w/ duct burning)	lb/hr/CT	22.7	33.2	16.0	1.8	6.3
CTG Hourly Maximum (w/o duct burning)	lb/hr/CT	16.1	23.5	11.0	1.3	2.4
Each Cell of Cooling Tower (14 cells)		--	--	0.24	--	--
Auxiliary Boiler		1.4	4.9	2.7	0.1	0.6
Diesel-Powered Fire Pump Engine		4.4	2.6	0.2	0.1	0.7
Natural Gas-Fired Standby Generator Engine		4.9	6.5	0.5	0.0	4.9
Reasonable Worst-Case Hour: 1 CTG (Cold Startup) + 1 CTG (Maximum) + Auxiliary Boiler + Standby Generator Test		109.0	946.6	38.5	3.7	27.8

Sources: AFC Table 5.2-18, p. 5.2-29, Appendix K-3, Table K.3-1 (Calpine 2001a); and Response to DR #26 (FWEC 2002c).

AIR QUALITY Table 7 summarizes the maximum (reasonable worst case) daily and annual estimated criteria pollutants emissions from the project, using the assumptions listed above. Annual emissions are estimated based on each combustion turbine operating at 100% load, in all anticipated ambient conditions, including about 150 hot and cold startups during the year. Daily and annual emissions for the auxiliary boiler, fire water pump engine, and standby generator engine assume that these units will not be operated full time and that their typical daily and annual schedules of operation will follow the assumptions listed above.

AIR QUALITY Table 7
IEEC, Estimated Maximum Emissions during Operation

Pollutant	NO_x	CO	PM_{10}	SO_x	VOC
Maximum Daily Emissions (lb/day)	1,511	8,385	829	82	360
Maximum Annual Emissions (ton/year)	169.4	598.9	142.3	14.0	48.1

Source: AFC Table 5.2-21, p. 5.2-31 (Calpine 2001a).
Notes: ·

1. Daily emissions based on each of the two combustion turbines operating at 100% load with duct burners for 16 hours, at 100% load without duct burners for 4 hours, and with 4 hours of a cold startup and hot startup, with full time operation of the cooling tower, limited operation of the auxiliary boiler, and standby generator testing.
2. Annual emissions based on each of the two combustion turbines operating at 100% load with duct burners for 5,100 hours annually, at 100% load without duct burners for 3,260 hours annually, and with roughly 50 cold starts (150 hours), 100 hot starts (100 hours), and associated shutdowns (150 hours), with full time operation of the cooling tower, limited operation of the auxiliary boiler, and standby generator and fire pump engine testing.

Ammonia Emissions

Due to the large combustion turbines used in this project and the need to control NOx emissions, significant amounts of ammonia will be injected into the flue gas stream as part of the SCR system. Not all of this ammonia will mix with the flue gases to reduce NOx; a portion of the ammonia will pass through the SCR and will be emitted unaltered, out the stacks. These ammonia emissions are known as ammonia slip. The applicant proposed an ammonia slip no greater than 10 ppm (AFC p. 5.2-56, Calpine 2001a). Achieving 10 ppm slip is equivalent to approximately 33.7 pounds per hour (lb/hr) of ammonia emitted into the atmosphere per CTG/HRSG (AFC Table K-9-1, Appendix K-9, Calpine 2001a). In actual operation, staff expects the equipment to usually achieve much lower ammonia slip concentrations so that emissions would commonly be between 3 to 5 lb/hr.

INITIAL COMMISSIONING

The initial commissioning of a power plant refers to the time frame between the completion of the construction and the reliable production of electricity for sale on the market. For most power plants operating emission limits usually do not apply during the initial commissioning procedures. Normally, during the initial testing during commissioning the post-combustion control systems (i.e., SCR system and oxidation catalyst) may not be fully installed or operational.

The applicant identified two commissioning scenarios in the AFC that would cause increased emissions. Combustor tuning would occur before SCR and oxidation catalyst installation, and testing under partial load would also occur before control system installation and operation is complete (AFC Section 5.2.3.2.2 p. 5.2-40 to 42, Calpine 2001a). The full commissioning sequence would include a series of tests that would cause increased emissions as each unit is commissioned. After first fire, the sequence of commissioning activities for each turbine would be as follows: 1) full speed, no load tests (approximately 20% of maximum heat input), including synchronization, approximately a 3-day period; 2) partial load tests with combustor tuning, prior to installation of the post-combustion control systems, approximately a 6-day period; 3) full

load tests without operation of the SCR, approximately a 2-day period; 4) full load tests for tuning of SCR, approximately 1 day; and 5) full load tests with full operation of the SCR for final tuning, approximately 12 days for both turbines (Calpine 2001c).

The applicant has estimated that the maximum emissions during commissioning would occur during the partial load tests and the full-load tests, as shown in **AIR QUALITY Table 8**.

AIR QUALITY Table 8
Estimated Commissioning Emissions for IEEC (lb/hr per turbine)

Commissioning Activity	NO_x	CO	PM_{10}	SO_x	VOC
Partial Load Tests	155	385	16	1.8	16
Full-Load Tests, without SCR	163	32	16	1.8	16

Source: Response to DR #16 and #17 (FWEC 2002c).

Note: Emissions of PM_{10}, SOx, and VOC would be equivalent or less than the emissions that would occur during routine startups.

In order to manage commissioning and reduce the potential emissions, the applicant indicates that simultaneous commissioning of the turbines without emission controls would not occur (Response to DR #18, FWEC 2002c). As such, the emissions are shown on a per-turbine basis. Because the PM_{10}, SO_2, and VOC emissions during from commissioning vary as a function of the fuel input, they would be expected to be similar to range of emissions anticipated during normal operation.

PROJECT IMPACTS

MODELING APPROACH

Air dispersion modeling provides a means of predicting the location and magnitude of the air contaminant impacts of a new emissions source at ground level. The models consist of several complex series of mathematical equations, which are repeatedly calculated by a computer for a range of ambient meteorological conditions. Model results are often described as a unit of mass per volume of air, such as micrograms per cubic meter ($\mu g/m^3$). They are an estimate of the concentration of the pollutant emitted by the project that will occur at ground level.

Inputs for the modeling include stack information (exhaust flow rate, temperature, and stack dimensions), specific turbine emission data and meteorological data, such as wind speed, atmospheric conditions, and site elevation. For the location of the IEEC, the SCAQMD requires that meteorological data from Riverside in 1981 be used to characterize the project impacts (AFC Appendix K-4 p. K.4-6 to K.4-11, Calpine 2001a; and Response to DR #15, FWEC 2002c). The Riverside meteorological station is 20 miles (32 km) north-northwest of the project site.

The Romoland School District, an intervening party to this case, has expressed concerns about localized air quality impacts from the early stages of the siting process (RSD 2001a, CEC 2002a). During discovery, the Romoland School District and staff

registered concerns that alternative meteorological data from either Perris or the March Air Force Base (AFB) might more accurately portray the local impacts because this data would be more representative of local conditions, especially local wind directions and speeds (R&T 2002b, AEG 2002a, CEC 2002h). To respond to the interveners' concerns, five years of alternative meteorological data from March AFB (approximately 12 miles (19 km) north-northwest of the project site) were identified and acquired by staff from a third-party vendor (Trinity Consultants) to allow comparison of the results obtained with Riverside data. The data was processed independently by the vendor, without the oversight of the SCAQMD, using U.S. EPA protocol where possible. Because meteorological data from any station other than Riverside would not satisfy SCAQMD requirements for that agency's Determination of Compliance, the impacts using March AFB data are presented not as a substitute for, but in parallel with, the impacts from the SCAQMD-required analysis. The March AFB data shows a higher incidence of prevailing winds to the south-southwest and wintertime (reverse flow) wind directions to the north-northwest. There are also differences in how the March AFB data was processed for low mixing heights. The results of the independent analysis using the alternative meteorological data are presented separately below.

The applicant used a regulatory-guideline model approved by the U.S. EPA (Industrial Source Complex, Short-Term, ISCST3 Version 00101) to estimate the impacts of project-related NOx, PM_{10}, CO and SOx emissions. Where necessary to demonstrate compliance with stringent SCAQMD significance thresholds (e.g. NO_2 and PM_{10} thresholds of Rule 1303), the applicant also used a separate screening model specifically designed for handling elevated terrain (CTSCREEN). Because the ISCST3 model does not consider three-dimensional interaction of plumes and terrain, the CTSCREEN model provides a realistic screening-level assessment of impacts to terrain above the tops of the turbine/HRSG stacks. CTSCREEN derives a worst-case impact using a default set of meteorological conditions that does not rely on the local setting but does allow for the plume to spread around terrain. A description of the modeling analysis for construction activities is provided in AFC Appendix K-2, and the analyses for commissioning and operation are described in AFC Section 5.2.3.2.2 (Calpine 2001a).

The applicant's modeled impacts were added to the available highest ambient background concentrations recommended by staff (see **AIR QUALITY Table 4** above). Staff then compared the results with the ambient air quality standards for each respective air contaminant to determine whether the project's emission impacts would cause a new violation of the ambient air quality standards or contribute to an existing violation.

CONSTRUCTION IMPACTS

The applicant provided staff with a modeling analysis of the impacts caused by emissions from construction activities (AFC Appendix K-2, Calpine 2001a; revised with Response to DR #2 and #3, FWEC 2002c; also Response to DR #31, IEEC 2002f). The applicant's modeling incorporated the mitigation measures the applicant has proposed for the construction of the project. The applicant showed that the construction activities would contribute to existing violations of the PM_{10} standards.

Staff reviewed the applicant's modeling analysis (CD-R with FWEC 2002c) and concluded that it does not adequately characterize PM_{10} and annual average NO_2 impacts because the emission sources were underrepresented in the model. The operating schedule of PM_{10} sources was erroneously set at 6-hours per day instead of 12, and annual emissions of NOx were modeled by the applicant at a rate of one-half the anticipated annual total emission rate because the hourly schedule was curtailed. Staff revised these portions of the analysis correcting for these errors.

The results of the applicant's construction impacts analyses **with staff revisions, above,** are presented in **AIR QUALITY Tables 9 and 10**, for the power plant site and the gas compressor station site, respectively. The modeling analyses included both the fugitive dust and equipment exhaust emissions, which include PM_{10}, NOx, CO, and SO_2. In **AIR QUALITY Tables 9 and 10**, the first and second columns list the air contaminant, i.e., NO_2, PM_{10}, and CO, and the averaging time for each air contaminant analyzed. The third and fourth columns present the project impacts and the highest measured concentration of the criteria air contaminants in the ambient air (background), respectively. The fifth column presents the total impact, i.e., the sum of project emission impact and background measured concentration. The values in bold in the impacts and background columns represent values that equal or exceed the relevant air quality standard. The sixth column presents the most restrictive ambient air quality standard for such air contaminant. The seventh column presents the percentage of the total impacts in relation to the most restrictive ambient air quality standards. **Table 10** shows that the impacts caused by construction of the gas compressor station site would be similar to those from construction of the power plant site.

AIR QUALITY Table 9
IEEC, Construction Impacts at Power Plant Site (in µg/m^3)

Pollutant	Averaging Period	Project Impact	Back-ground	Total Impact	Limiting Standard	Type of Standard	Percent of Standard
PM_{10}	24-hour (b)	110	**139**	**249**	50	CAAQS	**498**
	AGM (b)	12	**44**	**56**	30	CAAQS	**187**
	AAM (b)	12	**50**	**62**	50	NAAQS	**124**
NO_2	1-hour (a)	230	274	**504**	470	CAAQS	**107**
	Annual (b)	22	36	58	100	NAAQS	58
CO	1-hour	299	12,650	12,949	23,000	CAAQS	56
	8-hour	129	6,302	6,431	10,000	NAAQS	64
SO_2	1-hour	31	288	319	650	CAAQS	49
	3-hour	---	---	N/A	1,300	NAAQS	---
	24-hour	5	100	**105**	105	CAAQS	**100**
	Annual	0.4	5	6	80	NAAQS	7

Source: Response to DR #3 (FWEC 2002c).

Notes: Based on Riverside meteorological data as required by SCAQMD.

(a) NO_2 (1-hour) impacts based on applicant's ISC3-OLM analysis, which staff believes to be invalid because of using ozone data from 1999 with 1981 meteorological data. NO_2 (annual) impacts based on Ambient Ratio Method (ARM). See further independent staff analysis below using OLM with alternative meteorological data (1997-2001) for a more refined evaluation of construction impacts.

(b) Independent staff assessment was necessary to correct errors in the applicant's modeled emission rates for PM_{10} and annual average NO_2.

AIR QUALITY Table 10
IEEC, Construction Impacts at Compressor Station Site (in µg/m^3)

Pollutant	Averaging Period	Project Impact	Back-ground	Total Impact	Limiting Standard	Type of Standard	Percent of Standard
PM_{10}	24-hour	**92**	**139**	**231**	50	CAAQS	**462**
	AGM	10	**44**	**54**	30	CAAQS	**180**
	AAM	10	**50**	**60**	50	NAAQS	**120**
NO_2	1-hour (a)	210	274	**484**	470	CAAQS	**103**
	Annual	11	36	47	100	NAAQS	47
CO	1-hour	296	12,650	12,946	23,000	CAAQS	56
	8-hour	118	6,302	6,420	10,000	NAAQS	64
SO_2	1-hour	26	288	314	650	CAAQS	48
	3-hour	---	---	---	1,300	NAAQS	---
	24-hour	5	100	**105**	105	CAAQS	**100**
	Annual	0.5	5	6	80	NAAQS	7

Source: Response to DR #31 (IEEC 2002f).

Notes: Based on Riverside meteorological data as required by SCAQMD.

(a) NO_2 (1-hour) impacts based on applicant's ISC3-OLM analysis using ozone data from 1981 with 1981 meteorological data. NO_2 (annual) impacts based on Ambient Ratio Method (ARM). See further independent staff analysis below using OLM with alternative meteorological data (1997-2001) for a more refined evaluation of construction impacts.

The maximum modeled project construction impacts would occur at the fence line and they decrease notably with distance. Residential or other sensitive receptors do not exist at the fence line, so the maximum modeled PM_{10} concentration at the maximum exposed sensitive receptor will be significantly lower than the concentrations shown above.

A review of the modeling results shows that in the vicinity of the Romoland Elementary School, located approximately 0.34 miles north north-west of the site (AFC Table 5.15-1, Calpine 2001a), the maximum modeled 24-hour PM_{10} concentration caused by construction activities would be approximately 12 µg/m^3, or less than 1/5th of the maximum fence-line concentration shown in **AIR QUALITY Table 9**, and the annual average PM_{10} concentration at the school would be approximately 1/10th the maximum fence line concentration. The 24-hour reasonable worst-case PM_{10} impacts at the school would be less than ten percent of the existing background conditions. Concentrations in these ranges would by themselves not be significant, but are considered significant because of the violations that occur in the existing background conditions.

For both the power plant site and the gas compressor station site, the project construction activities would further exacerbate existing violations of the state 24-hour PM_{10} standard, and thus constitute a significant air quality impact for PM_{10}. Additionally, NOx and VOC emissions from construction equipment would contribute to existing violations of the ozone standards and thus constitute a significant air quality impact for ozone and ozone precursors. The project's construction activities would not create a new violation of CO air quality standards, thus the CO impacts are not considered significant.

This analysis also shows that construction may cause new violations of short-term NO_2 and SO_2 standards. To conservatively estimate project impacts, staff uses the highest background concentration observed during any recent hour or day. High background concentrations of NO_2 and SO_2 have occurred during single days in the previous three years of background data gathered from Lake Elsinore and Riverside, respectively.

The project-plus-background NO_2 concentrations could exceed the hourly CAAQS when the highest hour of background NO_2 (from November 2001) is added with the highest modeled hourly concentration presented by the applicant. Staff considers the highest modeled NO_2 concentration presented by the applicant in Response to DR #3 (FWEC 2002c), and in **AIR QUALITY Tables 9 and 10**, above, to be invalid because the applicant's analysis used the ozone limiting method (OLM) with ozone data from 1999 in conjunction with meteorological data from 1981. Because ambient ozone concentrations are dramatically affected by meteorological conditions (temperature, stability, and sunlight), the meteorology and ambient ozone data used in OLM need to be from the same year. Further independent analysis by staff was prepared using the alternative meteorological data (1997-2001) with concurrent ozone data to refine the applicant's analysis. This is addressed in a separate text section below (see **AIR QUALITY Impacts with Alternative Meteorological Data**).

The maximum daily 24-hour SO_2 concentrations could equal the 24-hour SO_2 CAAQS when project construction impacts are added to the highest recent background concentrations. Because background concentrations of SO_2 observed in Riverside reflect the contributions of emissions from more industrial and mobile source activity, background data from Riverside overestimates the background conditions that occur near the project site. Compared to the high background concentrations at Riverside, the impacts of construction related SO_2 near the project site are small (approximately five percent of the CAAQS). For these reasons, staff believes construction activities would not be likely to cause a new violation of SO_2 CAAQS, but that mitigation is necessary to assure the impact is insignificant.

OPERATION IMPACTS

A refined modeling analysis was performed to identify off-site criteria pollutant impacts from operational emissions of the proposed project. The impact modeling analysis included both maximum operating and startup/shutdown scenarios to determine maximum short-term and annual emission impacts. Short-term impacts from NOx and CO during startups (hourly averaging periods) were recalculated by staff in order to account for simultaneous normal operation of one combustion turbine that could occur while starting the other turbine. The annual emissions modeling are based on the plant operating 8,760 hours per year with startup and shutdown modes accounting for 400 of those hours. The emissions are explained in **AIR QUALITY Tables 6 and 7** above.

The applicant's predicted maximum hourly concentrations of the nonreactive pollutants are summarized in **AIR QUALITY Table 11**.

AIR QUALITY Table 11
IEEC, Impacts from Routine Operations
(in µg/m^3)

Pollutant	Averaging Period	Project Impact	Back-ground	Total Impact	Limiting Standard	Type of Standard	Percent of Standard
PM_{10}	24-hour	9.9	**139**	**149**	50	CAAQS	**298**
	AGM	1.4	**44**	**45**	30	CAAQS	**151**
	AAM	1.4	**50**	**51**	50	NAAQS	**103**
NO_2	1-hour (a,b)	88.4	274	363	470	CAAQS	77
	Annual	0.5	36	37	100	NAAQS	37
CO	1-hour (a,b)	799.9	12,650	13,450	23,000	CAAQS	58
	8-hour	418.7	6,302	6,721	10,000	NAAQS	67
SO_2	1-hour (b)	3.1	288	291	650	CAAQS	44
	3-hour	2.7	---	3	1,300	NAAQS	---
	24-hour	0.9	100	101	105	CAAQS	96
	Annual	0.1	5	5	80	NAAQS	7

Source: Revised Table 5.2-3 and 5.2-26 in Response to DR #20-23 (FWEC 2002c).

Notes: Based on Riverside meteorological data as required by SCAQMD.

(a) Independent staff analysis was necessary for NO_2 and CO (1-hour) to address startup of one turbine with normal, concurrent operation of the other turbine and the boiler, along with occasional testing of the emergency generator, as illustrated in AFC Table 5.2-21.

(b) Hourly NO_2, CO, and SO_2 impacts do not show the effects of occasional emergency generator testing. During times when the emergency generator is being tested, maximum 1-hour impacts would be approximately NO_2: 244.3 µg/m^3, CO: 814.4 µg/m^3, and SO_2: 30.1 µg/m^3. All impacts show the effects of startups as routine operations. In the table above, as in FWEC 2002c, the 1-hour NO_2 impacts are presented without using OLM. See further independent staff analysis below using OLM with alternative meteorological data (1997-2001) for a more refined evaluation of impacts during testing of emergency generator.

The maximum impacts identified with the applicant's use of CTSCREEN occurred in the hills near Romoland, mainly to the south and east, where terrain exists above the turbine/HRSG stack top. Maximum annual NO_2 impacts and maximum PM_{10} impacts from the turbines, both 24-hour and annual average, occurred in the hills roughly 1.5 miles (2 to 3 km) south and slightly east of the project and in the foothills roughly 4 miles (5 to 7 km) east and slightly south of the project (CD-R, FWEC 2002c; and AFC CD-R, Sierra 2001a).

A review of the modeling results shows that in the vicinity of the Romoland Elementary School, the maximum modeled 24-hour PM_{10} concentration caused by project operation would be less than 0.5 µg/m^3, which would be less than 1/10th of the maximum anticipated concentration shown in **AIR QUALITY Table 11**. This means the impacts at the school would be less than one-half of one percent of the existing background conditions.

There would be no substantive sources of emissions associated with operation of the Menifee Road gas compressor station. Minor emissions of organic compounds from storage of low-vapor-pressure liquids would occur and would be precursors to ozone. No analysis of ambient air quality impacts is necessary for these emissions.
Direct impacts of PM_{10} would be significant because they would contribute to existing violations of the standards. Direct impacts of NO_2 would also be potentially significant,

but because the applicant did not use OLM for operational NO_2, an independent analysis was prepared by staff using OLM with concurrent ozone data to refine the applicant's analysis. This is addressed in a separate text section below (see **AIR QUALITY Impacts with Alternative Meteorological Data**). Direct impacts to CO and SO_2 would not be significant because the project would not cause or contribute to a violation of these standards. Secondary, or indirect, impacts caused by emissions of precursors to PM_{10} and ozone are discussed further below. Mitigation is appropriate in order to reduce significant, direct impacts of PM_{10}.

Direct and indirect impacts to $PM_{2.5}$ concentrations are not quantified because no established methodology exists for quantifying direct $PM_{2.5}$ emissions from the proposed sources or characterizing the complex interaction of $PM_{2.5}$ precursors in the ambient air. However, because PM_{10} emissions from the combustion turbines would primarily qualify as emissions of $PM_{2.5}$, the project would be expected to contribute to the elevated levels of ambient $PM_{2.5}$ that exist in the background conditions. To minimize project contributions to existing $PM_{2.5}$ violations, mitigation for this pollutant could be provided by mitigating combustion-related PM_{10}, which includes $PM_{2.5}$, and reactive precursors that can lead to $PM_{2.5}$.

Fumigation Impacts

There is the potential that higher short-term concentrations may occur during fumigation conditions. Fumigation conditions are generally short-term in nature and are only compared to 1-hour standards. The applicant analyzed the air quality impacts for plant emissions occurring under fumigation conditions using the SCREEN3 model (Version 96043) (AFC p. 5.2-39 Appendix K.5 and Table K.5-4). Under fumigation conditions, during either startup or steady operation, the short-term project impacts would not exceed the impacts for routine operation shown in **AIR QUALITY Table 11** above.

Secondary Pollutant Impacts

The project's gaseous emissions of NOx, SO_2, VOC and ammonia are precursor pollutants can contribute to the formation of secondary pollutants, ozone, PM_{10}, and $PM_{2.5}$. The process of gas-to-particulate conversion is complex and depends on many factors, including local humidity and the presence of other compounds. Currently, there are no agency-recommended models or procedures for estimating nitrate or sulfate formation. However, because of the known relationship of NOx and SO_2 emissions to secondary PM_{10} formation, it can be said that the emissions of NOx and SO_2 from the project do have the potential (if left unmitigated) to contribute to higher PM_{10} levels in the region (and possibly $PM_{2.5}$), and NOx and VOC emissions do have the potential to contribute to higher ozone levels.

As identified above, PM_{10} impacts would be significant due to direct impacts. Significant indirect impacts would also occur for PM_{10} and ozone because routine operational emissions of precursor pollutants would contribute to existing violations of the PM_{10} and ozone standards. Along with mitigation that is appropriate to reduce significant, direct impacts of PM_{10}, additional mitigation for emissions of NOx, SO_2, and VOC is appropriate to reduce indirect impacts to PM_{10} and ozone.

Initial Commissioning Impacts

Emissions caused by the commissioning activities were analyzed for their impacts to ambient air quality. Commissioning tests of the combustion turbines at partial loads or without the emission control systems in place would cause emissions of NOx or CO that could exceed those anticipated for routine startups. Because commissioning activities would occur over periods that would not be continuous, averaging periods longer than 1-hour do not need to be considered. To minimize emissions and potential impacts, the applicant would limit commissioning tests having uncontrolled emissions to one turbine at a time (Response to DR #18, FWEC 2002c). The commissioning impacts are summarized in **AIR QUALITY Table 12**.

AIR QUALITY Table 12
IEEC, Commissioning Impacts (in µg/m^3)

Pollutant	Averaging Period	Project Impact	Back-ground	Total Impact	Limiting Standard	Type of Standard	Percent of Standard
NO_2	1-hour	161	274	435	470	CAAQS	93
CO	1-hour	389	12,650	13,039	23,000	CAAQS	57

Source: Response to DR #16 and #17 (FWEC 2002c).

Note: Based on Riverside meteorological data as required by SCAQMD. Impacts of PM_{10}, SOx, and VOC would be similar or less than the impacts that would occur during routine startups.

Although this analysis finds no significant impact to occur during commissioning, there are incentives for the applicant to minimize emissions. During commissioning, all criteria air contaminant emissions will be counted toward the annual emission limits; thus there is an incentive for the applicant to limit the commissioning period to the shortest time possible.

VISIBILITY IMPACTS

A visibility analysis of the project's gaseous emissions is required in SCAQMD Rule 1303 for major sources. The IEEC project is subject to visibility requirements because of proposed NOx and PM_{10} emissions (AFC p. 5.2-69, Calpine 2001a). In response to these requirements, the applicant prepared a visibility analysis for the nearest Class I areas. The Class I areas near IEEC are managed by either the US Forest Service (USFS) or the National Park Service (NPS). The nearest Class I areas and the associated Federal Land Managers and distances, are as follows:

- Agua Tibia Wilderness Area, USFS, 21 miles (34 km)
- San Jacinto Wilderness Area, USFS, 27 miles (43 km)
- San Gorgonio Wilderness Area USFS, 29 miles (46 km)
- Cucamonga Wilderness Area, USFS, 40 miles (65 km)
- Joshua Tree National Park, NPS, 44 miles (71 km)
- San Gabriel Wilderness Area, USFS, 53 miles (86 km)

The visibility analysis includes two components: (1) a regional haze analysis to determine the change in light extinction in the Class I areas, and (2) a coherent visible

plume impact analysis. The Federal Land Managers were provided opportunity to comment on the analysis with the SCAQMD transmittal of the analysis in March 2002 (SCAQMD 2002b).

The regional haze analysis used the CALPUFF model for distant Class I areas (greater than 50 km, or 31 miles), Joshua Tree National Park and the Cucamonga and San Gabriel Wilderness Areas. The model estimates ambient concentrations of particulate nitrate, particulate sulfate, and PM_{10} in conjunction with a relative humidity adjustment to change in visibility caused by project emissions of NOx, SO_2, and PM_{10}. The analysis found that the project would cause less than a 5 percent change in light extinction when compared to background conditions for these three Class I areas (AFC p. 5.2-50).

The coherent visible plume impact analysis used the U.S. EPA VISCREEN Level II screening methodology. With this approach, project emissions were shown to pass the visibility screening criteria at the three nearest Class I areas, the Agua Tibia, San Jacinto, and San Gorgonio Wilderness Areas (AFC Appendix K.6). Because the analyses showed that the accepted criteria would not be exceeded, the project's visibility impacts on Class I areas are considered insignificant.

IMPACTS WITH ALTERNATIVE METEOROLOGICAL DATA

An alternative impact assessment is presented here using the meteorological data obtained from the March AFB location. Because the methods used to process the March AFB data were not reviewed by the SCAQMD, the applicant was not required to conduct an analysis with this alternative meteorological data. For construction and operation of the project including commissioning, the highest concentrations using the Riverside data are compared with the impacts obtained using five years (1997-2001) of March AFB data. In the comparison, the exact locations and magnitudes of maximum impacts were expected to change slightly because of the differences in the data; background concentrations do not change in this analysis. Because the applicant and staff analyses using Riverside data show that project impacts of CO and SO_2 would be far below the existing ambient background conditions and more than likely to comply with applicable standards, staff focused the analysis using alternative data to investigate the impacts of PM_{10} and NO_2.

Construction Impacts with March AFB Data

AIR QUALITY Table 13 provides a comparison of project impacts during construction using the Riverside data required by the SCAQMD versus the staff-obtained March AFB data. The alternative data generally shows that short-term PM_{10} impacts would be slightly higher (less than ten percent) than anticipated by the applicant. This difference can be attributed to differences in the methods used to process the meteorological data prior to running the model and does not represent a notable change in anticipated impacts. Staff used a more-refined OLM analysis for NO_2 impacts with contemporaneous background data to demonstrate that no violation of the NO_2 standards would occur, where the applicant did not use OLM.

AIR QUALITY Table 13
IEEC, Construction Impacts at Power Plant Site
using Staff's Alternative Meteorological Data (in µg/m^3)

Pollutant	Averaging Period	Staff/ March AFB Impact	Back-ground	Staff Total Impact	Limiting Standard	Type of Standard	Staff Percent of Standard
PM_{10}	24-hour	**121**	**139**	**260**	50	CAAQS	**520**
	AGM	10	**44**	**54**	30	CAAQS	**180**
	AAM	10	**50**	**60**	50	NAAQS	**120**
NO_2	1-hour (a)	312	128 (a)	439	470	CAAQS	93
	Annual	14	36	50	100	NAAQS	50

Source: Independent staff assessment.

Notes: Alternative to applicant's results using Riverside meteorological data as required by SCAQMD with results obtained using five years (1997-2001) of alternative meteorological data from March AFB.

(a) Hourly NO_2 maximum concentration calculated by staff using OLM and worst-case background NO_2 data from Lake Elsinore monitoring station for the actual month of the modeled maximum. No violations were found to occur for the five-year period.

At the Romoland Elementary School, short-term impacts predicted using the alternative meteorological data were found to be higher than those predicted using the Riverside data. This may be due to the alternative meteorological data having a higher incidence of wintertime (reverse flow) wind directions in the general direction of the school to the north-northwest or due to differences in how the alternative data was processed, when compared to the SCAQMD-approved Riverside data. At the school, the maximum modeled 24-hour PM_{10} concentration caused by construction activities using March AFB data would be approximately 16 µg/m^3, this would be higher than the 12 µg/m^3 anticipated by the applicant's analysis, but would still be less than 1/5th of the maximum fence-line concentration. As with the applicant's analysis, the annual average PM_{10} concentration at the school using March AFB data would be approximately 1/10th the maximum fence line concentration. As with the impacts found using the Riverside data, PM_{10} concentrations at the school would not by themselves be considered a significant impact, but are considered significant because of the violations that occur in the existing background conditions.

Operation Impacts with March AFB Data

AIR QUALITY Table 14 provides a comparison of project impacts during routine operations using the Riverside data required by the SCAQMD versus the staff-obtained March AFB data. As with the construction impacts, the alternative data shows that short-term PM_{10} impacts would be slightly higher (less than ten percent) than anticipated by the applicant, but the differences do not represent a notable change in anticipated impacts. Staff used a refined OLM analysis for NO_2 impacts to demonstrate that no violation of the NO_2 standards would occur, where the applicant did not rely on OLM.

AIR QUALITY Table 14
IEEC, Impacts from Routine Operations
using Staff's Alternative Meteorological Data (in µg/m^3)

Pollutant	Averaging Period	Staff/ March AFB Impact	Back-ground	Staff Total Impact	Limiting Standard	Type of Standard	Staff Percent of Standard
PM_{10}	24-hour	15.2	**139**	**154**	50	CAAQS	**308**
	AGM	1.2	**44**	**45**	30	CAAQS	**151**
	AAM	1.2	**50**	**51**	50	NAAQS	**102**
NO_2	1-hour (a)	178	274 (a)	452	470	CAAQS	96
	Annual (b)	n/a	36	n/a	100	NAAQS	n/a

Source: Independent staff assessment.

Notes: Comparison of applicant's results using Riverside meteorological data as required by SCAQMD with results obtained using worst of five years (1997-2001) of alternative meteorological data from March AFB. These impacts reflect the times when the emergency generator is being tested.

(a) Hourly NO_2 maximum concentration calculated by staff using OLM and worst-case background NO_2 data from Lake Elsinore monitoring station for each of the five years. No violations were found to occur for the five-year period.

(b) Annual NO_2 concentrations not recalculated with alternative meteorological data because applicant's analysis using CTSCREEN already assumes worst-case meteorological conditions and would not be influenced by alternative data.

In the vicinity of the Romoland Elementary School, the maximum modeled PM_{10} concentrations caused by project operation would not change substantially with the March AFB data when compared to the applicant's analysis. The maximum 24-hour PM_{10} concentrations would continue to be less than 0.5 µg/m^3, which would be less than 1/20th of the maximum concentration. This means the impacts at the school would be less than one-half of one percent of the existing background conditions.

Commissioning Impacts with March AFB Data

An independent staff assessment of project impacts during commissioning using the worst of five years (1997-2001) of alternative meteorological data from March AFB revealed that maximum NO_2 and CO impacts during commissioning would not exceed those identified by the applicant's analysis (Response to DR #16 and #17, FWEC 2002c). This means that the impacts obtained by staff with the March AFB data were less than those previously characterized by the applicant and shown above in **AIR QUALITY Table 12**, and no further analysis is necessary.

MITIGATION

Applicant's Proposed Mitigation

Construction Mitigation

SCAQMD Rule 403 requires the applicant to limit fugitive dust during the construction phase of a project. To comply with this rule and reduce construction impacts, the applicant proposed a variety of mitigation measures for fugitive dust and equipment exhaust emissions (AFC Appendix K.2-2 to K.2-3, Calpine 2001a). The applicant's

measures include dust suppression for unpaved travel surfaces and parking areas, covering haul trucks, limiting traffic speeds, replanting vegetation in disturbed areas and minimizing wind erosion with dust suppressant or wind breaks. Also the emissions from equipment would be minimized by limiting the idling time of equipment, conducting preventative maintenance, using low sulfur (500 ppmw, or 0.05 percent, sulfur content) and low aromatic diesel fuel that meets state standards for motor vehicles, and using low-emitting diesel engines if available. The applicant's PM_{10} emission estimates and modeling assume implementation of the fugitive dust emission control measures.

Operations Mitigation

The project proposal includes a combination of clean-fuel-firing equipment, emission control devices, and emission reduction credits. The equipment description, equipment operation, and emission control devices are provided in the **AIR QUALITY Project Description**.

Combustion Turbine

The natural gas combustion turbines would limit NOx formed during combustion using dry low-NOx combustors. Compared to steam or water-injection designs, combustors designed for low-NOx firing maintain low temperatures, thus minimizing NOx formation, while thermal efficiencies remain high.

Flue Gas Controls

To further reduce the emissions from the combustion turbines before they are exhausted into the atmosphere, flue gas controls, primarily catalyst systems, will be installed in the HRSG. The applicant is proposing two catalyst systems: a selective catalytic reduction system to reduce NOx, and an oxidizing system to reduce CO and VOC.

Cooling Tower

The proposed cooling system would use drift eliminators to minimize cooling tower drift and the accompanying PM_{10} emissions.

Emission Offsets

In addition to emission control strategies included in the project design, SCAQMD Regulation XIII requires the applicant to offset emissions of PM_{10}, CO, SO_2, and ozone precursor pollutants (NOx and VOC/ROG). The applicant plans to offset NOx emissions with RECLAIM trading credits (RTCs) that would be exchanged as allowed in Rule 2005. For Non-RECLAIM pollutants the offsets would be in the form of emission reduction credits (ERCs) or credits from the Priority Reserve program of Rule 1309.1. The applicant proposes to mitigate IEEC impacts through compliance with these programs (AFC p. 5.2-59, Calpine 2001a).

The SCAQMD, as the administrator of these programs, evaluated the status of IEEC's participation in the offset programs in the Preliminary Determination of Compliance (SCAQMD 2002x). According to the PDOC and non-confidential filings made by the applicant with the CEC (Calpine 2002a), sufficient ERCs/RTCs have not yet been presented by the applicant, and the project emissions would not be fully offset without

participation in the Priority Reserve program. **AIR QUALITY Table 15** shows the offset liabilities defined by the SCAQMD.

AIR QUALITY Table 15
IEEC, Offset Liability and Proposed Offset Strategy

Pollutant	Offset Liability	Proposed Offset Strategy	Offset Ratio	RTC/ERC Required
NO_x, lb/yr (a)	3,478,055	RTCs	1.0	3,478,055
CO, lb/day (b)	795	ERCs	1.2	954
PM_{10}, lb/day (b,c)	733	ERC or Priority Reserve	1.2 or 1.0	880 or 733
SO_x, lb/day (b)	82	Priority Reserve	1.0	82
VOC, lb/day (b)	299	ERCs	1.2	359

Source: PDOC, p. 31, p. 38. SCAQMD 2002x.

Notes:

a. NO_x RTC requirement is calculated for the first year of operation assuming the following: 876 hours of commissioning and anticipated first-year operations. First year NOx RTC requirement does not yet reflect emission control systems that would be installed and later certified at IEEC.

b. Non-RECLAIM pollutant requirements are calculated based on a 30-day average calculation. ERCs are discounted at a ratio of 1.2:1.0.

c. PM_{10} emissions shown above do not include the emissions from the cooling tower, which do not need to be offset per District rules, but will need to be offset to satisfy CEQA requirements.

NOx Emission Offsets

The applicant has acquired the following NOx RTCs:

- 140,000 lb/yr from Coastal Zone, Cycle 1, for years 2003-2010+
- 147,000 lb/yr from Coastal Zone, Cycle 1, for years 2003-2010+
- 55,034 lb/yr from Coastal Zone, Cycle 2, for years 2003-2010+

These RTCs (340,034 lb/yr total) would offset approximately 10% of the first year NOx RTC requirement. The applicant has not provided a strategy to satisfy the remaining NOx requirement.

CO Emission Offsets

The applicant has proposed to surrender the following CO ERCs:

- 677 lb/day from #AQ003178, Calpine Corporation, Los Angeles
- 144 lb/day from #AQ004233, Inland Valley Development Agency, Riverside
- 3 lb/day from #AQ004222, San Bernardino International Airport Authority, San Bernardino

The ERCs would be discounted at a ratio of 1.2:1.0, which provides an equivalent offset of 687 lb/day. The applicant's proposal would offset approximately 86% of the CO liability (687 of 795 lb/day). The applicant has proposed purchasing additional ERCs to satisfy the remainder of the CO liability (Calpine 2002a).

PM_{10} Emission Offsets

The applicant has proposed to generate PM_{10} ERCs with a road-paving program at undisclosed locations in Riverside County. However, no PM_{10} ERCs have yet been identified for IEEC (SCAQMD 2002x). The lack of a PM_{10} offset or emission reduction strategy was identified as an issue at the origin of the IEEC siting case (CEC 2002a) because of the scarcity of PM_{10} credits. If ERCs are found by the applicant to be unavailable, the applicant has proposed to purchase the required PM_{10} credits (733 lb/day) from the SCAQMD Priority Reserve program (Calpine 2002a). Credits from the Priority Reserve program would be allowed only for those sources subject to permitting by SCAQMD. This means that program credits could not be used for the cooling tower at IEEC, which is exempt from SCAQMD permitting. As one of the requirements of the Priority Reserve program, sufficient non-refundable funds would need to be deposited to the SCAQMD ($25,000 per PM_{10} lb/day, or $18.33 million) to purchase Priority Reserve PM_{10} credits prior to the SCAQMD issuing the Permit to Construct/Title V permit.

SOx Emission Offsets

The applicant has not identified any SOx ERCs for IEEC. The applicant has proposed to purchase the required SOx credits (82 lb/day) from the Priority Reserve program (Calpine 2002a). As one of the requirements of the Priority Reserve program, non-refundable funds ($8,900 per SOx lb/day, or $0.73 million) required for Priority Reserve SOx credits would need to be deposited to the SCAQMD.

VOC Emission Offsets

The applicant has proposed to surrender the following VOC ERCs:

- 1,473 lb/day from #AQ003069, Calpine Corporation, Los Angeles

The ERCs would be discounted at a ratio of 1.2:1.0, which provides an equivalent offset of 1,228 lb/day. The applicant's proposal would fully offset the VOC liability.

ADEQUACY OF PROPOSED MITIGATION

Construction Mitigation

The effectiveness of the proposed construction mitigation can be expressed by the percentage of uncontrolled emissions that are avoided, and it varies widely due to the number of influencing factors. Some of these factors include: ambient conditions (temperature, wind & humidity), size and weight of vehicles, vehicle speed, frequency and number of active vehicles, soil characteristics (chemical composition, particle size distribution, organic components), and day-to-day aggressiveness of mitigation efforts (e.g., application of water or dust suppressants, street sweeping to remove carryout from paved roads). If the mitigation measures for fugitive dust-generating activities are applied correctly and with sufficient frequency, the control efficiency can approach 100%. Much of the uncertainty is due to varying degrees of vigilance on the part of construction personnel. The applicant presents a reasonable worst-case analysis of probable impacts and thus presumes an average fugitive dust mitigation efficiency. The effectiveness of proposed mitigation for construction equipment emissions also depends largely on the vigilance of construction personnel to operate equipment properly.

Direct PM_{10} impacts during construction would be reduced by the proposed mitigation but would remain significant because any increase in PM_{10} concentrations could contribute to continuing violations of the PM_{10} standards. With the proposed mitigation, the modeling analysis shows direct 24-hour PM_{10} impacts in the vicinity of the Romoland Elementary School to be approximately 16 $\mu g/m^3$, a level that would exacerbate the existing violations. Similarly, indirect impacts for PM_{10} and ozone would continue to be significant because construction emissions of PM_{10} and ozone precursors could contribute to increases in PM_{10} and ozone concentrations. Additional mitigation is appropriate to reduce potentially significant SO_2 impacts and the direct and indirect PM_{10} and ozone impacts.

Operations Mitigation

Combustion Turbine/Flue Gas Controls

CEC staff is concerned that the SCAQMD BACT determination in the PDOC for gas turbine emissions of NOx and CO may be inconsistent with current U.S. EPA recommendations. As illustrated in the **Project Description**, the proposed emissions with these controls in place would be 2.5 ppm NOx on a 1-hour basis, 2.0 ppm NOx annually, 6.0 ppm CO, and 2.0 ppm VOC at an ammonia slip level of 10 ppm. Recommendations from U.S. EPA on recent CEC cases indicate that 2.0 ppm may actually be achievable for NOx and CO on a 1-hour basis. The PDOC does require the project to achieve a more-stringent ammonia slip level of 5 ppm but does not require the more stringent levels for NOx and CO. (The PDOC would notably require NOx and PM_{10} levels for the auxiliary boiler below those proposed by the applicant.) The PDOC would need to be changed if the SCAQMD takes the position that the more-stringent NOx and CO levels are indeed achievable and demonstrated in practice. As such, additional control may ultimately be necessary to satisfy LORS, but the need for additional control cannot be determined until the Final Determination of Compliance is released.

Emission Offsets

AIR QUALITY Table 16 shows a comparison of the offset liabilities, acquired offsets, and remaining liability that needs to be mitigated.

AIR QUALITY Table 16
IEEC, Offset Liability and Residual Impact

Pollutant	Offset Liability	CEQA-only Emissions	Acquired Offsets	Offset Ratio (a)	Value of Acquired Offsets	Remaining Liability
NO_x, lb/yr	3,478,055	---	340,034	1.0	340,034	3,138,021
CO, lb/day	795	---	824	1.2	687	108
PM_{10}, lb/day	733	+79 (a)	None	1.2 or 1.0	None	974 or 812
SO_x, lb/day	82	---	None	1.0	None	82
VOC, lb/day	299	---	1,473	1.2	1,228	None

Source: Based on SCAQMD 2002x, with independent staff assessment.

Notes:

a. See **AIR QUALITY Table 15** for the proposed offset strategies and discount ratios.

b. PM_{10} emissions from the cooling tower have no offset liability per District rules, but will need to be mitigated to satisfy CEQA requirements.

The ability of the applicant's offsets strategy to mitigate project impacts depends partially on the completeness of the acquired offsets and partially on the efficacy of the SCAQMD offset program to address all emissions. Because the applicant's offset acquisitions for NOx, CO, PM_{10}, and SOx are incomplete (Calpine 2002a, SCAQMD 2002x), CEC staff considers the operational impacts to be inadequately mitigated. If proper offsets can be acquired, impacts related to NOx, CO, SOx, and combustion-related PM_{10} (including $PM_{2.5}$) would be fully mitigated.

Participation in the Priority Reserve program for PM_{10} will not fully mitigate PM_{10} impacts. The SCAQMD does not require offsets for new emissions from sources that may be exempt from New Source Review regulations (i.e., the proposed cooling tower). As such, the applicant may not be able to access the SCAQMD Priority Reserve program to offset PM_{10} emissions from the cooling tower. Because CEC staff recognizes the cooling tower as a source of PM_{10} that requires mitigation through CEQA, additional PM_{10} mitigation would be necessary to supplement the applicant's proposal. The additional, CEQA-only, liability is equal to approximately 79 lb/day PM_{10}. As such, the impacts from the cooling tower require additional mitigation.

STAFF PROPOSED MITIGATION

Construction Mitigation

Construction emissions of PM_{10}, VOC, and NOx would need to be reduced to avoid PM_{10} and ozone impacts. Much of the uncertainty in the effectiveness of the applicant's proposed strategy for construction mitigation is due to varying degrees of vigilance on the part of construction personnel. Staff's proposed Conditions of Certification (**AQ-C3** through **AQ-C6**) would require the applicant to prepare and adhere to a Fugitive Dust Mitigation Plan, a Diesel Construction Equipment Mitigation Plan, a Gasoline Construction Equipment Mitigation Plan, and an Ambient Air Monitoring program. One aspect of the Diesel Construction Equipment Mitigation Plan would require consideration of ultra-low sulfur diesel fuel, in order to address potentially significant SO_2 impacts. In order to confirm implementation of these plans, staff proposes rigorous monitoring and recordkeeping (**AQ-C2**) of certain environmental parameters that would

be used to indicate whether a high degree of day-to-day vigilance is being maintained. Each of these responsibilities would be coordinated by personnel specifically approved by the Energy Commission to fill the roles of Construction Mitigation Manager and Fugitive Dust Mitigation Manager (**AQ-C1**). A condition is also recommended to ensure that the applicant adheres to the day-to-day construction schedule assumed for the impacts assessment (**AQ-C7**).

Ambient air monitoring (**AQ-C5**) is recommended by staff specially for this project because of the proximity of the Romoland Elementary School and the potential for construction to exacerbate existing PM_{10} concentrations. During dust-intensive activities, further control would be initiated if ambient monitors near the fence line detect differences in the upwind and downwind PM_{10} concentrations of greater than 5 $\mu g/m^3$. Maintaining the difference in fence line concentrations to an increase of no more than 5 $\mu g/m^3$ would be likely to cause less than a 1 $\mu g/m^3$ increase at the school. Controlling and verifying control of fugitive dust to this level would adequately mitigate fugitive dust impacts to the community.

With the implementation of the staff-recommended construction mitigation measures, the PM_{10}, ozone, and SO_2 impacts from the construction of IEEC can be reduced to a level of insignificance.

Operations Mitigation

Assuming proper offsets would be eventually acquired to satisfy the SCAQMD offset requirements, CEC staff recommends further mitigation for only the additional PM_{10} emitted by the cooling tower. Because the SCAQMD considers the cooling tower exempt, the PM_{10} emissions from the cooling tower are not included in the SCAQMD definition of PM_{10} offset liability. Because PM_{10} offsets may not be available to this source through Priority Reserve (Rule 1309.1(a)(5)(H)), staff suggests a range of available mitigation strategies for the cooling tower PM_{10} impacts including ERCs.

Cooling tower impacts could be mitigated through PM_{10} offsets or offsets of PM_{10} precursor pollutants (i.e., NOx, SO_2, or VOC) if they are available. To accomplish this, staff recommends a Condition of Certification (**AQ-C13**) that the applicant provide the additional 79 lb/day of emission offsets to mitigate the cooling tower PM_{10} emissions. Additionally, staff is recommending conditions (**AQ-C11 to AQ-C12**) to require reporting of cooling tower water flow, water quality data, and PM_{10} emission estimates to demonstrate that the emission rate of 79 lb/day would not be exceeded. Implementing these measures would reduce the PM_{10} impacts to a level of insignificance.

If offsets of PM_{10} or PM_{10} precursors are unavailable, an alternative mitigation approach for the cooling tower would need to be created. Energy Commission staff suggests the mitigation occur at IEEC or locally in Romoland. Opportunities for local PM_{10} improvements could include implementing dry cooling technology for the IEEC, providing mobile source emission reductions through upgrades to local school bus fleets, or providing emission controls to the neighboring asphalt production, quarrying, or concrete facilities. Although any of these approaches could effectively reduce the PM_{10} impacts to a level of insignificance, Energy Commission staff would need further input from the applicant in developing an alternative strategy.

CUMULATIVE IMPACTS

To evaluate reasonably foreseeable future projects as part of a cumulative impact analysis, staff needs specific and timely information, usually directly from the District. The time in which a probable future project is well enough defined to have the information necessary to perform a modeling analysis is usually when that project applicant has submitted an application to the District for a permit. Air dispersion modeling required by the District would necessitate that the applicant develop the necessary modeling input parameters to perform a modeling analysis. Therefore, staff evaluates those future projects that are currently under construction, or are currently under District review in our cumulative impact analysis. Projects located up to six miles from the proposed facility site usually need to be included in the analysis.

The applicant obtained an inventory from SCAQMD identifying proposed new sources within 10 kilometers (more than six miles) of IEEC that have not yet commenced operations (Calpine 2001e). The search requested those sources that had new permits issued or new applications filed between January 1999 and October 2001. Sources with permits issued prior to this would be represented by the background conditions. The SCAQMD identified 18 sources, including eleven that make up the IEEC itself and two sources of strictly organic compounds. The remaining five sources were included in the cumulative analysis. The cumulative sources include a new landfill gas-fired internal combustion engine in Perris, new concrete molding equipment in Romoland, new pharmaceutical manufacturing in Lakeview, and an emergency generator in Hemet.

The maximum modeled cumulative impacts of IEEC with the other new sources are presented below in **AIR QUALITY Table 17**. The total impact is conservatively estimated to be the maximum modeled impact plus the staff-recommended maximum existing background concentration from 1997-2001.

AIR QUALITY Table 17
IEEC, Impacts from Cumulative Sources(in µg/m^3)

Pollutant	Averaging Period	Cumulative Impact	Back-ground	Total Impact	Limiting Standard	Type of Standard	Percent of Standard
PM_{10}	24-hour	10.0	**139**	**149**	50	CAAQS	**298**
	AGM	1.5	**44**	**45**	30	CAAQS	**152**
	AAM	1.5	**50**	**51**	50	NAAQS	**103**
NO_2	1-hour	88.4	274	363	470	CAAQS	77
	Annual	1.1	36	37	100	NAAQS	37
CO	1-hour	799.9	12,650	13,450	23,000	CAAQS	58
	8-hour	419.7	6,302	6,722	10,000	NAAQS	67
SO_2	1-hour	3.1	288	291	650	CAAQS	44
	3-hour	---	---	---	1,300	NAAQS	---
	24-hour	1.2	100	101	105	CAAQS	96
	Annual	0.2	5	5	80	NAAQS	7

Source: Attachment 1 Calpine 2001e.

Notes: Based on Riverside meteorological data as required by SCAQMD.

(a) Independent staff analysis was necessary for NO_2 and CO (1-hour) to address IEEC startup as discussed in **AIR QUALITY Table 11**.

(b) Hourly impacts do not show the effects of emergency generator testing at IEEC. See independent staff analysis using OLM with alternative meteorological data (1997-2001, as in AIR QUALITY Table 14) for a more refined evaluation of impacts during testing of emergency generator.

The results of the cumulative analyses show that the other new cumulative sources would not substantially change the impacts that would occur solely with IEEC. When compared to maximum impacts during routine operation of IEEC, the other sources do not change affect the cumulative impacts. Cumulative impacts are expected to be below the state and national standards for all pollutants except PM_{10}. For NO_2, independent staff analysis described above (see, **AIR QUALITY Impacts with Alternative Meteorological Data**) uses OLM and the alternative meteorological data to show that the impacts from IEEC emergency generator would not cause a violation of the 1-hour NO_2 standard. The cumulative analysis (and a comparison of **Table 17** with **Table 11**) reveals that cumulative impacts would be nearly identical to the impacts from routine operation of IEEC. Therefore, no additional mitigation, beyond what would be required for solely the IEEC, would be necessary to respond cumulative impacts.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the IEEC (please refer to **Socioeconomics Figure 1** in this Staff Assessment). However, as indicated in **Socioeconomics Figure 1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius; staff considers these to be pockets or clusters. Staff also reviewed Census 1990 information that shows the low-income population is less than fifty percent within the same radius. Because staff has determined there to be pockets or clusters of minority population within the six-mile radius, staff has conducted a focused environmental justice analysis for air quality.

The highest air quality impacts during construction (mainly PM_{10} impacts) would occur close to the IEEC site and to the southeast, which is usually downwind. For operation, the PM_{10} and ozone impacts tend to occur in the more distant hills. Minority pockets or clusters located to the southeast and elsewhere in the immediate vicinity of the site could experience disproportionate air quality impacts during construction. To address this, staff recommends a range of mitigation especially for construction impacts near the site boundary. The mitigation would include rigorous parametric monitoring of construction dust emissions, with ambient monitoring being recommended by staff for compliance assurance. With the recommended mitigation, construction and operation impacts would be reduced to a level of insignificance. Based on this analysis, staff has not identified any unmitigated significant direct or cumulative impacts resulting from the construction or operation of the project, and therefore there are no air quality environmental justice issues related to this project.

COMPLIANCE WITH LORS

FEDERAL

The SCAQMD (District) is responsible for issuing the Federal Prevention of Significant Deterioration (PSD) permit. Although the Preliminary Determination of Compliance (PDOC, SCAQMD 2002x) indicates that the IEEC would comply with applicable PSD requirements, the U.S. EPA, other agencies, and the public have not yet had opportunity to comment. Without U.S. EPA involvement, Energy Commission staff cannot make a final recommendation as to whether the project is in compliance with the PSD requirements.

A PSD permit would be part of the Permit to Construct, which will be issued by the SCAQMD if the Energy Commission grants the project a license.

STATE

Staff believes that if the appropriate mitigation is provided to demonstrate compliance with the SCAQMD Rules and Regulations (e.g., requirements for offsets or participation in Priority Reserve) and Energy Commission recommendations (e.g., for cooling tower impacts), the project would demonstrate compliance with California State Health and Safety Code, Section 41700.

LOCAL

The SCAQMD completed a Preliminary Determination of Compliance (PDOC, SCAQMD 2002x) for this project dated June 21, 2002. The PDOC was provided electronically to CEC staff on June 26, 2002, and a 30-day public comment period was scheduled to begin July 16. Because a complete offset package has not been identified at this time; staff believes that at present, the proposed project cannot be found in compliance with the District's Rules and Regulations. Additionally, the BACT determination in the PDOC may not be consistent with U.S. EPA recommendations, which could identify a need for more stringent NOx and CO control of gas turbine and duct burner emissions. After U.S. EPA review of the PDOC and the public comment period, the SCAQMD will prepare a Final Determination of Compliance (FDOC)

Compliance with substantive SCAQMD Rules and Regulations is reviewed below. For additional discussion of the compliance of the IEEC with local regulations please refer to the PDOC (SCAQMD 2002x).

Regulation II – Permits

The applicant will be in substantial compliance of this regulation upon receipt of the FDOC. The Permit to Construct would be issued by the District if the Energy Commission grants the project a license.

Rule 218 – Continuous Emission Monitoring

Installation and operation of CO CEMS will need to comply with the requirements of this rule, and the applicant would need to submit a CEMS application for District review and approval prior to installing the CEMS. (Continuous monitoring for NOx emissions or ammonia is required under new source review regulations of Regulations XIII and XX, discussed further below.)

Regulation IV – Prohibitions

Rule 401 – Visible Emissions

Visible emissions are not expected under normal operating conditions of the turbines. During construction, staff's proposed Conditions of Certification (**AQ-C2** and **AQ-C3**) require periodic monitoring of airborne dust.

Rule 402 – Nuisance

Nuisance problems are not expected under normal operating conditions of the turbines, auxiliary boiler, cooling tower or ammonia storage system.

Rule 403 – Fugitive Dust

The applicant will be required to submit a fugitive dust plan to both the District and the Energy Commission. During construction the applicant would need to maintain rigorous records reflecting implementation of the fugitive dust measures to qualify for the exemption from the 50 $\mu g/m^3$ up- and down-wind ambient limit in Rule 403. Staff's proposed Conditions of Certification (**AQ-C2** and **AQ-C3**) require reporting of the fugitive dust control actions in conjunction with ambient monitoring (**AQ-C5**) to provide compliance assurance.

Rule 407 – Liquid and Gaseous Air Contaminants

This rule contains limits for CO emissions, but they are not as stringent as the new source review limits of Regulation XIII. Compliance will be verified through CEMS data.

Rule 409 – Combustion Contaminants

Limits PM emissions to 0.1 gr/scf. This limit is not as stringent as the applicant's proposed PM_{10} emission rate. Compliance will be verified through initial performance tests as well as periodic testing as required by Title V.

Rule 431.1 – Sulfur Content of Gaseous Fuels

Pipeline natural gas is expected to meet the limit of this rule. Compliance will be verified with periodic testing of the fuel.

Rule 431.2 – Sulfur Content of Liquid Fuels

This rule establishes a sulfur content limit for diesel fuel of 0.05% by weight, as well as, record keeping requirements and test methods. Low-sulfur diesel fuel for use in the emergency fire pump engine would comply with this limit.

Rule 475 – Electric Power Generating Equipment

Power generating equipment with capacity greater than 10 MW is required by this rule to meet a general limit for combustion contaminants (combustion contaminants are defined as particulate matter in AQMD Regulation I). However, the limit of this rule is not as stringent as the applicant's proposed PM_{10} emission rate. Compliance will be verified through the initial performance test as well as periodic testing required by Title V.

Regulation IX – Standards of Performance for New Stationary Sources

Regulation IX incorporates the federal New Source Performance Standards (NSPS) of the Code of Federal Regulations (40 CFR 60). For IEEC, the relevant NSPS are for electric utility steam generators (Subpart Da) and stationary gas turbines (Subpart GG). These regulations establish emission limits, test methods, and monitoring for particulate matter, SO_2, and NO_2, although the emission limits are not as stringent as the applicant's proposed emission rates. Compliance will be verified by performance testing and recordkeeping.

Regulation XIII – New Source Review

This regulation includes the requirements for managing the emissions of non-attainment contaminants and their precursors along with ammonia by requiring use of Best Available Control Technologies (BACT), offsets, and modeling. For IEEC, emissions of NOx will be regulated by Regulation XX (RECLAIM).

Staff cannot determine that IEEC is in compliance with the requirements of Regulation XIII based on the information in the PDOC (SCAQMD 2002x). The PDOC would notably require more-stringent NOx and PM_{10} levels for the auxiliary boiler, but would not limit NOx and CO emissions from the gas turbines and duct burners beyond the levels proposed by the applicant. The U.S. EPA is expected to provide comment on the BACT decision of the PDOC, and the applicant is still in the process of obtaining all of its required emission reduction credits for CO, PM_{10}, and SO_2.

Rule 1309.1 – Priority Reserve

The applicant has proposed entering the Priority Reserve program to obtain offsets for both PM_{10} and SO_2 (Calpine 2002a). The Priority Reserve requirements include depleting existing ERCs for these pollutants, paying non-refundable funds to the District, entering into a long-term agreement for power sales, and bringing the facility to rated capacity within three years of Energy Commission certification. Because the applicant has not demonstrated progress or how it would comply with these requirements, staff cannot determine that IEEC is in compliance with this rule.

Regulation XVII – Prevention of Significant Deterioration

The PSD permit will be issued by the District as part of the Permit to Construct after obtaining U.S. EPA and public comment on the PDOC.

Regulation XX – Regional Clean Air Incentives Market (RECLAIM)

Because the applicant is in the process of obtaining the required RTCs, Energy Commission staff cannot determine that IEEC is in compliance with this rule.

Regulation XXX – Title V Permits

The District will issue the Title V permit as part of the Permit to Construct after the Commission has certified the project.

Regulation XXXI – Acid Rain Permits

The District will issue the Title IV Acid Rain permit as part of the Permit to Construct. Compliance with the monitoring requirements of the acid rain provisions will be verified through the use of gas meters in conjunction with gas analyses.

FACILITY CLOSURE

Eventually the IEEC will close, either as a result of the end of its useful life, or through some unexpected situation such as a natural disaster or catastrophic facility breakdown. When the facility closes, all sources of air emissions would cease and thus all impacts associated with those emissions would cease as well.

A Permit to Operate, issued by the District, is required for operation of the facility. If the applicant chooses to close the facility or fails to pay appropriate permit fees, then the Permit to Operate would be cancelled. In that event, the project could not restart and operate unless the applicant complied with state and District requirements and paid the fees to renew the Permit to Operate.

When the applicant decides to dismantle the project, there will potentially be emissions associated with the dismantling effort. The Facility Closure Plan to be submitted to the Energy Commission Compliance Project Manager will include the specific details regarding how the applicant plans to comply with all local, state and federal rules and regulations during facility closure and demolition.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

AGENCY COMMENTS

California Department of Education and Romoland School District

Comment: *The California Department of Education and Romoland School District have provided comments regarding hazardous air emissions and general air quality concerns. The Romoland School District has also specifically raised concerns regarding the ability of regional offsets to provide local mitigation and the accuracy of the dispersion modeling analysis in the AFC (RSD 2001a, R&T 2002b).*

Response: Staff addresses the California Department of Education concerns regarding school siting and potential health hazards from project-related air emissions in the **Hazardous Materials** and **Public Health** sections of this Staff Assessment.

The Romoland School District contends that regional offsets would not mitigate local impacts caused by the IEEC. Regional offsets proposed by the applicant would provide emission reductions at locations within the South Coast Air Basin, the majority of which tends to be upwind of Romoland. The emission reductions would help to reduce background concentrations, which are already substantially elevated in the project area. By providing reductions to background concentrations, Energy Commission staff considers offsets a suitable strategy for project mitigation.

Staff addresses the concerns of the school district regarding the dispersion modeling methodology in this analysis (see **AIR QUALITY Impacts with Alternative Meteorological Data**).

PUBLIC COMMENTS

American Lung Association of the Inland Counties

Comment: *The American Lung Association of the Inland Counties has identified the IEEC project as an example of a "clean conventional power source," that would be preferable to other energy sources except conservation efforts and clean renewable sources (NJR 2002a).*

Response: None necessary.

CONCLUSIONS AND RECOMMENDATIONS

As of this writing, the applicant does not have a complete offset package that satisfies routine SCAQMD permitting requirements or the Energy Commission staff need for CEQA mitigation (see **AIR QUALITY Table 16**). Because the offset package is substantially undefined, Energy Commission staff and the public cannot review or comment on the complete strategy at this time, and staff cannot determine that IEEC is in compliance with the SCAQMD offset rules. Additionally, if the facility does enter the Priority Reserve program, how the applicant would fulfill all of the program requirements remains unclear.

Additionally, the BACT determination of the PDOC appears to be inconsistent with recent U.S. EPA guidance that has identified more stringent NOx and CO levels as being demonstrated in practice. The U.S. EPA is expected to provide comment on the BACT decision of the PDOC. Until U.S. EPA participation occurs, staff cannot determine that IEEC is in compliance with the SCAQMD rules for BACT.

With or without this information, the District will complete their Final Determination of Compliance (FDOC) after the statutory comment periods. The District cannot issue the

Title V Permit until the applicant provides a complete offset package and after the Commission certifies the project.

Staff cannot recommend certification of the IEEC project at this time. The applicant needs to meet the offset and BACT requirements of the District for the District to complete its FDOC. Additionally, the applicant needs to provide the staff-recommended CEQA mitigation (in **AQ-C13** or an appropriate alternative strategy) for PM_{10} impacts from the cooling tower. Upon resolution of these issues, staff would recommend the following Conditions of Certification to address the impacts and appropriate mitigation for the construction and operation of the IEEC.

CONDITIONS OF CERTIFICATION

AIR QUALITY Table 18 correlates the District proposed conditions from the Preliminary Determination of Compliance to the staff proposed Conditions of Certification. It is staff's opinion that this table is necessary due to the complex nature of the District's permitting system. The table shows the staff conditions of certification in the far left column and the corresponding District condition in the far right column. The middle column is a brief description of the intent of each proposed condition.

AIR QUALITY Table 18
Commission Staff ~ District
Conditions of Certification

Commission	Notes	District
CEC Staff Conditions		
Staff Construction Conditions		
AQ-C1	Construction Mitigation Manager/Fugitive Dust Mitigation Manager requirement.	NA
AQ-C2	Monthly Compliance Report requirement.	NA
AQ-C3	Construction Fugitive Dust Mitigation Plan requirement.	NA
AQ-C4	Diesel Construction Equipment Mitigation Plan requirement.	NA
AQ-C5	Ambient Air Monitoring Program requirement.	NA
AQ-C6	Gasoline Construction Equipment Mitigation Plan requirement.	NA
AQ-C7	Site preparation daily schedule limitation.	NA
Staff Operating Conditions		
AQ-C8	Air permit modification notification and approval	NA
AQ-C9	Quarterly Operation Report requirement.	NA
AQ-C10	Requires that the project owner provide offset documentation.	NA
AQ-C11	Requires cooling tower water testing to ensure emission estimates for the cooling tower are not underestimated.	NA
AQ-C12	Specifies cooling tower PM_{10} emission limit (79 lb/day).	NA
AQ-C13	Requires IEEC to obtain additional PM_{10} offsets to mitigate the cooling tower PM_{10} emissions.	NA
AQ-C14	Restricts simultaneous commissioning of turbines.	NA
AQ-C15	Restricts simultaneous startup of turbines.	NA
AQ-C16	Requires fuel sulfur content monitoring.	NA
District Conditions		
Facility Conditions		
AQ-1	Opacity limitation.	F9-1
AQ-2	Diesel fuel sulfur content limit.	F14-1
AQ-3	Fuel oil (inc. diesel) sulfur content limit (eff. date 6/1/2004).	F14-2
AQ-4	Accidental release requirements.	F24-1
Gas Turbine/Duct Burner/SCR Systems Conditions		
AQ-5	Ammonia injection monitoring.	12-1
AQ-6	SCR temperature monitoring.	12-2
AQ-7	SCR pressure monitoring.	12-3
AQ-8	Initial source testing requirement for the following pollutants: NO_x, CO, SO_x, ROG, PM_{10}, ammonia.	29-1

Commission	Notes	District
AQ-9	Ongoing source testing requirement for ammonia. Quarterly for first 12 months and annually thereafter.	29-2
AQ-10	Ongoing (every 3 years) source testing requirement for the following pollutants: SO_x, ROG and PM_{10}.	29-3
AQ-11	Source test requirements in addition to 29-1.	40-1
AQ-12	Monthly emissions limits.	63-1
AQ-13	Record keeping requirement for natural gas fuel use.	67-1
AQ-14	CEMS CO monitoring and reporting requirements	82-1
AQ-15	CEMS NO_x monitoring and reporting requirements	82-2
AQ-16	Exception for NO_x limit (2.5 ppm) during commissioning, startup, and shutdown periods. Limit on commissioning (636 hours). Limit on startup (1 hour, 1 per day). Limit on shutdown (30 minutes, 1 per day).	99-1
AQ-17	Exception for CO limit (6.0 ppm) during commissioning, startup, and shutdown periods. Limit on commissioning (636 hours). Limit on startup (1 hours, 1 per day). Limit on shutdown (30 minutes, 1 per day).	99-2
AQ-18	Exception for NO_x limit (88.43 lbs/MMCF) during interim period not to exceed 12 months from initial startup date.	99-3
AQ-19	Ammonia injection and SCR temperature monitoring calculation requirement.	179-1
AQ-20	SCR pressure monitoring calculation requirement.	179-2
AQ-21	Hourly NO_x limit (2.5 ppmvd @ 15%O_2, 1 hour average).	195-1
AQ-22	Hourly CO limit (6.0 ppmvd @ 15%O_2, 3 hour average).	195-2
AQ-23	Hourly VOC limit (2.0 ppmvd @ 15%O_2, 1 hour average).	195-3
AQ-24	Hourly ammonia limit (5 ppmvd @ 15%O_2, 1 hour average).	195-4
AQ-25	CEMS NH_3 monitoring requirement.	232-1
AQ-26	Requires IEEC to retain adequate RTCs for operation.	296-1
AQ-27	Combustion contaminant emissions limitation.	327-1
NA	Requires IEEC to operate in accordance with mitigation measures stipulated in the final commission decision.	193-1
Auxiliary Boiler Conditions		
AQ-28	Ammonia injection monitoring.	12-1
AQ-29	SCR temperature monitoring.	12-2
AQ-30	SCR pressure monitoring.	12-3
AQ-31	Ongoing (every 3 years) source testing requirement for the following pollutants: SO_x, ROG and PM_{10}.	29-3
AQ-32	Initial source testing requirement for the following pollutants: NO_x, CO, SO_x, ROG, PM_{10}, ammonia.	29-4
AQ-33	Source test requirements in addition to 29-4.	40-2
AQ-34	Monthly emissions limits.	63-2
AQ-35	CEMS CO monitoring and reporting requirements.	82-3
AQ-36	CEMS NO_x monitoring and reporting requirements.	82-4
AQ-37	Exception for NO_x limit (38.46 lbs/MMCF) during interim period not to exceed 12 months from initial startup date.	99-4
AQ-38	Ammonia injection and SCR temperature monitoring calculation requirement.	179-1
AQ-39	SCR pressure monitoring calculation requirement.	179-2
AQ-40	Hourly NO_x limit (7 ppmvd @ 3%O_2, 1 hour average).	195-4
AQ-41	Hourly CO limit (50 ppmvd @ 3%O_2, 1 hour average).	195-5
AQ-42	CEMS NH_3 monitoring requirement.	232-2
AQ-43	Requires IEEC to retain adequate RTCs for operation.	296-1
NA	Requires IEEC to operate in accordance with mitigation measures stipulated in the final commission decision.	193-1

Commission	Notes	District
Emergency Generator and Fire Pump Engine Conditions		
AQ-44	Engine annual operating limit (200 hours).	1-1
AQ-45	Operating time meter requirement.	12-4
AQ-46	Fuel use meter requirement.	12-5
AQ-47	Record keeping requirement.	67-2
Ammonia Storage Tank Conditions		
AQ-48	Venting limitation.	144-1
AQ-49	Pressure relief valve setting (25 psig).	157-1

NA – not applicable.

STAFF CONDITIONS

Staff Construction Conditions

AQ-C1 The project owner shall submit the resume(s) of their selected Construction Mitigation Manager(s) (CMM) and Fugitive Dust Mitigation Managers(s) (FDMM) to the CEC Compliance Project Manager (CPM) for approval. The project owner shall be responsible for funding the costs of the CMM and FDMM, however the CMM and FDMM shall report to the CPM. The CMM and FDMM positions can be filled by one person or more who shall preferably have a minimum of eight years experience as follows; however the CPM will consider all resumes submitted regardless of experience:

- five years construction experience, as a subcontractor or general contractor.
- Must have an engineering degree or equivalent or an additional five years construction experience.
- one year construction project management experience.
- two years air quality assessment experience.
- Either the CMM or FDMM shall be certified by the State of California for Visible Emissions Evaluation (EPA Method 9), or be able to obtain certification prior to the initiation of construction activities.

Protocol: The project owner shall make available a dedicated office for both the CMM and FDMM. The CMM shall be responsible for implementing all mitigation measures related to construction equipment combustion emissions, as outlined in Conditions of Certification **AQ-C4** and **AQ-C6**. The FDMM shall be responsible for monitoring and enforcing the effectiveness of all mitigation measures for construction as outlined in Conditions of Certification **AQ-C3** and **AQ-C5**. A CMM shall be onsite or available to be onsite at any time, until deemed no longer necessary by the CPM. A FDMM shall be on-site during all construction activities, until deemed no longer necessary by the CPM. The CMM and FDMM shall be granted access to all areas of the main and related linear facility construction sites. The CMM and FDMM shall have the authority to stop construction on either the main power plant or the related linear facility construction sites as warranted by specific mitigation measures. The CMM and/or FDMM may be replaced but may not

be terminated prior to the cessation of all construction activities unless approval is granted by the CPM.

Verification: The project owner shall submit the CMM and FDMM resume(s) to the CPM for approval at least 60 days prior to site mobilization.

AQ-C2 The CMM and FDMM shall submit to the CPM via the Monthly Compliance Report (MCR), documentation that summarizes all compliance actions taken germane to Conditions of Certification **AQ-C3** through **AQ-C7**. The documentation shall include, at a minimum, the following elements:

Fugitive Dust Mitigation Monthly Report
(see Condition of Certification AQ-C3, AQ-C5, and AQ-C7)

- Identification of specific mitigation measure performed, the location performed, date performed and date enforced or verified as remaining effective.
- Identification of any transgressions or circumventions of mitigation measure and the actions taken to correct the situation.
- Identification of any observation by the FDMM of dust plumes beyond the property boundary of the main construction site or beyond an acceptable distance from the linear construction site and what actions (if any) where taken to abate the plume.
- A summary report of all ambient air monitoring data.
- Identification of daily fugitive dust producing operations, including the daily schedule for initial site preparation work activities (i.e. scraping, grading, trenching, and other earth moving activities).
- Identification of daily schedule of operation of construction equipment rated over 100 brake horsepower.

Diesel Construction Equipment Mitigation Monthly Report
(see Condition of Certification AQ-C4)

- Identification of any changes, as approved by the CPM, to the Diesel Construction Equipment Mitigation Plan from the initial report or the last monthly report including any new contractors and their diesel construction equipment.
- Copies of all receipts or other documentation indicating type and amount of fuel purchased, from whom, where delivered and on what date for the main and related linear construction sites.
- Identification and verification of all diesel engines required to meet EPA or CARB 1996 off-road diesel equipment emission standards.
- The suitability of the use of a catalyzed diesel particulate filter for a specific piece of construction equipment is to be determined by a qualified mechanic or engineer who must submit a report through the CMM to the CPM for approval. The identification of any suitability report being initiated,

pursued or the completed report should be included the monthly report (in the month that it was completed) as should the verification of any subsequent installation of a catalyzed diesel particulate filter.

- Identification of any observation by the CMM of dark plumes emanating from diesel-fire construction equipment beyond the property boundary of the main construction site or beyond an acceptable distance from the linear construction site and what actions (if any) where taken to abate the plume or future expected plumes.

Gasoline Construction Equipment Mitigation Monthly Report (see Condition of Certification AQ-C6)

- Identification of any change, as approved by the CPM, to the Gasoline Construction Equipment Mitigation Plan from the initial report or the last monthly report, including any new contractors and their gasoline construction equipment.
- Copies of all receipts or other documentation indicating the amount of gasoline purchased, from whom, where delivered and on what date for the main and related linear construction sites.
- Identification and verification of all gasoline engines required to meet California Emission Standards for Small Off-Road Engines, and all gasoline engines required to have catalytic converters and/or meet California on-road emission standards.
- Identification of any observation by the CMM of dark plumes emanating from gasoline-fired construction equipment beyond the property boundary of the main construction site or beyond an acceptable distance from the linear construction site and what actions (if any) where taken to abate the plume or future expected plumes.

Verification: The CMM and FDMM shall provide records of compliance as part of the MCR, while construction is occurring at the main or related linear construction sites.

AQ-C3 he FDMM shall prepare and submit for approval to the CPM, a Fugitive Dust Mitigation Plan (FDMP) that specifically identifies all fugitive dust mitigation measures that will be employed for the construction of the facility and is administered on site by the full time FDMM.

Protocol: The construction mitigation measures that shall be addressed in the FDMP include, but are not limited to, the following:

- Identification of the employee parking area(s) and surface type(s) of the parking area(s);
- The frequency of watering of unpaved roads and all disturbed areas;
- Application of chemical dust suppressants;
- Gravel in high traffic areas;

- Paved access aprons;
- Sandbags to prevent run off;
- Posted speed limit signs;
- Wheel washing areas prior to large trucks leaving the project site;
- Methods that will be used to clean tracked-out mud and dirt from the project site onto public roads;
- For any transportation of borrowed fill material,
    1. Vehicle covers;
    2. Wetting of the transported material;
    3. Appropriate freeboard;
- Methods for the stabilization of storage piles and disturbed areas;
- Windbreaks at appropriate locations;
- The suspension of all earth moving activities under windy conditions (sustained winds above 25 mph); and,
- On-site monitoring devices.
- Additional mitigation measures to be implemented at the direction of the FDMM in the event that the standard measures fail to completely control dust from any activity and/or source.

Protocol: In monitoring the effectiveness of all mitigation measures included in the FDMP, the FDMM shall take into account the following, at a minimum:

a) Onsite spot checks of soil moisture content at locations where soil disturbance, movement and/or storage is occurring;

b) Visual observations of all construction activities; and

c) The results of measurements by portable PM_{10} instruments (as described in **AQ-C5**).

Protocol: The FDMM shall implement the following procedures for additional mitigation measures if the FDMM determines that the existing mitigation measures are not resulting in adequate mitigation.

1. The FDMM shall direct more aggressive application of the existing mitigation methods within fifteen (15) minutes of making such a determination.

2. The FDMM shall direct implementation of additional methods of dust suppression if step #1 specified above fails to result in adequate mitigation within 30 minutes of the original determination.

3. The FDMM shall direct a temporary shutdown of the source of the emissions if step #2 specified above fails to result in adequate mitigation within one (1) hour of the original determination. The activity shall not restart until one (1) full hour after the shutdown. The project owner may appeal to the CPM any directive from the FDMM to shutdown a source, provided that the shutdown shall go into effect within one (1) hour of the original determination unless overruled by the CPM before that time.

   Protocol: These additional mitigation requirements are triggered by a difference in the upwind and downwind monitored PM_{10} concentration of greater than 5 $\mu g/m^3$; visual observation of airborne dust migrating from the construction area(s); visual observation of mud or dirt track-out onto public roads; or other signs of dust mitigation measure ineffectiveness observed by the FDMM.

Verification: At least 30 days prior to site mobilization, the project owner shall provide the CPM with a copy of the Fugitive Dust Mitigation Plan (FDMP) for approval.

AQ-C4 The CMM shall prepare and submit to the CPM for approval a Diesel Construction Equipment Mitigation Plan (DCEMP) that will specifically identify diesel engine mitigation measures that will be employed during the construction phase of the main and related linear construction sites. The CMM will be responsible for implementing and maintaining all measures identified in the DCEMP. The DCEMP shall address, at a minimum, the following mitigation measures:

- Catalyzed diesel particulate filters (CDPF);
- CARB certified ultra low sulfur diesel fuel (ULSD), containing 15 ppm sulfur or less;
- Diesel engines certified to meet EPA and/or CARB 1996 or better off-road equipment emission standards.
- Restricting diesel engine idle time, to the extent practical, to no more than 10 minutes.

Protocol: The Diesel Construction Equipment Mitigation Plan must include the following:

1. A list of all diesel-fueled, off-road, stationary or portable construction-related equipment to be used either on the main or the related linear construction sites. This list will be initially estimated and then subsequently updated, as specific information becomes available. Prior to a contractor gaining access to the main or related linear construction sites, the CMM will submit to the CPM for approval, an update of this list with regard to that contractor's diesel construction equipment.

2. Each piece of construction equipment listed under item #1 of this condition must demonstrate compliance according to the following mitigation requirements, except as noted in items #3, #4 and #5 of this condition:

Engine Size (BHP)	1996 CARB or EPA Certified Engine	Required Mitigation
< 100	NA	ULSD
> or = 100	Yes	ULSD
> or = 100	No	ULSD and CDPF, if suitable as determined by the CMM

3. If the construction equipment is intended to be on-site for ten (10) days or less, then none of the mitigation measures identified in item #2 of this condition are required.
4. The CPM may grant relief from the mitigation measures listed under item #2 of this condition for a specific piece of equipment if the CMM can demonstrate that they have made a good faith effort to comply with the mitigation measures and that compliance is not possible.
5. Any implemented mitigation measure in item #2 of this condition may be terminated immediately if one of the following conditions exists; however the CPM must be informed within ten (10) working days of the termination:
   - 5.1 The measure is excessively reducing normal availability of the construction equipment due to increased downtime for maintenance, and/or power output due to an excessive increase in back pressure.
   - 5.2 The measure is causing or is reasonably expected to cause significant engine damage.
   - 5.3 The measure is causing or is reasonably expected to cause a significant risk to workers or the public.
   - 5.4 Any other seriously detrimental cause which has approval by the CPM prior to the termination being implemented.
6. All contractors must agree to limit diesel engine idle time on all diesel-powered equipment to no more than ten (10) minutes, to the extent practical.

Verification: The CMM shall submit the initial Diesel Construction Equipment Mitigation Plan (DCEMP) to the CPM for approval at least 30 days prior to site mobilization. The CMM will update the initial DCEMP as necessary, no less than ten days prior to a specific contractor gaining access to either the main or related linear construction sites. The CMM will notify the CPM of any emergency termination within ten working days of the termination.

AQ-C5 The FDMM shall prepare and implement an Ambient Air Monitoring Program (AAMP) to measure PM_{10} emissions during excavation, earthmoving and

grading activities. The project owner shall submit the AAMP to the CPM for review and approval. The AAMP shall include, at a minimum, the following:

1. The use of real-time PM_{10} monitoring instruments;

2. The simultaneous use of upwind and downwind monitors continuously during these activities;

3. Description of how the monitors will be used to assess the effectiveness of the mitigation measures implemented under the FDMP, including assessing the potential need for monitoring multiple activities on site simultaneously;

Verification: The AAMP shall be included as part of the FDMP required by Condition of Certification **AQ-C3**. Monitoring records, including monitoring data from all upwind and downwind monitors, and records of dust suppression measures implemented, shall be maintained on-site throughout construction and shall be made available to the CPM upon request. A summary of the monitoring records and the dust suppression activities shall be included in each MCR. Any changes to the AAMP or associated protocols require approval from the CPM.

AQ-C6 The project owner shall mitigate, to the extent practical, construction related emission impacts from gasoline-fired construction equipment. Measures that shall be used to mitigate construction impacts are as follows:

A. Small off-road gasoline powered construction equipment (i.e. 25 BHP or less) used at the project site and in the construction of the off-site water pipeline shall have been manufactured since 1995 and shall meet California Emission Standards for Small Off-Road Engines (California Code of Regulations Article 1 and Article 3, Chapter 9, Division 3, Title 13).

B. Large off-road gasoline powered construction equipment (i.e. over 25 BHP), if any are used at the site, shall be equipped with catalytic converters.

C. All on-road gasoline powered construction vehicles, excluding personal vehicles, shall meet California emission standards.

Protocol: The Gasoline Construction Equipment Mitigation Plan (GCEMP) shall be submitted to the CPM for approval prior to site mobilization, and must include the following:

1. A list of all gasoline fueled, off-road, on-road, stationary or portable construction-related equipment to be used either on the project construction site or the construction sites of the related linear facilities. Equipment used less than a total of 10 consecutive days need not be included in this list.

2. Each piece of construction equipment listed under item (1) must demonstrate compliance with the mitigation requirements (A) through (C) listed above.
3. If compliance cannot be demonstrated as specified under item (2), then the project owner may appeal for relief to the CPM. However, the owner must demonstrate that they have made a good faith effort to comply as specified under item (2).

Verification: The CMM shall submit the initial Gasoline Construction Equipment Mitigation Plan (GCEMP) to the CPM for approval at least 30 calendar days prior to site mobilization. The CMM will update the initial GCEMP as necessary, no less than ten days prior to a specific contractor gaining access to the main or related linear construction sites.

AQ-C7 During site mobilization, ground disturbance, and grading activities, the project owner shall limit the fugitive dust causing activities (i.e. scraping, grading, trenching, or other earth moving activities) to the hours of 7 am to 7 pm daily and shall limit the operation of all construction equipment rated over 100 brake horsepower to the hours of 7 am to 7 pm daily.

Verification: The project owner shall provide records of compliance as part of the MCR, as required in Condition of Certification **AQ-C2**.

Staff Operating Conditions

AQ-C8 The project owner shall submit to the CPM for review and approval any modification proposed by either the project owner or issuing agency to any project air permit.

Verification: The project owner shall submit the proposed air permit modification to the CPM within five working days of its submittal. The project owner shall submit all modified air permits to the CPM within 15 days of their receipt.

AQ-C9 The project owner shall submit to the CPM and District Air Pollution Control Officer (APCO) Quarterly Operation Reports, no later than 30 days following the end of each calendar quarter, that include operational and emissions information as necessary to demonstrate compliance with Conditions **AQ-C11**, **AQ-C12** and **AQ-1** through **AQ-49**, as applicable. The Quarterly Operation Report will specifically note or highlight incidences of noncompliance.

Verification: The project owner shall submit the Quarterly Operation Reports to the CPM and APCO no later than 30 days following the end of each calendar quarter.

AQ-C10 The project owner shall provide emission reduction credits to offset turbine and duct burner CO, VOC, SO_2 and PM_{10} emissions as specified by the District.

Verification: The project owner/operator shall submit to the CPM records showing that the project's District regulated emission reduction credit requirements have been met 15 days prior to initiating construction for Priority Reserve emission reduction credits, and 30 days prior to turbine first fire for traditional emission reduction credits.

AQ-C11 The project owner shall perform quarterly cooling tower recirculating water quality testing for total solids content (total dissolved and undissolved solids). The project owner shall also provide a flow meter to determine the daily cooling tower circulating water flow.

Verification: The project owner/operator shall submit to the CPM cooling tower recirculating water quality tests and daily recirculating water flow in the Quarterly Operation Reports.

AQ-C12 The cooling tower daily PM_{10} emissions shall be limited to 79 lb/day. The project owner shall estimate daily PM_{10} emissions from the cooling tower using the water quality testing data and daily circulating water flow data collected on a quarterly basis.

Verification: The project owner/operator shall submit to the CPM daily cooling tower PM_{10} emission estimates in the Quarterly Operation Reports.

AQ-C13 The project owner shall provide, for CEQA mitigation, PM_{10} or PM_{10} precursor emission reductions in the quantity of 79 lb/day to mitigate the cooling tower PM_{10} emissions. These emission offsets may come from the use of traditional PM_{10} or PM_{10} precursor (i.e., NOx, SO_2, or VOC) emission reduction credits, or through other means as accepted by the CPM. Emission reductions of SOx, NOx, or VOC shall be assigned to mitigate the project's 79 lb/day liability at a 1:1 ratio. The emission reductions shall have occurred prior to turbine first fire.

Verification: The project owner shall provide documentation that they have surrendered the required offsets for PM_{10} or PM_{10} precursors to the CPM 30 days prior to turbine first fire. If other means are planned to be used to mitigate the cooling tower PM_{10} emissions then the project owner shall provide the CPM with an emission reduction plan in the proper timeframe to allow for a 60 day review process and to accomplish the emission reductions prior to turbine first fire.

AQ-C14 The project owner shall minimize emissions of carbon monoxide and nitrogen oxides from the gas turbines and duct burners to the maximum extent possible during the commissioning period. Commissioning tests for one gas turbine shall not be conducted simultaneously with commissioning tests for the other.

Verification: See verification of Condition **AQ-16**. The project owner shall make the site available for inspection of the commissioning records and activities by representatives of the District, CARB and the Commission.

AQ-C15 The project owner shall limit emissions during startup periods so that startup of a gas turbine shall only occur when the other turbine is operating at steady state or the other turbine is not operating at all.

Verification: The project owner shall provide start-up and shutdown occurrence and duration data as part as part of the Quarterly Operation Report (**AQ-C9**). The project owner shall make the site available for inspection of the commissioning and start-up/shutdown records by representatives of the District, CARB and the Commission.

AQ-C16 The gas turbines and duct burners shall be fired on natural gas only. The sulfur content of the natural gas used shall not exceed 0.25 grains per 100 standard cubic feet of natural gas.

Verification: The project owner shall compile continuous fuel sulfur content monitoring data from the gas supplier, or if such data is not available, the project owner shall test the sulfur content of the natural gas fuel quarterly using recognized ASTM method(s). The fuel sulfur content data shall be submitted to the CPM in the Quarterly Operation Report (**AQ-C9**).

DISTRICT PRELIMINARY DETERMINATION OF COMPLIANCE CONDITIONS

Facility Conditions

AQ-1 Except for open abrasive blasting operations, the operator shall not discharge into the atmosphere from any single source of emissions whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is:

Protocol: (a) As dark or darker in shade as that designated No.1 on the Ringelmann Chart, as published by the United States Bureau of Mines; or

Protocol: (b) Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subparagraph (a) of this condition.

Verification: The project owner shall document any known opacity violations in the Quarterly Operation Report (**AQ-C9**). The project owner/operator shall make the site available for inspection by representatives of the District, CARB, EPA and the Commission.

AQ-2 The operator shall not use diesel fuel containing sulfur compounds in excess of 0.05 percent (500 ppm) by weight.

Verification: The project owner shall make fuel purchase, MSDS or other fuel supplier records containing diesel fuel sulfur content available for inspection by representatives of the District, CARB and the Commission upon request.

AQ-3 The operator shall not purchase fuel oil containing sulfur compounds in excess of 15 ppm by weight as supplied by the supplier.

Protocol: This condition shall become effective on or after June 1, 2004.

Verification: The project owner shall make fuel oil purchase, MSDS or other fuel supplier records containing diesel fuel sulfur content available for inspection by representatives of the District, CARB and the Commission upon request.

AQ-4 Accidental release prevention requirements of Section 112(r)(7):

a). The operator shall comply with the accidental release prevention requirements pursuant to 40 CFR Part 68 and shall submit to the SCAQMD Executive Officer, as a part of an annual compliance certification, a statement that certifies compliance with all of the requirements of 40 CFR Part 68, including the registration and submission of a risk management plan (RMP).

b). The operator shall submit any additional relevant information requested by the Executive Officer or designated agency.

Verification: The project owner shall submit to the District and the CPM the documents listed above as part of an annual compliance certification.

Gas Turbines, Duct Burners and SCR Units

Conditions of Certification AQ-5 through AQ-27 apply per turbine/HRSG unit unless otherwise identified.

AQ-5 The operator shall install and maintain a flow meter to accurately indicate the flow rate of the total hourly throughput of injected ammonia (NH_3).

Protocol: The operator shall also install and maintain a device to continuously record the parameter being measured.

Protocol: The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

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

AQ-6 The operator shall install and maintain a temperature gauge to accurately indicate the temperature in the exhaust at the inlet to the SCR reactor.

Protocol: The operator shall also install and maintain a device to continuously record the parameter being measured.

Protocol: The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

Verification: The project owner shall make the site available for inspection of the temperature gauge on the inlet to the SCR and the continuous temperature records by representatives of the District, CARB and the Commission.

AQ-7 The operator shall install and maintain a pressure gauge to accurately indicate the differential pressure across the SCR catalyst bed in inches water column.

Protocol: The operator shall also install and maintain a device to continuously record the parameter being measured.

Protocol: The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

Verification: The project owner shall make the site available for inspection of the SCR catalyst bed differential pressure gauge and the differential pressure records by representatives of the District, CARB and the Commission.

AQ-8 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
NO_x emissions	District Method 100.1	1 hour	Outlet of the SCR
CO emissions	District Method 100.1	1 hour	Outlet of the SCR
SO_x emissions	Approved District Method	District Approved Averaging Time	Fuel Sample
ROG emissions	Approved District Method	1 hour	Outlet of the SCR
PM emissions	Approved District Method	District Approved Averaging Time	Outlet of the SCR
NH_3 emissions	District Method 207.1 and 5.3 or EPA Method 17	1 hour	Outlet of the SCR

Protocol: The test shall be conducted after District approval of the source test protocol, but no later than 180 days after initial start-up. The District shall be notified of the date and time of the test at least 10 days prior to the test.

Protocol: The test shall be conducted to determine the oxygen levels in the exhaust. In addition, the tests shall measure the fuel flow rate (CFH), the flue gas flow rate, and the turbine and steam turbine generating output in MW.

Protocol: The test shall be conducted in accordance with a District approved source test protocol. The protocol shall be submitted to the AQMD engineer no later than 45 days before the proposed test date and shall be approved by the District before the test commences. The test protocol shall include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

Protocol: The test shall be conducted with and without duct firing when this equipment is operating at loads of 100, 75, and 50 percent of maximum load for the NO_x, CO, ROG and ammonia tests. For all other pollutants, the test shall be conducted with and without duct firing at 100% load only.

Verification: The project owner shall submit the proposed protocol for the initial source tests 45 days prior to the proposed source test date to both the District and CPM for approval. The project owner shall notify the District and CPM no later than 10 days prior to the proposed initial source test date and time. The project owner shall submit source test results no later than 60 days following the initial source test date to both the District and CPM.

AQ-9 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
SO_x emissions	Approved District Method	District Approved Averaging Time	Fuel Sample
ROG emissions	Approved District Method	1 hour	Outlet of the SCR
PM emissions	Approved District Method	District Approved Averaging Time	Outlet of the SCR

Protocol: The test(s) shall be conducted at least once every three years.

Protocol: The test shall be conducted and the results submitted to the District within 60 days after the test date. The AQMD shall be notified of the date and time of the test at least 10 days prior to the test.

Protocol: The test shall be conducted 1) when the gas turbine and the duct burners are operating simultaneously at 100 percent of maximum heat input and 2) when the gas turbine is operating alone at 100 percent of maximum heat input.

Protocol: The test shall be conducted to demonstrate compliance with the Rule 1303 concentration and/or monthly emissions limit.

Verification: The project owner shall submit the proposed protocol for the triennial source tests 60 days prior to the proposed source test date to both the District and CPM for approval. The project owner shall notify the District and CPM no later than 10 days prior to the proposed source test date and time. The project owner shall submit source test results no later than 60 days following the source test date to both the District and CPM.

AQ-10 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
NH_3 emissions	District Method 207.1 and 5.3 or EPA Method 17	1 hour	Outlet of the SCR

Protocol: The test shall be conducted and the results submitted to the District within 60 days after the test date. The AQMD shall be notified of the date and time of the test at least 7 days prior to the test.

Protocol: The test shall be conducted at least quarterly during the first twelve months of operation and at least annually thereafter. The NO_x concentration, as determined by the certified CEMS, shall be simultaneously recorded during the ammonia slip test. If the CEMS is inoperable or not yet certified, a test shall be conducted to determine the NO_x emissions using District Method 100.1 measured over a 60 minute averaging time period.

Protocol: The test shall be conducted to demonstrate compliance with the Rule 1303 concentration limit.

Verification: The project owner shall submit the proposed protocol for the ammonia slip source tests 60 days prior to the proposed source test date to both the

District and CPM for approval. The project owner shall notify the District and CPM no later than seven days prior to the proposed source test date and time. The project owner shall submit source test results no later than 60 days following the source test date to both the District and CPM.

AQ-11 The operator shall provide to the District a source test report in accordance with the following specifications:

Protocol: Source test results shall be submitted to the District no later than 60 days after the source test was conducted.

Protocol: Emission data shall be expressed in terms of concentration (ppmv), corrected to 15 percent oxygen (dry basis), mass rate (lbs/hr), and lbs/MM cubic feet. In addition, solid PM emissions, if required to be tested, shall also be reported in terms of grains per DSCF.

Protocol: All exhaust flow rates shall be expressed in terms of dry standard cubic feet per minute (DSCFM) and dry actual cubic feet per minute (DACFM).

Protocol: All moisture concentration shall be expressed in terms of percent corrected to 15 percent oxygen.

Protocol: Source test results shall also include the oxygen levels in the exhaust, the fuel flow rate (CFH), the flue gas temperature, and the generator power output (MW) under which the test was conducted.

Verification: See verifications for Conditions **AQ-8**, **AQ-9**, and **AQ-10**.

AQ-12 The operator shall limit emissions from this equipment as follows:

Contaminant	**Emissions Limit**
CO	10,255 LBS IN ANY 1 MONTH
PM_{10}	10,649 LBS IN ANY 1 MONTH
ROG	4,289 LBS IN ANY 1 MONTH
SO_x	1,200 LBS IN ANY 1 MONTH

Protocol: For the purpose of this condition, the limits shall be based on the combined emissions from equipment D1 (gas turbine) and D14 (duct burner), or the combined emissions from the equipment D2 (gas turbine) and D21 (duct burner).

Protocol: The operator shall calculate the emission limit(s) by using monthly fuel use data and the following emission factors: PM_{10} with duct burners firing 6.43 lbs/mmscf, PM_{10} without duct burners firing 6.13 lbs/mmscf, ROG with duct burners firing 2.52 lbs/mmscf, ROG without duct burners firing 1.76 lbs/mmscf, SO_x 0.71 lbs/mmscf with and without duct burner firing.

Protocol: The operator shall calculate the emission limit(s) for CO, during the commissioning period, using fuel consumption data and the following emission factor: 68.14 lb/mmscf.

Protocol: The operator shall calculate the emission limit(s) for CO, after the commissioning period and prior to the CO CEMS certification, using fuel consumption data and the following emission factor: 19.95 lbs/mmscf.

Protocol: The operator shall calculate the emission limit(s) for CO, after the CO CEMS certification, based on readings from the certified CEMS. In the event the CO CEMS is not operating or the emissions exceed the valid upper range of the analyzer, the emissions shall be calculated in accordance with the approved CEMS plan.

Verification: The project owner shall submit to the CPM and APCO turbine emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-C9**).

AQ-13 The operator shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):

Protocol: Natural gas fuel use during the commissioning period.

Verification: The project owner shall make the site available for inspection of the commissioning period natural gas usage data by representatives of the District, CARB and the Commission.

AQ-14 The operator shall install and maintain a CEMS to measure the following parameters:

Protocol: CO concentration in ppmv.

Protocol: Concentrations shall be corrected to 15 percent oxygen on a dry basis.

Protocol: The CEMS will convert the actual CO concentrations to mass emission rates (lbs/hr) and record the hourly emission rates on a continuous basis.

Protocol: The CEMS shall be installed and operated, in accordance with an approved AQMD Rule 218 CEMS plan application. The operator shall not install the CEMS prior to receiving initial approval from AQMD.

Protocol: The CEMS shall be installed and operated to measure CO concentration over a 15 minute averaging time period.

Protocol: The CEMS shall be installed and operating no later than 90 days after initial startup of the turbine.

Verification: The project owner shall provide the CPM documentation of the Districts approval of the CEMS, within 15 days of its receipt. The project owner shall

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

AQ-15 The operator shall install and maintain a CEMS to measure the following parameters:

Protocol: NO_x concentration is expressed in ppmv.

Protocol: Concentrations shall be corrected to 15 percent oxygen on a dry basis.

Protocol: The CEMS shall be installed and operating no later than 12 months after initial start-up of the turbine and shall comply with the requirements of Rule 2012. During the interim period between the initial start-up and the provisional certification date of the CEMS, the operator shall comply with the monitoring requirements of Rule 2012(h)(2) and 2012(h)(3). Within two weeks of the turbine startup date, the operator shall provide written notification to the District of the exact date of start-up.

Verification: The project owner shall provide the CPM documentation of the Districts approval of the CEMS, within 15 days of its receipt. The project owner shall make the site available for inspection of the CEMS by representatives of the District, CARB and the Commission.

AQ-16 The 2.5 ppm NO_x emission limit(s) shall not apply during turbine commissioning, startup, and shutdown periods. Startup time shall not exceed 1 hour per startup and the number of startups shall not exceed one per day. Shutdown time shall not exceed 30 minutes per shutdown and the number of shutdowns shall not exceed one per day. The commissioning period shall not exceed 636 operating hours from the date of initial start-up. The operator shall provide the AQMD with written notification of the start-up date. Written records of commissioning, startups, and shutdowns shall be maintained and made available upon request from AQMD.

Verification: The project owner shall submit, commencing one month from the time of gas turbine first fire, a monthly commissioning status report throughout the duration of the commissioning phase that demonstrates compliance with this condition and the emission limits of Condition **AQ-12**. The monthly commissioning status report shall include criteria pollutant emission estimates for each commissioning activity and total commissioning emission estimates. The monthly commissioning status report shall be submitted to the CPM until the report includes the completion of the initial commissioning activities. The project owner shall provide start-up and shutdown occurrence and duration data as part as part of the Quarterly Operation Report (**AQ-C9**). The project owner shall make the site available for inspection of the commissioning and start-up/shutdown records by representatives of the District, CARB and the Commission.

AQ-17 The 6.0 ppm CO emission limit(s) shall not apply during turbine commissioning, startup, and shutdown periods. Startup time shall not exceed 1 hour per startup and the number of startups shall not exceed one per day. Shutdown time shall not exceed 30 minutes per shutdown

and the number of shutdowns shall not exceed one per day. The commissioning period shall not exceed 636 operating hours from the date of initial start-up. The operator shall provide the AQMD with written notification of the initial start-up date. Written records of commissioning, startups, and shutdowns shall be maintained and made available upon request from AQMD.

Verification: See verification of Condition **AQ-16**.

AQ-18 The 88.43 lbs/mmscf NO_x emission limit(s) shall only apply during the interim period to report RECLAIM emissions. The interim period shall not exceed 12 months from the initial startup date.

Verification: The project owner shall submit to the CPM and APCO turbine emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-C9**).

AQ-19 For the purpose of the following condition number(s) continuously record shall be defined as recording at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour.

Condition **AQ-5**

Condition **AQ-6**

Verification: See verifications for Conditions **AQ-5** and **AQ-6**.

AQ-20 For the purpose of the following condition number(s) continuously record shall be defined as recording at least once every hour and shall be calculated based upon the average of the continuous monitoring for that month.

Condition **AQ-7**

Verification: See verification for Condition **AQ-7**.

AQ-21 The 2.5 ppmv NO_x emission limit(s) are averaged over 1 hour at 15 percent oxygen, dry basis.

Verification: The project owner shall submit to the CPM and APCO turbine CEMS emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-C9**).

AQ-22 The 6.0 ppmv CO emission limit(s) are averaged over 3 hours at 15 percent oxygen, dry basis.

Verification: The project owner shall submit to the CPM and APCO turbine CEMS emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-C9**).

AQ-23 The 2.0 ppmv ROG emission limit(s) are averaged over 1 hour at 15 percent oxygen, dry basis.

Verification: The project owner shall submit to the CPM and APCO turbine emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-C9**).

AQ-24 The 5 ppmv NH_3 emissions limit(s) are averaged over 1 hour at 15 percent oxygen, dry basis.

Verification: The project owner shall submit to the CPM and APCO turbine CEMS emissions data demonstrating compliance with this condition as part of the

AQ-25 The operator shall install, operate, and maintain an approved Continuous Emission Monitoring Device, approved by the Executive Officer, to monitor and record ammonia concentrations, and alert the operator (via audible or visible alarm) whenever ammonia concentrations are near, at, or in excess of the permitted ammonia limit of 5 ppmv, corrected to 15% oxygen. It shall continuously monitor, compute, and record the following parameters:

Protocol: Ammonia concentration, uncorrected in ppmv

Protocol: Oxygen concentration in percent

Protocol: Ammonia concentration in ppmv, corrected to 15% oxygen

Protocol: Date, time, extent (in time) of all excursions above 5 ppmv, corrected to 15% oxygen

Protocol: The Continuous Emission Monitoring Device described above shall be operated and maintained according to a Quality Assurance Plan (QAP) approved by the Executive Officer. The QAP must address contingencies for monitored ammonia concentrations near, at, or above the permitted compliance limit, and remedial actions to reduce ammonia levels once an exceedance has occurred.

Protocol: The Continuous Emission Monitoring Device may not be used for compliance determination or emission information determination without corroborative data using an approved reference method for the determination of ammonia.

Protocol: The Continuous Emission Monitoring Device shall be installed and operating no later than 90 days after initial startup of the turbine.

Verification: The project owner shall provide the CPM documentation of the Districts approval of the CEMS, within 15 days of its receipt. The project owner shall make the site available for inspection of the CEMS and CEMS records by representatives of the District, CARB and the Commission.

AQ-26 This equipment shall not be operated unless the operator demonstrates to the Executive Officer that the facility holds sufficient RTCs to offset the prorated annual emissions increase for the first compliance year of operation. In addition, this equipment shall not be operated unless the operator demonstrates to the Executive Officer that, at the commencement of each compliance year after the first compliance year of operation, the facility holds sufficient RTCs in an amount equal to the annual emissions increase.

Verification: The project owner shall submit to the CPM copies of all RECLAIM reports filed with the District demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-C9**).

AQ-27 For the purpose of determining compliance with District Rule 475, combustion contaminant emissions may exceed the concentration limit or the mass emission limit listed, but not both limits at the same time.

Verification: The project owner shall submit to the CPM and APCO turbine CEMS emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-C9**).

Auxiliary Boiler and its SCR unit

AQ-28 The operator shall install and maintain a flow meter to accurately indicate the flow rate of the total hourly throughput of injected ammonia (NH_3).

Protocol: The operator shall also install and maintain a device to continuously record the parameter being measured.

Protocol: The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

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

AQ-29 The operator shall install and maintain a temperature gauge to accurately indicate the temperature in the exhaust at the inlet to the SCR reactor.

Protocol: The operator shall also install and maintain a device to continuously record the parameter being measured.

Protocol: The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

Verification: The project owner shall make the site available for inspection of the temperature gauge on the inlet to the SCR and the continuous temperature records by representatives of the District, CARB and the Commission.

AQ-30 The operator shall install and maintain a pressure gauge to accurately indicate the differential pressure across the SCR catalyst bed in inches water column.

Protocol: The operator shall also install and maintain a device to continuously record the parameter being measured.

Protocol: The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

Verification: The project owner shall make the site available for inspection of the SCR catalyst bed differential pressure gauge and the differential pressure records by representatives of the District, CARB and the Commission.

AQ-31 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
NH_3 emissions	District Method 207.1 and 5.3 or EPA Method 17	1 hour	Outlet of the SCR

Protocol: The test shall be conducted and the results submitted to the District within 60 days after the test date. The AQMD shall be notified of the date and time of the test at least 7 days prior to the test.

Protocol: The test shall be conducted at least quarterly during the first twelve months of operation and at least annually thereafter. The NO_x concentration, as determined by the certified CEMS, shall be simultaneously recorded during the ammonia slip test. If the CEMS is inoperable or not yet certified, a test shall be conducted to determine the NO_x emissions using District Method 100.1 measured over a 60 minute averaging time period.

Protocol: The test shall be conducted to demonstrate compliance with the Rule 1303 concentration limit.

Verification: The project owner shall submit the proposed protocol for the source tests 60 days prior to the proposed source test date to both the District and CPM for approval. The project owner shall notify the District and CPM no later than seven days prior to the proposed source test date and time. The project owner shall submit source test results no later than 45 days following the source test date to both the District and CPM.

AQ-32 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
NO_x emissions	District Method 100.1	1 hour	Outlet of the SCR
CO emissions	District Method 100.1	1 hour	Outlet of the SCR
SO_x emissions	Approved District Method	District Approved Averaging Time	Fuel Sample
ROG emissions	Approved District Method	1 hour	Outlet of the SCR
PM emissions	Approved District Method	District Approved Averaging Time	Outlet of the SCR
NH_3 emissions	District Method 207.1 and 5.3 or EPA Method 17	1 hour	Outlet of the SCR

Protocol: The test shall be conducted after District approval of the source test protocol, but no later than 180 days after initial start-up. The District shall be notified of the date and time of the test at least 10 days prior to the test.

Protocol: The test shall be conducted to determine the oxygen levels in the exhaust. In addition, the tests shall measure the fuel flow rate (CFH), the flue gas flow rate.

Protocol: The test shall be conducted in accordance with a District approved source test protocol. The protocol shall be submitted to the AQMD engineer no later than 45 days before the proposed test date and shall be approved by the District before the test commences. The test protocol shall include the proposed operating conditions of the auxiliary boiler during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

Protocol: The test shall be conducted when this equipment is operating at loads of 100, 75, and 50 percent of maximum load for all pollutants.

Verification: The project owner shall submit the proposed protocol for the initial source tests 45 days prior to the proposed source test date to both the District and 60 days following the source test date to both the District and CPM. The project owner shall notify the District and CPM no later than 10 days prior to the proposed initial source test date and time.

AQ-33 The operator shall provide to the District a source test report in accordance with the following specifications:

Protocol: Source test results shall be submitted to the District no later than 60 days after the source test was conducted.

Protocol: Emission data shall be expressed in terms of concentration (ppmv), corrected to 3 percent oxygen (dry basis), mass rate (lbs/hr), and lbs/MM cubic feet. In addition, solid PM emissions, if required to be tested, shall also be reported in terms of grains per DSCF.

Protocol: All exhaust flow rates shall be expressed in terms of dry standard cubic feet per minute (DSCFM) and dry actual cubic feet per minute (DACFM).

Protocol: All moisture concentration shall be expressed in terms of percent corrected to 3 percent oxygen.

Protocol: Source test results shall also include the oxygen levels in the exhaust, the fuel flow rate (CFH), the flue gas temperature, and the generator power output (MW) under which the test was conducted.

Verification: See verifications for Conditions **AQ-31 and AQ-32**.

AQ-34 The operator shall limit emissions from this equipment as follows:

Contaminant	**Emissions Limit**
CO	3, 330 LBS IN ANY 1 MONTH
PM_{10}	690 LBS IN ANY 1 MONTH
ROG	390 LBS IN ANY 1 MONTH
SO_x	60 LBS IN ANY 1 MONTH

Protocol: The operator shall calculate the emission limit(s) by using monthly fuel use data and the following emission factors: CO 36.25 lb/mmscf, PM_{10} 7.58 lbs/mmscf, ROG 4.14 lbs/mmscf, SO_x 0.70 lbs/mmscf.

Verification: The project owner shall submit to the CPM and APCO turbine emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-C9**).

AQ-35 The operator shall install and maintain a CEMS to measure the following parameters:

Protocol: CO concentration in ppmv.

Protocol: Concentrations shall be corrected to 3 percent oxygen on a dry basis.

Protocol: The CEMS will convert the actual CO concentrations to mass emission rates (lbs/hr) and record the hourly emission rates on a continuous basis.

Protocol: The CEMS shall be installed and operated, in accordance with an approved AQMD Rule 218 CEMS plan application. The operator shall not install the CEMS prior to receiving initial approval from AQMD.

Protocol: The CEMS shall be installed and operated to measure CO concentration over a 15 minute averaging time period.

Protocol: The CEMS shall be installed and operating no later than 90 days after initial startup of the boiler.

Verification: The project owner shall provide the CPM documentation of the Districts approval of the CEMS, within 15 days of its receipt. The project owner shall make the site available for inspection of the CEMS by representatives of the District, CARB and the Commission.

AQ-36 The operator shall install and maintain a CEMS to measure the following parameters:

Protocol: NO_x concentration is expressed in ppmv.

Protocol: Concentrations shall be corrected to 3 percent oxygen on a dry basis.

Protocol: The CEMS shall be installed and operating no later than 12 months after initial start-up of the boiler and shall comply with the requirements of Rule 2012. During the interim period between the initial start-up and the provisional certification date of the CEMS, the operator shall comply with the monitoring requirements of Rule 2012(h)(2) and 2012(h)(3). Within two weeks of the boiler startup date, the operator shall provide written notification to the District of the exact date of start-up.

Verification: The project owner shall provide the CPM documentation of the Districts approval of the CEMS, within 15 days of its receipt. The project owner shall make the site available for inspection of the CEMS by representatives of the District, CARB and the Commission.

AQ-37 The 38.46 LBS/MMSCF NO_x emission limit(s) shall only apply during the interim reporting period to report RECLAIM emissions. The interim reporting period is defined as before the CEMS is certified, and it shall not exceed 12 months from the initial startup date.

Verification: The project owner shall submit to the CPM and APCO turbine emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-C9**).

AQ-38 For the purpose of the following condition number(s) continuously record shall be defined as recording at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour.

Condition **AQ-28**
Condition **AQ-29**

Verification: See verifications for Conditions **AQ-28** and **AQ-29**.

AQ-39 For the purpose of the following condition number(s) continuously record shall be defined as recording at least once every hour and shall be calculated based upon the average of the continuous monitoring for that month.

Condition **AQ-30**

Verification: See verification for Condition **AQ-30**.

AQ-40 The 7 ppmv NO_x emission limit(s) are averaged over one hour at 3 percent oxygen, dry basis.

Verification: The project owner shall submit to the CPM and APCO auxiliary boiler CEMS emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-C9**).

AQ-41 The 50 ppmv CO emission limit(s) are averaged over 1 hour at 3 percent oxygen, dry basis.

Verification: The project owner shall submit to the CPM and APCO auxiliary boiler CEMS emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-C9**).

AQ-42 The operator shall install, operate, and maintain an approved Continuous Emission Monitoring Device, approved by the Executive Officer, to monitor and record ammonia concentrations, and alert the operator (via audible or visible alarm) whenever ammonia concentrations are near, at, or in excess of the permitted ammonia limit of 5 ppmv, corrected to 3% oxygen. It shall continuously monitor, compute, and record the following parameters:

Protocol: Ammonia concentration, uncorrected in ppmv

Protocol: Oxygen concentration in percent

Protocol: Ammonia concentration in ppmv, corrected to 3 percent oxygen

Protocol: Date, time, extent (in time) of all excursions above 5 ppmv, corrected to 3 percent oxygen

Protocol: The Continuous Emission Monitoring Device described above shall be operated and maintained according to a Quality Assurance Plan (QAP) approved by the Executive Officer. The QAP must address contingencies for monitored ammonia concentrations near, at, or above the permitted compliance limit, and remedial actions to reduce ammonia levels once an exceedance has occurred.

Protocol: The Continuous Emission Monitoring Device may not be used for compliance determination or emission information determination without corroborative data using an approved reference method for the determination of ammonia.

Protocol: The Continuous Emission Monitoring Device shall be installed and operating no later than 90 days after initial startup of the boiler.

Verification: The project owner shall provide the CPM documentation of the Districts approval of the CEMS, within 15 days of its receipt. The project owner shall make the site available for inspection of the CEMS and CEMS records by representatives of the District, CARB and the Commission.

AQ-43 This equipment shall not be operated unless the operator demonstrates to the Executive Officer that the facility holds sufficient RTCs to offset the prorated annual emissions increase for the first compliance year of operation. In addition, this equipment shall not be operated unless the operator demonstrates to the Executive Officer that, at the commencement of each compliance year after the first compliance year of operation, the facility holds sufficient RTCs in an amount equal to the annual emissions increase.

Verification: The project owner shall submit to the CPM copies of all RECLAIM reports filed with the District demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-C9**).

Emergency Generator and Fire Pump Engine

AQ-44 The operator shall limit the operating time to no more than 200 hours per year.

Verification: The project owner shall submit to the CPM and APCO the emergency generator and fire pump IC engines operations data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-C9**).

AQ-45 The operator shall install and maintain a non-resetable elapsed time meter to accurately indicate the elapsed operating time of the engine.

Verification: The project owner shall make the emergency generator and fire pump engine available for inspection by representatives of the District, CARB and the Commission upon request.

AQ-46 The operator shall install and maintain a non-resetable elapsed fuel meter to accurately indicate the engine fuel consumption.

Verification: The project owner shall make the emergency generator and fire pump engine available for inspection by representatives of the District, CARB and the Commission upon request.

AQ-47 The operator shall keep records, in a manner approved by the District, for the following parameters or items.

Protocol: Date of operation, the elapsed time, in hours, and the reason for operation.

Protocol: Records shall be kept and maintained on file for a minimum of two years and made available to district personnel upon request.

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

Ammonia Storage Tanks

AQ-48 The operator shall vent this equipment, during filling, only to the vessel from which it is being filled.

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

AQ-49 The operator shall install and maintain a pressure relief valve set at 25 psig.

Verification: The project owner shall make the ammonia tank pressure relief valve and its specifications available for inspection by representatives of the District, CARB and the Commission upon request.

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BIOLOGICAL RESOURCES

Shari Koslowsky and Natasha Nelson

INTRODUCTION

This section of the Preliminary Staff Assessment (PSA) provides the California Energy Commission (Energy Commission) staff's preliminary analysis of potential impacts to terrestrial biological resources from the construction and operation of the Inland Empire Energy Center (IEEC) Project proposed by Inland Empire Energy Center LLC (referred to as applicant). Information provided in this document addresses potential impacts to state and federally listed species, species of special concern, and areas of critical biological concern. This analysis also describes the biological resources of the project site and at the locations of ancillary facilities. This document determines the need for mitigation, the adequacy of mitigation proposed by the applicant, and where necessary, specifies additional mitigation measures to reduce identified impacts to less than significant levels. It also determines compliance with applicable laws, ordinances, regulations and standards (LORS), and recommends conditions of certification.

This analysis is based, in part, upon information provided in the Application for Certification (AFC) for the IEEC Project (Calpine 2001a, AFC Section 5.3 and Appendix J), data adequacy responses (Calpine 2001e), various responses to staff data requests (FWEC 2002c; FWEC 2002e), site visits conducted on October 19 and 30, 2001, and discussions with various agency and applicant representatives.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The applicant is required to abide by the following laws, ordinances, regulations, and standards during project construction and operation.

FEDERAL

Clean Water Act (CWA) of 1977

Title 33, United States Code, sections 1251-1376, and Code of Federal Regulations, part 30, section 330.5(a)(26), prohibit the discharge of dredged or fill material into the waters of the United States without a permit. The administering agency is the U.S. Army Corps of Engineers (USACE). Under the CWA section 404, certain activities resulting in minimal impacts qualify for nationwide permits. In the case of the IEEC, the applicant has submitted an application for Nationwide Permit 12 for utility crossings.

Endangered Species Act (ESA) 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 the protection of threatened and endangered plant and animal species, and their critical habitat. The administering agency is the U.S. Fish and Wildlife Service (USFWS).

Migratory Bird Treaty Act

Title 16, United States Code, sections 703 through 712, prohibit the take of migratory birds, including nests with viable eggs. The administering agency is the USFWS.

STATE

The administering agency for all state LORS below is the California Department of Fish and Game (CDFG), except for the CWA section 401 certification, as discussed in the last item in this section.

California Endangered Species Act (CESA) of 1984

Fish and Game Code sections 2050 through 2098 protect California's rare, threatened, and endangered species.

California Code of Regulations Title 14, Division 1, Subdivision 3, Chapter 3, sections 670.2 and 670.5 list plants and animals of California that are designated as rare, threatened, or endangered.

Fully Protected Species

Fish and Game Code sections 3511, 4700, 5050, and 5515 prohibit the take of animals that are classified as fully protected in California.

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 – Take, Possess, or Destroy

Fish and Game Code section 3503.5 specifically protects California's birds of prey in the orders Falconiformes and Strigiformes by making it unlawful to take, possess, or destroy any such birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

Migratory Birds – Take or Possession

Fish and Game Code section 3513 protects California's migratory non-game birds by making it unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act or any part of such migratory non-game bird.

Significant Natural Areas

Fish and Game Code section 1930 *et seq.* designates certain areas in California such as refuges, natural sloughs, riparian areas and vernal pools as significant wildlife habitat.

Native Plant Protection Act of 1977

Fish and Game Code section 1900 *et seq.* designates rare, threatened, and endangered plants in the state of California.

Streambed Alteration Agreement

Fish and Game Code section 1603 *et seq.* regulates activities by private utilities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California designated by the CDFG in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. The CDFG has indicated in the case of the IEEC site that no streambed alteration agreement is needed (FWEC 2002e; CDFG 2001a).

Regional Water Quality Control Board (RWQCB)

By federal law every applicant for a federal permit or license for an activity which may result in a discharge into a California water body must request state certification that the proposed activity will not violate state and federal water quality standards. The project owner would be required to get a CWA section 401 certification from the Santa Ana Regional Water Quality Control Board (RWQCB). The RWQCB provides its certification after reviewing the federal Nationwide Permit(s) provided by the USACE.

LOCAL

Draft Western Riverside Multiple species Habitat Conservation Plan (Draft MSHCP)

The draft Western Riverside MSHCP is an element of the Riverside County Integrated Project. The draft MSHCP is designed to conserve open space, nature preserves and wildlife areas for over 150 species in western Riverside County. The reserve planning area considers: (1) existing public and quasi-public lands totaling approximately 357,000 acres; (2) criteria areas totaling approximately 153,000 acres that are brought in to the reserve area as important corridors and linkages for the reserve area. Criteria areas are identified by groups of block-shaped areas with common conservation goals. The MSHCP will enable Riverside County to efficiently plan for future land development, while protecting the natural environment. An administrative draft of this document was released in early March 2002. This draft provided a preliminary definition of criteria areas. A public draft is expected in July 2002 (Lovelady 2002; Riverside County 2002a). The project site falls approximately within the center of the planning area covered by the draft MSHCP.

Stephens' Kangaroo Rat Habitat Conservation Plan (HCP)

The Stephens' kangaroo rat HCP is a 30-year plan approved in 1996 that is designed to acquire and permanently set-aside, maintain, manage and fund conservation, preservation, restoration and enhancement of the Stephens' kangaroo rat and its habitat. The HCP establishes suitable habitat areas where incidental take is permitted through a fee process and core reserve areas in occupied habitat where individual permits are required. The HCP and the creation of a designated fee area establishes a regional mechanism in western Riverside County through which otherwise lawful activities resulting in the incidental take of Stephens' kangaroo rat meet ESA and CESA requirements without the need to secure individual permits and agreements from the USFWS and the CDFG. All of the IEEC project features are located within the Stephens' kangaroo rat HCP fee area (Riverside County Habitat Conservation Agency, 1996).

Riverside County Ordinance No. 663.10, Stephens' Kangaroo Rat Mitigation Fee Ordinance

The ordinance establishes a Plan Fee Assessment Area and sets mitigation fees for development permits in areas covered by the Stephens' Kangaroo Rat Habitat Conservation Plan. Prior to issuance of a grading permit, the IEEC shall comply with the provisions of this ordinance, which generally requires the payment of the appropriate fee set forth in that ordinance. The amount of the fee to be paid may vary depending on the type of development application submitted and the applicability of any

fee reduction or exemption provisions contained in the ordinance. However, generally all applicants who cannot satisfy mitigation through onsite measures shall pay a fee of $500.00 per gross acre of the parcels proposed for development. Said fee shall be calculated based on the approved development project (Riverside 2002a).

Riverside County Comprehensive General Plan – Environmental Hazards and Resources Element

This Plan contains general policies regarding the protection and preservation of habitat and sensitive plant and wildlife species. Some of the more relevant elements of those policies include:

- Detailed biological reports, including inventories, impact assessment and mitigation shall be prepared and submitted;
- Disruption of sensitive vegetation shall be kept to a minimum, and adequate measures to protect vegetative species shall be taken;
- Where possible, landscaping shall be accomplished through the use of vegetation native to the project site;
- Adequate provision shall be made for the retention of existing trees and other flora; and
- Where necessary, immediate planting shall be planned and implemented.

Riverside County Ordinance 546.15, Fire Protection

Cleared zones are established beneath transmission lines and the areas around poles or towers. This ordinance would provide guidance in determining the affected area within and adjacent to the transmission line, as well as place constraints on any revegetation required within the project area.

Riverside County Ordinance 655, Light Pollution

This ordinance restricts the permitted use of certain light fixtures emitting into the night sky undesirable light rays. Although the intent is to reduce detrimental effects on astronomical observation and research, this ordinance would provide guidance that is relevant to the reduction of light pollution for wildlife and plants (e.g., use of low-pressure sodium lamps and shielding).

Riverside County Ordinance No. 695.1, Abatement of Hazardous Vegetation

This ordinance requires that all dry grass, Russian thistle (tumbleweed), or other flammable vegetation that constitutes a fire hazard that may endanger or damage neighboring property must be abated. As such, it identifies potential constraints to revegetation or landscaping that may be required.

Riverside County Ordinance No. 810, Establishing an Interim Open Space Mitigation Fee

The ordinance establishes and sets forth policies, regulations, and a fee to fund the acquisition of open space and preservation of habitat for wildlife necessary to mitigate the direct and cumulative environmental effects generated by new development projects described and defined in this ordinance. Fees are established for projects in residential, commercial and industrial areas that fall within the fee area boundaries. The amount of

the fee shall be calculated on the basis of "Project Area", which shall mean the area, measured in acres, from the adjacent road right-of-way to the limit of the project development.

Riverside County Land Use Conformity Analysis, Local Laws, Ordinances, Regulations and Standards

Riverside County (Riverside 2002a) provided this analysis to identify conditions that the County would impose if they were the authorizing agency. The conditions indirectly or directly related to biological resources are listed below.

- 10. General Conditions. Planning. 15 Use – Landscape Species. Drought tolerant and native plant species shall be preferred over non-drought tolerant and non-native species. However, the quantity and extent of those species shall depend on the project's climatic zone. Alternative types of low volume irrigation are encouraged to be used in order to conserve water.
- 10. General Conditions. Planning. 25 Use – Viable Landscaping. All plant materials within landscaped areas shall be maintained in a viable growth condition throughout the life of this permit.
- 10. General Conditions. Planning. 36 Use – Ord. 810 Open Space Fee (see County Ordinance 810 above).
- 30. Prior to Any Project Approval. BS Grade. 15 SP – Plant and Irrigate Slopes. Plant and irrigate all slopes greater than or equal to 3' in vertical height with grass or ground cover. Slopes that exceed 15' in vertical height are to be provided with shrubs and/or trees per county ordinance 457.
- 60. Prior to Grading Permit Issuance. Planning. 7 Use – Stephens' kangaroo rat Fee Condition (see County Ordinance 663 above).

SETTING

REGIONAL AND LOCAL

The proposed project site and linear facility routes would be located in Perris Valley, in western Riverside County, approximately two miles northeast of Sun City and immediately southeast of Romoland. The Perris Valley has a Mediterranean climate influenced by the Pacific Ocean and is characterized by hot, dry summers and mild, wet winters. Temperatures average in the mid to upper 60s during the winter months and from the high 80s to the low to mid 90s during the summer months. Average precipitation is 12 inches per year of which the majority falls between November and March. Wind is predominantly from the west and northwest more than half the time from April through September. From October through March winds are more variable and can originate from the north to the east-southeast at least one-third of the time, from the west and northwest for approximately one-third of the time, and variable throughout the remainder (Calpine 2001a, Appendix K).

The project site is located on flat terrain aligned with the NNW-SSE orientation of Perris Valley. Beyond the immediate site, the area is bordered a few miles in the distance by

low hills and foothills: to the northeast by Lakeview Mountains; to the east by Double Buttes; to the south near Sun City; and further to the west by Steele Peak.

Currently the area is classified as disturbed and agricultural land. The nearest residences are located several hundred feet to the north and southwest; planned development ensures that surrounding residential land use will replace the dominant agricultural use. Prior to development, the valley likely supported native-grassland (largely replaced by non-native annual grasslands), riparian scrub, meadow, wetland and some species typical of coastal sage scrub vegetation. Based on vegetation mapping completed for the draft Western Riverside MSHCP, this area is among the most highly disturbed; fragments of native vegetation remain only in the foothill and mountainous regions where slopes are too steep for development purposes.

Existing Vegetation and Wildlife

The applicant completed a survey of flora and fauna in the project area. The list of observed plant species consisted primarily of a mixture of native and non-native herbaceous species commonly found in disturbed areas, fallow fields, meadows and wetlands. Mulefat (*Baccharis salicifolia*), a common riparian species is also present along drainages at the site (Calpine 2001a, Tables 5.3-3 and 5.3-6).

Because the land surface in the project area is subject to regular disturbance from agricultural activities, wildlife habitat resources are limited. There is little or no cover or suitable nesting habitat above one foot from the surface; however there is foraging habitat. The list of observed wildlife included a variety of common songbirds and raptors. In addition, a few species of toads, frogs, snakes and lizards, ground squirrel, rabbit, coyote and skunk are present in the area (Calpine 2001a, Table 5.3-8).

Special Status Species

Although the area around the project site has been highly modified, several special status plant and animal species are known to historically occur within one mile of the project area, or were specifically identified in USFWS and CDFG correspondence as likely to occur within the project area. A list of these species is presented in **Biological Resources Table 1**. The USFWS and CDFG in their correspondence (USFWS 2001a; USFWS 2001b; CDFG 2001a) specifically identified concerns regarding the project's presence within Stephens' kangaroo rat and San Bernardino kangaroo rat habitat; the San Jacinto valley crownscale and thread-leaved brodiaea documented approximately one mile southwest of the proposed project site (i.e., east of I-215 and south of Ethanac Road); and coastal California gnatcatcher documented approximately 1.5 miles south and southwest of the site. Swainson's hawk, golden eagle and fairy shrimp were also cited in this correspondence.

The applicant completed wildlife surveys during 2001 to assess the potential presence of occupied, or suitable but unoccupied habitat for bald and golden eagles, southwestern willow flycatcher, least Bell's vireo, quino checkerspot butterfly, arroyo southwestern toad, western spadefoot toad, Stephens' kangaroo rat and San Bernardino kangaroo rat. None of these species, including the other plant and animal species listed in **Biological Resources Table 1**, were observed during the survey period completed from April to June 2001 (Calpine 2001a, pages 5.3-15 to 5.3-19). One exception to this conclusion is the potential presence of vernal pool fairy shrimp.

Biological Resources Table 1
Sensitive Species Known to Occur in the Project Vicinity
(CALPINE 2001a, Tables 5.3-1 and 5.3-2)

Sensitive Plants	Status** (Federal, State, CNPS)
Atriplex coronata var. *notatior* (San Jacinto Valley crownscale)*	--,CE,1B
Atriplex pacifica (south coast saltscale)	FSC,--,1B
Atriplex parishii (Parish's brittlescale)	FSC,--,1B
Brodiaea filifolia (thread-leaved brodiaea)*	FE,CT,1B
Chorizanthe parryi var. *parryi* (Parry's spineflower)	--,--,3
Dodecahema leptoceras (slender-horned spineflower)*	FE,CE,1B
Hemizonia pungens var. *laevis* (smooth tarplant)	--,CSC,1B
Lasthenia glabrata coulteri (Coulter's goldfields)	--,CSC,1B
Navarretia fossalis (spreading navarretia)*	--,CE,1B
Orcuttia californica (California orcutt grass)*	FE,CE,1B
Trichoronis wrightii var. *wrightii* (Wright's trichocoronis)	--,--,2

Sensitive Wildlife	Status (Federal, State)
Birds	
Haliaeetus leucocephalus (bald eagle)*	FT,CE
Aquila chrysaetos (golden eagle)*	--,CSC
Polioptila californica (coastal California gnatcatcher)*	FT,CSC
Empidonax traillii extimus (southwestern willow flycatcher)*	FE,--
Vireo bellii pusillus (least Bell's vireo)	FE,CE
Athene cunicularia (burrowing owl)	--,CSC
Buteo swainsoni (Swainson's hawk)*	--,CT
Invertebrates	
Branchinecta lynchi (vernal pool fairy shrimp)*	FT,--
Euphydryas editha quino (Quino checkerspot butterfly)*	FE,--
Mammals	
Dipodomys stephensi (Stephens' kangaroo rat)*	FE,CT
Dipodomys merriami parvus (San Bernardino kangaroo rat)*	FE,CSC
Reptiles and Amphibians	
Scaphiopus hammondi (western spadefoot toad)	FSC,CSC
Cnemidophorus hyperythrus (orange throated whiptail)	FSC,CSC
Bufo microscaphus californicus (arroyo southwestern toad)	FE,CSC

* - Species also identified in USFWS and CDFG correspondence (USFWS 2001a; USFWS 2001b; and CDFG 2001a).
** - **Status Legend: FE**: Federally Endangered; **FT**: Federally Threatened; **FSC**: Federal Species of Concern; **FPE**: Federal Proposed Endangered; **FPT**: Federal Proposed Threatened; **FC**: Federal Candidate for Listing; **CE**: California Endangered; **CT**: California Threatened; **CPE**: California Proposed Endangered; **CSC**: California Species of Special Concern; **CFP**: California Fully-protected Species; **CR**: California Rare; California Native Plant Society (CNPS) **CNPS List 1A**: Presumed Extinct; **CNPS List 1B**: Rare or endangered in California and elsewhere; **CNPS List 2**: Plants rare, threatened or endangered in California but more common elsewhere; **CNPS List 3**: Plants about which we need more information – a review list.

Dry season analyses of fairy shrimp cysts (eggs) were inconclusive (see Impacts and Analysis below). A wet season survey undertaken by the applicant was finished in

June 2002. The result of the survey is still pending submittal by the applicant. The survey result should have been submitted within ten working days of the last survey date (FWEC 2002e, Data Responses 162 and 163) and were requested again from the applicant on July 9, 2002 (CEC 2002m).

Specifically, the site assessment and focused survey for Stephens' kangaroo rat and San Bernardino kangaroo rat, completed by a permitted biologist, indicated no habitat or sign of the species in the project area (Calpine 2001a, page 5.3-24).

Although the project area potentially provides foraging habitat for raptors, the lack of trees, land disturbance and lack of microtopographic relief and ground cover for prey limit such opportunities. Consistent with this observation, the applicant's biological report indicates burrowing owls were not observed in the project area, nor were any burrows observed (Calpine 2001a, page 5.3-25). For some of the same reasons cited for a lack of prey (e.g., disturbance, lack of ground cover and relief), suitable burrow sites are also limited.

Sensitive Habitats

Wetlands

The applicant completed a wetlands delineation of the project area to identify the presence of jurisdictional bed and bank features, wetlands and waters of the U.S. The delineation identified six potential areas, as well as drainage features within the project area, all of which lie within the FEMA 100-year flood plain of the San Jacinto River (FEMA 1996). After careful assessment of the characteristics of these potential wetland areas, it was concluded that none of the six areas presented hydric soils and therefore, were not jurisdictional wetlands (FWEC 2002e, Data Response 165). Moreover, the project area is underlain by moderately to well weathered alluvial soils and does not support the fine textured clay, saline or alkaline soils indicative of the San Jacinto vernal pools or alkali playas; these soils and associated vegetation are found to the north of the project area. The applicant has determined however, that the bed and bank features do meet the requirements for jurisdictional waters (FWEC 2002e, Data Reponse 165). The impact section of this assessment discusses project effects on these features.

Coastal Sage Scrub and Chaparral

The coastal sage scrub and chaparral ecoregion is located along the southern California coast, terraces, plains and foothills characterized by Mediterranean climate. It has extremely high levels of species diversity and endemism, particularly adapted to occasional fires and drought. Coastal sage scrub, chamise chaparral and oak woodlands are the dominant vegetation types in this region. Chamise chaparral generally occurs in higher elevations than coastal sage scrub, which has higher growth during the cool rainy season. Much of this vegetation has been lost to agricultural and urban development. The protection of coastal sage scrub has been the focus of the Natural Communities Conservation Planning program, under the act of the same name, because it provides habitat to many special status species. As far as the vegetation itself, the CDFG only recognizes some scrub and chaparral associations or series as rare. Within the project area, the draft MSHCP (Riverside County 2002a) identifies

coastal sage scrub and chaparral as scattered fragments primarily located in elevated areas identified as mountainous/rural land use, generally unsuitable for agricultural or urban development (e.g., Double Buttes to the east of the project area). The vegetation mapping in the draft MSHCP is not of sufficient detail to determine if any this area supports the rare vegetation associations or series cited as rare by the CDFG.

Sensitive Wilderness Areas

Certain national parks and wilderness areas are given special protection under the visibility program and for air impacts from new sources under the Clean Air Act and are referred to as Class I areas. The following Class I wilderness areas; their relative location and distance from the project site are provided in **Biological Resources Table 2**.

Biological Resources Table 2
Summary of Class 1 Wilderness Areas

Name	Distance	Direction
Agua Tibia Wilderness Area	20.1	SSE
Cucamonga Wilderness Area	38.7	NNW
Joshua Tree National Park	42.3	ENE
San Gabriel Wilderness Area	51.6	NW
San Gorgonio Wilderness Area	27.6	NNE
San Jacinto Wilderness Area	25.8	E

PROJECT SITE

Power Plant Site and Construction Laydown Area

The proposed IEEC project site is located on a 46-acre parcel in an unincorporated area of western Riverside County. Historically the IEEC site has been used to grow field crops, but the field is currently fallow. The site is bordered on the west by Antelope Road, on the south by McLaughlin Road, on the east by San Jacinto Road, and on the northeast by fields, an asphalt plant and the Burlington Northern and Santa Fe (BNSF) railway, the latter of which also transects the proposed transmission line. The site will be accessed during construction and operation from SR 74, to Ethanac Road (2-lane, east-west road) and then south along Antelope Road (two lane rural road) to the main project entrance (see Antelope Road improvements below). During peak construction there will be approximately 326 worker round trips and 40 delivery truck round trips per day along this route (Calpine 2001a, Table 5.11-5). The immediately surrounding area is still predominantly agriculture, however residential construction is replacing some of this land use.

Biological Resources Table 3 summarizes temporary and permanent disturbance within the project footprint for the plant site and other features discussed in the following text.

Biological Resources Table 3
Summary of Affected Acreage
(CALPINE 2001a, Table 3.7-4)

Feature	Area Affected during Project Construction	
	Temporary	**Permanent**
Plant and construction laydown area	11 acres	35 acres
Antelope road improvements*	0 acres	0.9 acres
500 kV transmission line	1.6 acres	0.1 acres
Relocation of existing 115 kV transmission line	Underground option: 0.03 acres Above ground option: included in gas pipeline temporary impacts	Underground option: 0 acres Above ground option: 50 ft^2
Natural gas pipeline	8.2 acres	0 acres
Compressor substation	4.0 acres	2.6 acres
Non-reclaimable wastewater pipeline	11.3 acres	0 acres
TOTAL	36.13 acres	38.6 acres

*Affected area not provided in the AFC, based on staff estimates.

The project site, excluding linear facilities, will disturb approximately 35 acres for permanent facilities and up to 11 acres for the construction laydown areas to the north and south within the 46-acre parcel (Calpine 2001a, Table 3.7-4). Natural drainage is generally towards the southwest, bearing more westerly at the northern end of the property. There are natural drainage features along the northern and western sides of the parcel and an intermittent feature south of the project site approximately parallel to McLaughlin Road. All drainage from and around the site will be directed towards a detention basin and then an outlet at the southwest corner of the property where it will flow into the existing flood control channel (FWEC 2002c, Date Response 124).

All the plant buildings are single story and pre-engineered. The two HRSGs will be provided with one 195-foot tall stack each (Calpine 2001a, page 3-41). The site will be surrounded by a chain link security fence that will also enclose the power block, switchyard, and other areas requiring controlled access. The perimeter of the site will be landscaped with vegetation and there will be some minor landscaping in the interior of the property. Topsoil will be stockpiled during construction to be reused for this purpose.

Linear Facilities

In addition to the power plant site there will also be several linear facilities as described in the following text.

Antelope Road Improvements

A new 32-foot wide, approximately 3,300-foot long paved road will access the power plant. Antelope Road is currently unimproved and approximately 20 feet wide. The road will be upgraded by the applicant from Ethanac Road to the southern edge of the property, approximately 300 feet north of McLaughlin Road. The access road into the plant is included within the facility parcel. Improvements to Antelope Road would permanently impact 0.9 acres for the road width expansion, curb, sidewalk and landscaping (estimated from Calpine 2001a, page 3-42). The road improvements would affect disturbed agricultural land, and disturbed non-agricultural vegetation.

Transmission Line

The project proposes an above-ground 500 kV transmission line to interconnect with SCE's transmission system. The proposed transmission line will extend approximately 0.9 miles exiting south from the on-site switchyard, then east parallel to McLaughlin Road to the BNSF railroad and then northeast to the SCE Valley substation traversing the BNSF railroad. There will be approximately five towers, each requiring a construction disturbance of 10,000 sq. ft and two pull sites disturbing 20,000 sq. ft; thereafter, each tower will permanently disturb approximately 400 sq. ft per structure. During construction the alignment can be directly accessed along McLaughlin Road almost to the intersection with the BNSF railroad. The segment from BNSF to the substation would be indirectly accessed via Palomar Road and Menifee Road crossing agricultural or disturbed areas to get to the alignment. Temporary construction disturbance is therefore, estimated at 1.6 acres and permanent disturbance estimated at 0.1 acre (Calpine 2001a, Table 3.7-4). The transmission lines and tower will potentially occupy and/or traverse disturbed agricultural land, disturbed non-agricultural vegetation, jurisdictional bed and bank features, and potential fairy shrimp habitat.

Installation of the 500 kV transmission line would require relocation of the existing 115 kV line. SCE is currently considering two alternatives: (1) an underground route adjacent to the north side of McLaughlin road with a construction width of 75 feet; or (2) an above-ground route to the south of McLaughlin road following the gas pipeline right of way (FWEC 2002e, Data Response 165).

Natural Gas Supply Pipeline

An underground natural gas pipeline tie-in will connect to an existing transmission pipeline. The 20-inch line will extend 0.8 miles east along McLaughlin Road, turning south at the railroad to a compressor station and then to the existing line at Menifee Road. Construction disturbance will be 75 feet wide and the permanent easement will occupy a 30-50 foot width. Temporary construction disturbance is estimated at 8.2 acres; the entire disturbed surface will be restored, eliminating any permanent disturbances (Calpine 2001a, Table 3.7-4). From the plant entrance to its connection with the existing line, the gas pipeline will potentially occupy the existing roadway, disturbed agricultural land, disturbed non-agricultural vegetation, jurisdictional bed and bank features, and potential fairy shrimp habitat.

Compressor Station

The compressor station for the natural gas pipeline will require temporary disturbance of 4.0 acres for topsoil storage, parking and the construction office. It will permanently occupy 2.6 acres (Calpine 2001a, Table 3.7-4) of a 6.7-acre parcel. The compressor station is unmanned and operates with safety features required by Department of Transportation codes. Major piping, with few exceptions, is underground and most facilities are within three to five feet from grade (Calpine 2001a, page 3-62). The station will likely be accessed from Menifee Road. Security fencing will prevent direct access. Southern California Edison (SCE) will operate the electrical connection for the compressor station and is currently considering either a 33kV or 4,160V interconnection. The location of electrical connection features has not yet been determined by SCE and will be finalized approximately 2 months after the request for service is submitted, i.e. approximately 5 months before construction of the IEEC plant (FWEC 2002e, Data Response 171). The compressor station would occupy disturbed agricultural land.

Non-reclaimable Wastewater Pipeline

A 12 to 18-inch pipeline will conduct non-reclaimable wastewater from the main facility for 4.7 miles west along McLaughlin Road (2.0 miles along unimproved road right-of-way) and then south along Murrieta Road (2.7 miles along paved road) to EMWD's existing system. Construction will occupy a 20-foot width along this length causing a temporary disturbance of 11.3 acres (Calpine 2001a, Table 3.7-4). The entire disturbed surface will be restored with pavement or vegetation and therefore, there will be no permanent disturbance. The wastewater pipeline will occupy paved road, unimproved road, and disturbed non-agricultural vegetation. Where the pipeline exits the power plant facility it will cross disturbed non-agricultural land.

IMPACTS AND ANALYSIS

STAFF'S CRITERIA FOR DETERMINING IMPACT SIGNIFICANCE

The California Environmental Quality Act (CEQA) Guidelines define direct impacts as those impacts that result from the project and occur at the same time and place. Indirect impacts are caused by the project, but can occur later in time or farther removed in distance, but are still reasonably foreseeable and related to the project. The potential impacts discussed below are those most likely to be associated with construction and operation of the project.

CEQA guidelines provide an environmental checklist to assist lead agencies in their analysis of project impacts. The headings for discussion of impacts presented in this section follow the items in that checklist, as well as items found in the Warren-Alquist act and recent presidential (executive) orders. Significance is generally determined by compliance with applicable LORS; however, because of the diversity of biological impacts, guidelines adopted by resource agencies may also be used. These are appropriately cited in the text.

DIRECT AND INDIRECT IMPACTS

Effect on Sensitive Species

Power Plant and Construction Laydown Area

The power plant and construction laydown area result in the permanent loss of 35 acres and the temporary loss of 11 acres of agricultural habitat. The site is located within historic Stephens' kangaroo rat habitat, but 2001 focused surveys completed by the applicant showed no evidence of habitat or occupation by the species (Calpine 2001a, page 5.3-24). Because the project is located in the fee area of the Stephens' kangaroo rat HCP area, it is presumed to have a significant impact on the species regardless of whether occupied or suitable habitat is present. This requires mitigation through onsite measures such as preservation or addition of lands, or payment of mitigation fees to comply with the County's fee ordinance and measures identified through consultation with USFWS pursuant to the ESA.

The USFWS (USFWS 2001a; USFWS 2002b) has stated that if the lead agency (in this case the USACE) complies with the existing regional incidental take permit (Stephens' kangaroo rat HCP), then impacts to the species can be resolved during the Section 7 consultation process with the lead federal agency[1]. Presently, it is not anticipated that a Section 7 permit will be needed (CEC 2002l). However, in the eventuality that the USFWS determines that a permit is necessary, the applicant has prepared and distributed a draft Biological Assessment which includes Stephens' kangaroo rat to the USACE and USFWS (FWEC 2002e, Data Response 172; CEC 2002g; CEC 2002l). The measures identified in the Biological Opinion (if the Section 7 permit becomes necessary) would be similar to those established under the existing Section 10 permit given to the County. Similarly CDFG (2001a) and Riverside County (2001a) have also registered approval that compliance with the County's HCP will reasonably address impacts to this species. Under Condition of Certification **BIO-12,** the applicant is required to pay fees determined by the Habitat Conservation Agency for temporary and permanent disturbance, as specified in the County's Stephens' kangaroo rat fee ordinance 663.10. The applicant is also required to comply with the terms and conditions of the Biological Opinion, if necessary, or the results of consultation (Condition of Certification **BIO-8)**.

The applicant and staff have proposed mitigation measures, including: the hiring of a Designated Biologist to perform pre-activity plant and wildlife surveys for the sensitive species identified in **Biological Resources Table 1**, including Stephens' kangaroo rat; a worker environmental awareness training program; and additional avoidance measures addressed in Conditions of Certification **BIO-1** through **BIO-6**. With these proposed mitigation measures, impacts to Stephens' kangaroo rat and other sensitive species that may occur in the power plant and construction laydown areas will be less than significant.

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[1] Based on the Biological Assessment submitted by the lead federal agency, the USFWS can determine if Formal Consultation is required. If the Biological Assessment concludes the proposed project is "not likely to adversely affect" or has "no effect" on listed or candidate species, the Service can issue a concurrence under Informal Consultation. If Formal Consultation is required, a Biological Opinion (Section 7 permit) will be issued from the Service.

There are no wetlands located within this area that may potentially support vernal pool fairy shrimp. Therefore, the plant and construction laydown areas will not impact this species.

Linear Facilities, Compressor Station and Construction Laydown Area for the Compressor Station

The linear facilities and compressor station will result in the permanent loss of 3.6 acres and temporary loss 25.13 acres of agricultural and ruderal habitat. This entire area is part of Stephens' kangaroo rat historic habitat and the HCP fee assessment area. Therefore, construction is presumed to have a significant impact on the species. For the same reasons stated above for the plant site and construction laydown areas, this impact will be less than significant with proposed mitigation addressed in Conditions of Certification **BIO-1** through **BIO-12**.

Potential impacts to occupied or suitable vernal pool fairy shrimp habitat cannot be determined at this time. The applicant has submitted the results of dry season surveys completed from July 8, 2001, through September 15, 2001, which indicated fairy shrimp cysts at two sites. Several cysts found at the site were not identifiable to species, and one cyst had characteristics consistent with vernal pool fairy shrimp. Dry season surveys do not provide conclusive determination of absence of the species; complete surveys also include wet season surveys (USFWS 2001b and USFWS 2002b). The wet season survey, although negative to date (FWECe 2002, Data Response 163), has also been limited by low precipitation and lack of sufficient inundation to provide suitable sampling days. The survey season was extended to June 1 to take advantage of any possible inundation events. Staff and USFWS will evaluate results of the survey and staff will suggest mitigation (as needed) within its Final Staff Assessment and USFWS may issue terms and conditions in its consultation response. In anticipation of a conclusion to the analysis, the applicant has already proposed potential mitigation measures (see Mitigation section) that have been incorporated into Condition of Certification **BIO-11** (FWEC 2002e, Data Response 172).

Effect on Sensitive Habitat

Nitrogen Deposition Effects on Class I Wilderness Areas

Staff addressed the potential for dry and wet deposition of nitrogen (N) to affect the sensitive environment of Class I wilderness areas relatively distant from the IEEC site.

The mountains of southern California receive some of the highest rates of atmospheric nitrogen deposition in the world (as much as 40 kg N/ha/yr) and these high deposition rates extend throughout the Los Angeles Basin into Riverside and San Bernardino Counties. The high rates of nitrogen deposition may contribute indirectly to the decline of coastal sage scrub in Riverside and San Bernardino Counties by encouraging the replacement of the native vegetation with invasive grasses that out compete seedlings of native shrubs (Allen 2002; Allen et al. 1998). Adverse effects in addition to invasion of non-native species, including decreased plant function due to leached nutrients (e.g., calcium) from the soil; loss of fine root biomass; decreases in symbiotic mycorrhizal fungi (Egerton-Warburton and Allen 2000); and leaching into surface waters and ground waters, which increases acidification.

The applicant's modeled total sulfur and nitrogen deposition in Class I wilderness areas are provided in columns two and three of **Biological Resources Table 4** for project emissions as they are currently proposed using Best Available Control Technology (BACT) (see Air Quality Section). The fourth column provides cumulative emissions from other projects that have applied for air quality permits in the same region during the last year (i.e., sources that would not have been captured in the ambient assessment and that would be built within the foreseeable future). The methodology for deriving these values tends towards overestimation of rates because: (1) it presumes that all N is converted to depositional forms; and (2) the wet deposition rate was estimated to be equal to the dry deposition rate. In most cases in Southern California wet deposition is less than dry deposition; and significantly less in areas such as this that receive relatively low amounts of rainfall during a few months of the year. It also does not take into account the applicant's mitigation efforts to offset these emissions within the air basin (see Air Quality Section).

Biological Resources Table 4
Maximum Modeled Sulfur and Nitrogen Deposition Rates in Class I Wilderness Areas without Mitigation by Emission Reduction Credits

Class I Wilderness Area	Total S Deposition Plant Only (kg/ha-yr)[1]	Total Dry Nitrogen Deposition Plant Only (kg/ha-yr)[2]	Total Nitrogen Deposition Plant Only (kg/ha-yr)[2,3]	Cumulative Nitrogen Deposition (kg/ha-yr)[4]
Agua Tibia	0.00056	0.01730	0.03461	0.00004
Cucamonga	0.00001	0.00852	0.01704	0.00057
Joshua Tree	0.00013	0.00750	0.01500	0.00229
San Gabriel	0.00000	0.00570	0.01140	0.01328
San Gorgonio	0.00004	0.01258	0.02517	0.03730
San Jacinto	0.00019	0.01354	0.02709	0.00864

1. CALPINE 2001a, Table 5.3-11
2. CALPINE 2001a, Table K.6-7 . These values differ from the total deposition rates provided in Table 5.3-11 of the AFC; and therefore, the higher numbers were used.
3. Total Nitrogen deposition was obtained by doubling dry deposition rates. In reality wet deposition in this region is significantly less than dry deposition due to the lack of rainfall.
4. FWEC 2002c, Data Response 38

The USFS, USFWS and National Park Service (NPS) significance levels are provided in **Biological Resources Table 5**. Values in this table were derived to comply with provisions of the Clean Air Act of 1977 relevant to Class I wilderness areas in California. Injury in this case is defined broadly at the ecosystem level to collectively include processes such as plant metabolism and deposition effects on vegetation structure and diversity. All of these values are at the level of guidance produced to support air quality decisions made by Federal Land Managers.

In no case was the USFS significance threshold exceeded as a result of the power plant emissions alone. The sulfur Deposition Analysis Threshold (DAT) was not exceeded at any of the Class I wilderness areas and therefore, was not considered further in the staff assessment. The deposition rates associated with emissions from the plant exceed the nitrogen DAT at the Joshua Tree National Park (**Biological Resources Tables 4 and**

5). The nitrogen DAT was exceeded at all USFS wilderness areas (**Biological Resources Table 4**). Although the USFS has not formally adopted the DATs, they are not inclined to disagree with their application to Forest Service wilderness areas (McCorison 2002).

Biological Resources Table 5
Significance Criteria Used by the USFS, NPS and USFWS for Evaluating Air Quality Impacts

Description of Criteria	Nitrogen Deposition (kg/ha-yr)	Sulfur Deposition (kg/ha-yr)
USFS significance levels for potential injury in forested ecosystems in the U.S. (Fox et al. 1988).	No significant effect expected: 3-10 Significant effect expected: 10-15	No significant effect expected: 3-7 Significant effect expected: >20
USFS significance levels for potential injury in Southern California (Peterson et al. 1992).[1]	Hardwood forests: >5 Conifer forests: >3 Shrub vegetation: >3 Herbaceous vegetation: >3	All vegetation types: > 5
Deposition analysis thresholds (DAT) used by NPS and USFWS to trigger a management concern for deposition from a single source (NPS 2002).[2]	0.005	0.005

1. The values for nitrogen deposition published by Peterson and others (1992) are somewhat lower than the screening range of 3-10 kg-N/ha-yr published by Fox and others (1988). The latter value however, represents a range for all the areas studied throughout the U.S.

2. The NPS and the USFWS have developed deposition analysis thresholds (DAT) as guidance for evaluating the contribution of additional nitrogen and sulfur deposition within Class I areas from a single source (NPS 2002). The DAT triggers a management concern, and does not necessarily confirm an adverse impact to the environment. Adverse impact determinations will be considered on a case-by-case basis for modeled deposition values that are higher than the DAT. The magnitude of the deposition that an individual source would contribute, as well as the sensitivity of the ecosystem must be considered (NPS 2002). Although these values have not been officially adopted by the USFS, they are considered as reasonable thresholds for application to Class I wilderness areas (McCorison 2002). These values represent the Western DAT for areas located west of the Mississippi River.

Representatives of Federal Land Managers for these Class I wilderness areas have expressed their interest in reviewing the air quality analysis, especially from a cumulative impacts standpoint (see Cumulative Impacts below) and so were provided with copies of the AFC, data responses and this staff assessment. The interest exists because all the Class I wilderness areas are located in a non-attainment area where air quality is not improving, especially due to encroachment of urban areas, and more recently, increased emissions from stationary sources. Among other things, there is a concern that increased success of grasses over native species, partly induced by increased nitrogen deposition, has not only altered habitat characteristics, but also increased fire hazards (Holbeck 2002; McCorison 2002). A review of potential impacts from the proposed power plant and the effectiveness of mitigation is expected from NPS and USFS representatives prior to staff's Final Staff Assessment.

As the DAT guideline points out, it is important to look at the relative contribution of the plant emissions to existing conditions. The applicant estimated a background nitrogen

deposition rate of 7.55 kg-N/ha-yr at Joshua Tree National Park in the AFC (CALPINE 2001a, Appendix K.6), but also estimated lower rates in a subsequent Data Response (FWEC 2002c, Data Response 39). This is within the range where no significant effect is expected to occur in forest ecosystems identified by Fox and others (1988), but slightly higher than the criteria of 3 to 5 kg-N/ha-yr identified by Peterson and others (1992) as potentially having an effect on several vegetation types. The higher background rate is likely an overestimate because the applicant chose to use the rate for dry deposition and doubled it to arrive a total background deposition, despite the fact that the contribution from wet deposition should be considerably less. Under the circumstances the estimated IEEC nitrogen deposition rate at Joshua Tree represents approximately 0.2% of the estimated background in an area that is not likely to be significantly affected by current ambient nitrogen deposition rates.

Approximately ten years ago, nitrogen deposition rates in the Agua Tibia and San Jacinto wilderness areas were estimated to range from 2.9-4.8 and 5-15 kg-N/ha-yr, respectively (Peterson et al. 1992). Agua Tibia and San Jacinto would receive the highest deposition rates from the power plant and deposition levels already exceed the USFS criteria of 3 kg-N/ha-yr (CALPINE 2001a, Table 5.3-11; Peterson et al. 1992). The IEEC emission contributions would be approximately 0.9% and 0.3%, respectively of the estimated background rates at the two sites. Overall, the estimated IEEC nitrogen deposition rates at these two sites are not likely to significantly affect current ambient nitrogen deposition rates, and all project related impacts would be mitigated by the purchase of emissions offsets. For further information, see the Air Quality Section of this report.

Because of the relatively small contribution of the plant to estimated background conditions at Class I wilderness areas and emissions reduction mechanisms applied to the plant, this impact is considered less than significant, pending responses from Federal Land Managers.

Linear Facilities and Compressor Station

There are no riparian habitats or sensitive natural communities located at the proposed compressor station or along the linear facilities.

Effect on Aquatic Habitats

Power Plant and Construction Laydown Area

The power plant and laydown areas are not located in or near any surface waters or federally protected wetlands or other jurisdictional waters and therefore, there is no direct loss of this sensitive habitat.

Linear Facilities and Compressor Station

There are no jurisdictional wetlands located within or near the areas affected by the linear facilities and the compressor station. **Biological Resources Table 6** summarizes temporary (0.145 acres) and permanent (0.014 acres) impacts of these facilities to jurisdictional bed and bank features (FWEC 2002e, Data Responses 164 and 168). All of these waters are ephemeral and will be affected by trenching. The applicant has submitted an application to obtain a CWA 404 permit issued by the

USACE and a 401 water quality certification issued by the RWQCB. Construction within these areas will be subject to the conditions of these permits as indicated in Conditions of Certification **BIO-7** and **BIO-9**, as well as measures proposed by the applicant (Condition of Certification **BIO-11**) (FWEC 2002e, Data Response 165). All these measures will be incorporated into the BRMIMP as indicated in Condition of Certification **BIO-5**. A Fish and Game Code1603 permit is not required from the CDFG (FWEC, 2002e; CDFG 2001a). The expansion of Antelope Road as described in the AFC will not extend far enough south to affect these features.

Biological Resources Table 6
List of Affected Waters Subject to the CWA
(FWEC 2002e, Data Response 168)

Water ID Number	Observed Width at OHWM[1] (in feet)	Maximum Potential Acreage of Impact Temporary / Permanent[2]	Dominant or Common Plant Species	Habitat Type
W-1	2	0.029/0.004	Hare barley, downy brome, black mustard, eucalyptus and hairy-leaved sunflower	Upland disturbed
W-2	5	0.051/0.004	Russian thistle, black mustard and hairy-leaved sunflower	Upland disturbed
W-3	2	0.016/0.013	Black mustard and hairy-leaved sunflower	Upland disturbed
W-4	5	0.075/0.009	Russian thistle, black mustard, cocklebur, eucalyptus and hairy-leaved sunflower	Upland disturbed
W-5	2	0.004/0.00	Black mustard	Upland disturbed

1. Ordinary High Water Mark
2. Includes gas line, electrical connection for compressor station, relocation of existing 115 kV line and new 500 kV line. The non-reclaimable wastewater line does not affect any jurisdictional bed and bank features.

Movement or Migration of Fish and Wildlife

Because of the relative lack of cover and continuous disturbance, the IEEC plant site, construction laydown area or any of the linear structures would not cross any major wildlife corridors. None of the project footprint is located within the management areas identified by the draft Western Riverside MSHCP. The plant site, construction laydown area and linear structures are all located within historic Stephens' kangaroo rat habitat; however, there is no known occupied habitat located near the project area. The entire project area would result in the permanent loss of approximately 36.13 acres and temporary disturbance to 38.6 acres of predominantly agricultural and ruderal habitat (Calpine 2001a, Table 3.7-4). Such areas support some portion of native plant species and can provide valuable habitat resources to wildlife when more pristine open space becomes limited. Currently this region is experiencing high growth and the loss of this area is part of that anticipated growth, but much of the area is still undeveloped. The draft Western Riverside MSHCP is not targeting the protection of the open space lands for migration corridors at the power plant site or within one mile.

Temporary and permanent losses are not likely to result in a significant impact to wildlife movement near the project site. Surrounding agricultural lands and the railroad corridor provide alternative routes around the site for wildlife common to these generally disturbed habitats. However, to mitigate such losses the applicant will revegetate temporarily disturbed areas and pay open space fees (see Condition of Certification **BIO-13** and Visual Resources section Condition of Certification **VIS-3**).

Conflict with Adopted Plans

Stephens' Kangaroo Rat HCP

The proposed IEEC would not conflict with the provisions of this plan, or the conditions of the associated incidental take permit. The IEEC has been approved for coverage under the existing Stephens' kangaroo rat HCP for incidental take of Stephens' kangaroo rat (USFWS 2001b; Riverside County 2001a; and CDFG 2001b). As noted above, a Section 7 consultation for the vernal pool fairy shrimp and permitting action by a federal agency necessitate pursuit of an incidental take permit pursuant to the ESA under a single mechanism.

Nitrogen Deposition Effects on Areas Proposed for Management under the Draft Western Riverside MSHCP (Draft MSHCP)

In addition to Class I wilderness areas, the applicant completed an isopleth of nitrogen deposition rates in the project vicinity. The isopleths indicate those areas subject to maximum nitrogen deposition rates of 0.5 to 1.0 kg/ha-yr. The maximum rates are concentrated within one mile to the east and west of the project site, at elevated terrain at Double Buttes about two miles to the southeast, and in areas near Sun City approximately one mile to the south (FWEC 2002c, Data Response 38). It is expected that the plant site region would experience background N-deposition rates from wet and dry deposition between 14-29 kg/ha-yr (FWEC 2002c, Data Response 39), which exceeds the USFS criteria for potential injury (see **Biological Resources Table 5**). The potential contribution from the power plant could result in a 3.5 to 7% increase over current estimated background levels on elevated terrain. The draft Western Riverside MSHCP vegetation maps indicate the elevated terrain supports fragments of coastal sage scrub and chaparral habitat whose slopes are generally unsuitable for agriculture or urban development (Riverside County 2002a).

It is unknown whether soils in this area are nitrogen saturated or whether current levels of nitrogen deposition have translated into losses of coastal sage scrub and the species dependent on this habitat. According to researchers at UC-Riverside (Allen 2002; Tonnesen 2002), contributions of up to 7% of background from a single source in a region where the deposition rates are at levels of concern should be carefully evaluated. Overall, it is likely that the proposed plant's contribution is overestimated since it is assumed that all nitrogen emissions are converted to depositional forms of nitrogen and there is no accounting for the purchase of air quality offsets. In addition, the Industrial Source Complex Short Term (ISCST3) model is sensitive to relief, such that air concentrations and therefore, deposition rates may be unrealistically high on the windward side of hills, when in fact the distribution may be more homogenous throughout the six-mile radius of the analysis.

The ISCST3 model shows a zone of nitrogen deposition, which overlaps with public/quasi public lands and criteria areas, both of which would be managed under the draft Western Riverside MSHCP. The USFWS has expressed their concern that the goals of the draft MSHCP may be affected by such impacts (USFWS 2002b). However, neither representatives for the draft MSHCP or a major organization supporting that effort have registered concerns (Lovelady 2002; EHL 2002a). The draft MSHCP in its current form does not raise nitrogen deposition as a concern, nor does it propose specific management measures for this type of impact.

As noted above for Class I wilderness areas, mechanisms are in place through the use of BACT and emissions reduction credits to ensure that the net contribution of stationary sources like IEEC does not result in a significant deterioration of air quality (see Air Quality section).

For these reasons, the direct and indirect impacts to the draft Western Riverside MSHCP are considered less than significant and no condition of certification is proposed.

Effects on Commercial or Recreational Species

The proposed IEEC would not create an adverse change in commercial or recreational species distribution or population size, or harvesting opportunities for these species. Therefore, no adverse impact is expected, and no condition of certification is proposed.

Effects from Invasive Plant or Wildlife Species

Construction of the IEEC could facilitate the introduction of weedy species as a result of ground disturbance, imported fill or landscaping with non-native species. Weedy plant species growth could suppress native vegetation and infest agricultural lands. However, there is little native vegetation in the immediate project vicinity, and the use of herbicides as part of agricultural practices on lands surrounding the IEEC site should suppress any weed outbreaks that may occur as a result of construction activities. Consistent with the County's general planning conditions, if native drought tolerant species are used for landscaping efforts, this will also ensure that any such impacts are reduced to less than significant levels. Conditions relevant to the use of native species in revegetation efforts and other relevant aspects of landscaping are included in the Visual Resources section, Condition of Certification **VIS–3**.

CUMULATIVE IMPACTS

CEQA defines cumulative impacts as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines, Cal. Code Regs., Title 14, §15355). Cumulative impacts can occur when individually minor but collectively significant projects take place at nearly the same time frame or compound over time.

The identification of projects under the cumulative impacts analysis was based on permit records for new or modified sources filed with the South Coast Air Quality Management District within a 10 km radius and that could reasonably be constructed after the time period for which the ambient analysis occurred (Calpine 2001e, Data Response 10).

Presently staff believes that the IEEC Project may contribute to significant cumulative impacts to terrestrial biological resources from the loss of habitat to vernal pool fairy shrimp and the loss of historical Stephens' kangaroo rat habitat, especially in light of continued commercial and industrial development in this region. The contribution of the IEEC to impacts to historical Stephens' kangaroo rat habitat and potential impacts to vernal pool fairy shrimp habitat are addressed in the Direct and Indirect Impacts section of this assessment. Conditions of Certification **BIO-8** and **BIO-12**, which will be incorporated into the BRMIMP under Condition of Certification **BIO-5**, will reduce all potential impacts to less than significance.

The proposed project's cumulative contribution to nitrogen deposition in forests, coastal sage scrub, chaparral and other habitats within Class I wilderness areas and the draft MSHCP planning area may have a significant impact resulting in the deterioration of the quality of this native habitat and the effectiveness of conservation efforts. When viewed in the context of all current mobile and stationary sources that contribute to existing background conditions in the County, the contribution of the plant is relatively small, and therefore, less than significant.

The IEEC would not induce growth in currently undeveloped or sensitive habitat areas beyond that already projected in County and local development plans. In this respect the draft Western Riverside MSHCP distinguishes between areas that are subject to management under the plan and areas such as those where the IEEC plant is located that are dedicated to development. Therefore, growth inducing impacts are considered less than significant.

FACILITY CLOSURE

Sometime in the future, the IEEC will experience either a planned closure, or be unexpectedly (either temporarily or permanently) closed. When facility closure occurs, it must be done in such a way as to protect the environment and public health and safety. To address facility closure, an "on-site contingency plan" would be developed by the project owner, and approved by the Energy Commission Compliance Project Manager (CPM). Facility closure mitigation measures will also be included in BRMIMP prepared by the applicant.

The surrounding area is predominantly agricultural, including the area proposed for the project. At the plant site and construction laydown areas no sensitive habitats or vegetation dominated by native species will be cleared or disturbed. Linear facilities (i.e., transmission lines from the plant or the compressor station, gas pipeline or reclaimed water pipeline) will permanently affect 0.014 acres of bed and bank features subject to Section 4 of the CWA (FWEC 2002e, Data Response 165) and may potentially affect vernal pool fairy shrimp habitat. However, permanent or temporary loss or disturbance of these areas will be fully mitigated to less than significant levels as a condition of project construction. Therefore, it is presumed that when the plant is closed, restoration to pre-construction conditions would not be necessary, even if the plant were closed before the anticipated 30-year operational period.

If the power plant facilities are closed after an anticipated 30-year operational period, the surrounding areas may be more highly industrialized and densely populated. In this case, restoration of any of the project area to natural habitat that existed prior to the current agricultural development would be even less practical.

While structures are being removed and the area is being stabilized during plant closure, all parties involved should follow applicable measures prescribed for construction in the BRMIMP in Conditions of Certification **BIO-1** through **BIO-5** and closure as indicated in Condition of Certification **BIO-6** to address potential impacts to biological resources. The equipment used, traffic, human presence and nature of the disturbance during closure is similar enough, such that application of the same mitigation measures implemented during construction would be appropriate.

MITIGATION

Applicant's Proposed Mitigation

Impact Avoidance

The applicant has proposed in the AFC and the proposed BRMIMP several impact avoidance measures to reduce impacts to biological resources in the IEEC area (Calpine 2001a, page 5.3-37; FWEC 2002c, Data Response 42; FWEC 2002e, Data Response 172). The applicant will:

- Submit to the Compliance Program Manager (CPM) a final BRMIMP;
- Designate a project biologist to manage all biological resource conditions of certification;
- Develop and institute and Employee Environmental Awareness Program to inform construction and operations workers about biological resources associated with the project generally and specifically with respect to potential fairy shrimp habitat.
- Minimize biological impacts to potential fairy shrimp habitat to the maximum extent possible by siting facilities away from such sensitive habitats, within disturbed agricultural fields, adjacent to or within existing road or established utility rights-of-way (ROW); and
- Comply with all conditions resulting from the Section 7 consultation with the USFWS.

These measures have been incorporated into the Conditions of Certification found below.

Payment of Fees

The applicant has proposed to provide funds for impacts to historic Stephens' kangaroo rat habitat within the Fee Area in accordance with requirements of the Riverside County Stephens' kangaroo rat HCP for the plant site, natural gas pipeline and associated compressor station site, transmission line and non-reclaimable wastewater line (FWEC 2002e, Biological Resource Attachment 5; FWEC 2002, Data Response 42) (see Condition of Certification **BIO-12**).

Should it be deemed appropriate in the Section 7 process, the applicant has also proposed to provide funds to purchase vernal pool habitat from USFWS approved mitigation bank for project impacts associated with potential fairy shrimp habitat (FWEC 2002e, Data Response 172). This proposed mitigation is incorporated into Condition of Certification **BIO-5**.

Construction Measures

The applicant has proposed to restore temporarily disturbed sites to their pre-existing physical condition (FWEC 2002e, Data Response 165), which would mitigate for the large majority of land disturbed by the linear features and the compressor substation (see Condition of Certification **BIO-11**). The applicant has also proposed to preserve any potential threatened and endangered fairy shrimp habitat and fairy shrimp cysts with the following measures (FWEC 2002e, Data Response 165 and Biological Resource Attachment 5):

- The area will be marked and surveyed by the site biologist prior to construction;
- The trenching in and adjacent to this area will be accomplished by hand;
- Topsoil (top 24 inches) will be carefully removed and relocated temporarily for safe storage;
- Subsequent to construction of the underground line, trench material will be placed back in the trench in the reverse order from which it is removed; and
- The topsoil will then be placed back in the survey area and recontoured to match the original pre-survey slopes and drainage pattern. Compaction of the topsoil will be accomplished by hand methods.

These construction measures would be incorporated into the BRMIMP (see Condition of Certification **BIO-11**) and modified as needed to reflect the terms and conditions set forth in the USFWS Biological Opinion, CWA 404 permit, or 401 water quality certification (see Condition of Certification **BIO-5**).

Staff's Proposed Mitigation

Fairy Shrimp Mitigation

The applicant should demonstrate through adequate survey methodology that listed fairy shrimp species do not occur on the proposed project site or assume they are present and establish sufficient avoidance, compensation and/or mitigation measures to reduce impacts to potential fairy shrimp to less than significant levels as indicated by the results of consultation with the USFWS, addressed in Condition of Certification **BIO-8**.

Open Space Fees

Staff recognized that the continual loss of open space lands in the County could impact wildlife species migration. The permanent losses of undeveloped land would be mitigated through payment of an open space fee assessed by the County as indicated in Condition of Certification **BIO-13**. The open space fee funds the acquisition of open space and preservation of habitat for wildlife necessary to mitigate the direct and cumulative environmental effects generated by new development projects described

and defined in the County ordinance. One of the goals of the draft Western Riverside MSHCP is to provide long-term management of wildlife corridors throughout areas that now or in the future will be subjected to development pressures and provide an additional source of conservation planning to reduce or avoid impacts to wildlife migration or movement. The use of the County fees to purchase open space would aid this goal.

Purchase of Emission Credits

Staff identified that power plant emissions, if unmitigated, would contribute to the degradation of air quality in the basin and possibly change the vegetation communities. The IEEC plant will implement BACT, which means that controls at the source will achieve the maximum reduction of nitrogen emissions technically feasible. In addition, credits are purchased through a market system at a ratio equal or greater than 1:1 (see Air Quality Section). The ratio is in part determined by whether the credits are purchased locally (smaller ratio) or regionally (higher ratio) (see Air Quality Section). Mechanisms are in place to encourage purchase of credits locally. Although this addresses only stationary sources the objective is to ensure that the IEEC should not significantly deteriorate air quality.

The purchase of emission credits at a ratio greater than 1 places partial responsibility on the applicant to contribute to the long-term improvement of air quality by compensating for sources in addition to the plant. This is an important tool for addressing cumulative impacts to Class I wilderness areas. For local impacts, the draft Western Riverside MSHCP does not provide a mechanism that allows potential nitrogen deposition effects from the plant to be related to sensitive species or their habitat within the planning area. For these reasons staff does not presently proposed any conditions of certification related to this impact. Final conclusions are also pending responses from Federal Land Managers for Class I wilderness areas.

Preconstruction Surveys

Because of the dynamic and transient nature of wildlife use in the project area and its proximity to habitat occupied by federal or state listed threatened or endangered species, the applicant should complete biological surveys for the presence of such species prior to initiating mobilization and construction activities. The protocol for such monitoring shall be consistent with USFWS and CDFG guidelines and shall be described in the applicant's BRMIMP outlined in Condition of Certification **BIO-5**.

Managing the Construction Site

In addition to the Stephens' kangaroo rat incidental take measures, staff proposes additional pre-construction and construction measures as part of Conditions of Certification **BIO-10**, **BIO-11** and **VIS-3** (in Visual Resources section) to ensure that impacts to biological resources are reduced to less than significant levels. Some of these conditions were proposed in the applicant's draft Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and in data responses (FWEC 2002e, Data Response 165).

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

POWER PLANT AND CONSTRUCTION LAYDOWN AREA

There are several local ordinances that pertain to planting and landscaping, open space and Stephens' kangaroo rat habitat fees, light pollution, etc. that are noted in the LORS Section of this assessment and are addressed in Conditions of Certification **BIO-5**, **BIO-12** and **BIO-13**. The applicant has spoken informally with the USFWS, as well as the CDFG and Riverside County to ensure compliance with the ESA for potential impacts to Stephens' kangaroo rat; and Section 7 consultation through the USACE is in progress (CEC 2002l). The conclusions of the USFWS consultation will be incorporated as Condition of Certification **BIO-8** to ensure that any related impacts are reduced to levels that are less than significant.

Potential impacts to sensitive coastal sage scrub and chaparral habitat resulting from nitrogen deposition are presently not subject to LORS. The analysis and interpretation of significance is based on published guidelines.

LINEAR FACILITIES AND COMPRESSOR STATION

The applicant has submitted permit applications to ensure compliance of the IEEC project with Sections 401 and 404 of the CWA (FWEC 2002e, Data Response 165). The applicant has also spoken informally with the USFWS to ensure compliance with the ESA for potential impacts to Stephens' kangaroo rat and vernal pool fairy shrimp and has submitted a draft Biological Assessment to the USACE and USFWS in anticipation that a consultation for these species is needed (CEC 2002l). The conditions of these permits will be incorporated as Conditions of Certification **BIO-7** and **BIO-9** to ensure that any related impacts are reduced to levels that are less than significant.

UNRESOLVED ISSUES, RECOMMENDATIONS AND CONCLUSIONS

The following issues remain unresolved or pending response from federal, state and local government agencies:

- Staff will continue to work with Riverside County to reach concurrence on the assessment of fees for occupation of historical Stephens' kangaroo rat habitat;
- Staff will continue to work with Riverside County to reach concurrence on the assessment of open space fees;
- Applicant shall provide the results of the Section 7 consultation in the form of a permit or correspondence from the USFWS for potential impacts to Stephens' kangaroo rat and vernal pool fairy shrimp pursuant to the ESA; and
- Federal Land Managers are expected to provide information relating to nitrogen deposition in Class I wilderness areas.

Staff feels that ESA compliance and conclusion of consultation with the USFWS will be resolved prior to the issuance of the Final Staff Assessment. Staff currently understands that the applicant is pursuing avoidance of potential fairy shrimp habitat with the USFWS as the most viable resolution to this potential impact and a permit will not be required (CEC 2002l; USFWS 2002b). It is unlikely that new issues or different mitigation will result from the process as staff and the applicant have worked closely with both the USFWS and USACE. With respect to Federal Land Manager review, in previous siting cases, the Federal Land Manager's concerns were ameliorated after review of the applicant's materials related to BACT and the purchase of emission credits.

CONDITIONS OF CERTIFICATION

BIO-1 The project owner shall submit the resume, including contact information, of the proposed Designated Biologist to the CPM for approval.

Verification: The project owner shall submit the specified information at least 60 days prior to the start of any site (or related facilities) mobilization. Site and related facility activities shall not commence until an approved Designated Biologist is available to be on site.

The Designated Biologist must meet the following minimum qualifications:

1. Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;
2. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society; and
3. At least one year of field experience with biological resources found in or near the project area.

If a Designated Biologist needs to be replaced, then the specified information of the proposed replacement must be submitted to the CPM at least ten working days prior to the termination or release of the preceding Designated Biologist.

BIO-2 The Designated Biologist shall perform the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities:

1. Advise the project owner's Construction/Operation Manager, supervising construction and operations engineer on the implementation of the biological resources Conditions of Certification;
2. Be available to 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 or their habitat;
3. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;

4. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (parking lots) for animals in harms way;
5. Notify the project owner and the CPM of any non-compliance with any biological resources Condition of Certification; and
6. Respond directly to inquiries of the CPM regarding biological resource issues.

Verification: The Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted in the Monthly Compliance Reports.

During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

BIO-3 The project owner's Construction/Operation Manager shall act on the advice of the Designated Biologist to ensure conformance with the biological resources Conditions of Certification.

If required by the Designated Biologist, the project owner's Construction/Operation Manager shall halt all site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist.

The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there would be adverse impact to biological resources if the activities continued;
2. Inform the project owner and the Construction/Operation Manager when to resume activities; and
3. Notify the CPM if there is a halt of any activities, and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the halt.

Verification: The Designated Biologist must notify the CPM immediately (and no later than the following morning of the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities. The project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

BIO-4 The project owner shall develop and implement a CPM approved Worker Environmental Awareness Program (WEAP) in which each of its employees,

as well as employees of contractors and subcontractors who work on the project site or any related facilities during site mobilization, ground disturbance, grading, construction, operation and closure are informed about sensitive biological resources associated with the project.

The WEAP must:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material 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;

5. Identify whom to contact if there are further comments and questions about the material discussed in the program; and

6. Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines.

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

Verification: At least 60 days prior to the start of any site (or related facilities) mobilization, the project owner shall provide to the CPM two (2) copies of the WEAP and all supporting written materials prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The project owner shall provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date.

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

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

BIO-5 The project owner shall submit two copies of the proposed BRMIMP to the CPM (for review and approval) and to CDFG and USFWS (for review and comment) and shall implement the measures identified in the approved BRMIMP.

The final BRMIMP shall identify:

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

2. All Biological Resource Condition of Certification identified in the Commission's Final Decision;

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

4. All biological resources mitigation, monitoring and compliance measures required in other state agency terms and conditions, such as those provided in the RWQCB permit;

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

6. All incidental take minimization measures as provided in the Stephens' kangaroo rat HCP or as specified by the Stephens' kangaroo rat Habitat Conservation Agency;

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

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

9. Required habitat compensation strategy, including provisions for acquisition, enhancement, and management for any temporary and permanent loss of sensitive biological resources;

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

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

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

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

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

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

16. A discussion of biological resources related facility closure measures;

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

18. A copy of all biological resources related permits.

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

The CPM, in consultation with the CDFG, the USFWS and any other appropriate agencies, will determine the BRMIMP's acceptability within 45 days of receipt.

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

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

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 site mobilization, ground disturbance, grading, and construction phases, and which mitigation and monitoring items are still outstanding.

BIO-6 The project owner will incorporate into the permanent or unexpected permanent closure plan, and the BRMIMP, measures that address the local biological resources.

The planned permanent or unexpected permanent closure plan will address the following biological resources related mitigation measures (typical measures are):

1. Removal of transmission conductors when they are no longer used and useful;

2. Removal of all power plant site facilities and related facilities;

3. Measures to restore wildlife habitat to promote the re-establishment of native plant and wildlife species; and

4. Revegetation of the plant site and other disturbed areas utilizing appropriate seed mixture.

Verification: At least twelve months prior to commencement of closure activities, the project owner shall address all biological resources related issues associated with facility closure, which is incorporated into the BRMIMP, 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.

BIO-7 The project owner will acquire the Regional Water Quality Control Board Section 401 state Clean Water Act certification, and incorporate the biological resource related terms and conditions into the project's BRMIMP.

Verification: At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner will provide the CPM with a copy of the final Regional Water Quality Control Board's certification.

BIO-8 The project owner shall provide final copies of the Biological Opinion per Section 7 of the federal Endangered Species Act obtained from the U. S. Fish and Wildlife Service (if needed). The terms and conditions contained in the Biological Opinion shall be incorporated into the project's BRMIMP (if needed).

Verification: At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit to the CPM a copy of the U. S. Fish and Wildlife Service's Biological Opinion (if needed).

BIO-9 The project owner shall provide a final copy of the U.S. Army Corps of Engineers Section 404 of the federal Clean Water Act permit. The biological resources related terms and conditions contained in the permit shall be incorporated into the project's BRMIMP.

Verification: At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit to the CPM a copy of the U.S. Army Corps of Engineers permit.

BIO-10 the project owner shall modify the project design to incorporate all feasible measures that avoid or minimize impacts to the local biological resources.

Typical measures are:

1. Design transmission line poles, access roads, pulling sites, and storage and parking areas to avoid identified sensitive resources;

2. Screen the water intake pipes that use natural waterways in a manner to avoid entrainment;

3. Avoid wetland loss; and

4. Design and construct transmission lines and all electrical components to reduce the likelihood of electrocutions of large birds.

Verification: All mitigation measures and their implementation methods will be included in the BRMIMP.

BIO-11 The project owner shall manage their construction site, and related facilities, in a manner to avoid or minimizes impacts to the local biological resources.

Typical measures are:

1. Temporarily fence and provide wildlife escape ramps for construction areas that contain steep walled holes or trenches if outside of an approved, permanent exclusionary fence. The temporary fence will be hardware cloth or similar materials that are approved by USFWS and CDFG;
2. Make certain all food-related trash will be disposed of in closed containers and removed at least once a week. Feeding of wildlife shall be prohibited;
3. Prohibit non-security related firearms or weapons from being brought to the site;
4. Prohibit pets from being brought to the site;
5. Report all inadvertent deaths of sensitive species to the appropriate project representative. Injured animals will be reported to CDFG and the project owner will follow instructions that are provided by CDFG.
6. Restore temporarily disturbed sites to their pre-existing physical condition; and
7. In areas with potential vernal pool cyst, the applicant will perform the following:
    - The area will be marked and surveyed by the site biologist prior to construction.
    - The trenching in and adjacent to this area will be accomplished by hand.
    - Topsoil (top 24 inches) will be carefully removed and relocated temporarily for safe storage.
    - Subsequent to construction of the underground line, trench material will be placed back in the trench in the reverse order from which it is removed.

Verification: All mitigation measures and their implementation methods will be included in the BRMIMP.

BIO-12 Prior to site or related facilities mobilization, the IEEC shall comply with the provisions of Riverside County Ordinance No. 663, which requires the payment of fees for permanent and temporary loss of historical Stephens' kangaroo rat habitat within the Stephens' kangaroo rat HCP fee assessment area. The purchase of habitat credits shall be based on the most current fees assessed by Riverside County. Monies will be paid directly to the Riverside County Habitat Conservation Agency.

Verification: Within five days after certification, the project owner shall demonstrate to the CPM evidence of receipt of payment of the Stephens' kangaroo rat habitat fee by the County of Riverside. Within 20 days of certification (or other CPM-approved timeframe), the project owner shall provide to the CPM a written certificate or letter from the County of Riverside stating the date and amount of funds received.

BIO-13 The applicant shall pay an Interim Open Space Mitigation Fee in the amount assessed in accordance with Riverside County Ordinance No. 810 to assist in providing revenue to acquire and preserve open space and habitat (Riverside 2002a). The amount of the fee for industrial development shall be calculated on the basis of "project area", which shall mean the area, measured in acres, from the adjacent road right-of-way to the limits of the project development (Riverside 2002a) using the most current fee rates. Any area identified as "no use proposed" on the approved exhibit A (i.e., the applicant's AFC, Calpine 2001a) shall not be included in the project area (Riverside 2002a).

Verification: Within five days after certification, the project owner shall submit to the CPM, documentation that payment has been made to the County of Riverside, for the Interim Open Space Mitigation Fee. Within 20 days of certification (or other CPM-approved timeframe), the project owner shall provide a letter from the County of Riverside stating the date and amount of funds received for open space and habitat mitigation.

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CULTURAL RESOURCES

Roger Mason and Gary Reinoehl

INTRODUCTION

This cultural resources section identifies potential impacts of the proposed Inland Empire Energy Center on cultural resources, as defined under state and federal law. The primary concern in cultural resources analysis for this project is to ensure that all potential impacts are identified and that conditions are set forth that ensure that impacts are mitigated below a level of significance under the California Environmental Quality Act.

Staff provides a cultural overview of the project, as well as analyses of potential impacts from the project using criteria from the California Environmental Quality Act (CEQA) and the National Historic Preservation Act. If cultural resources are identified, staff determines whether there may be a project related impact to identified resources and if the resource is eligible for the California Register of Historic Resources (CRHR) or the National Register of Historic Places (NRHP). If the resources are eligible for either register, staff recommends mitigation that attempt to ensure that no significant impacts will occur and that will reduce impacts to the cultural resource to a less than significant level, if possible.

There is always a potential that a project may impact a previously unidentified resource or may impact an identified historical resource in an unanticipated manner. Staff therefore recommends procedures in the conditions of certification that mitigate these potential impacts.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The following laws, ordinances, regulations, standards, and policies apply to the protection of cultural resources in California. Projects licensed by the Energy Commission are reviewed to ensure compliance with these LORS.

FEDERAL

- Code of Federal Regulations, 36 CFR Part 61. Federal Guidelines for Historic Preservation Projects: The U.S. 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 historic 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 mitigation of impacts to cultural resources on public lands in California.
- Code of Federal Regulations, 36 CFR Part 800 et seq., the implementing regulations of Section 106 of the National Historic Preservation Act, 16 U.S.C. § 470 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. The regulations implementing this act, which were revised in 1997, set forth procedures to be followed for determining eligibility of cultural resources, determining the effect of the undertaking on the historic properties, and how the effect will be taken into account. The eligibility criteria and the process described in these regulations are used by federal agencies. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the California Register of Historical Resources.

STATE

- California Code of Regulations, Title 14, section 4852 defines the term "cultural resource" to include buildings, sites, structures, objects, and historic districts.
- Public Resources Code, Section 5000 establishes the California Register of Historic Places (CRHR), establishes criteria for eligibility to the CRHR, and defines eligible resources. It identifies any unauthorized removal or destruction of historic resources on sites located on public land as a misdemeanor. It also prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and establishes the penalty for possession of such artifacts with intent to sell or vandalize them as a felony. This section defines procedures for the notification of discovery of Native American artifacts or remains, and states that it is the policy of the State that Native American remains and associated grave artifacts shall be repatriated.
- The California Environmental Quality Act (CEQA) (Public Resources Code, section 21000 et seq.; Title 14, California Code of Regulations, section 15000 et seq.) requires analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.
- Public Resources Code section 21083.2 states that the lead agency determines whether a project may have a significant effect on “unique” archaeological resources; if so, an Environmental Impact Report (EIR) shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, the lead agency may require reasonable steps to preserve the resource in place. Otherwise, mitigation measures shall be required as prescribed in this section. The section discusses excavation as mitigation; limits the Applicant’s cost of mitigation; sets time frames for excavation; defines “unique and non-unique archaeological resources;” and provides for mitigation of unexpected resources. [The California Energy Commission process is a CEQA equivalent process and Staff Assessments replace the CEQA environmental documents.]
- 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(b), prescribes the manner of maintenance, repair, stabilization, restoration, conservation, or reconstruction as mitigation of a project’s impact on a historical resource; discusses documentation as a mitigation measure; and discusses

mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery through 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, section 15064.5 defines the term "historical resources," explains when a project may have a significant effect on historic resources, describes CEQA's applicability to archaeological sites, and specifies the relationship between "historical resources" and "unique archaeological resources."
- Penal Code, section 622 1/2 states that anyone who willfully damages an object or thing of archaeological or historic interest is guilty of a misdemeanor.
- California Health and Safety Code, section 7050.5 states that if human remains are discovered during construction, the project owner is required to contact the county coroner.

LOCAL

Riverside County

The County of Riverside protects cultural resources by reviewing development applications for compliance with CEQA. More specifically, the Riverside County Comprehensive General Plan Land Use Standards require the Planning Department to determine whether proposed development will alter or destroy an historical site or an archaeological site, cause a substantial adverse change in the significance of an historical or archaeological resource (cf. California Code of Regulations 15064.5), disturb any human remains, or restrict existing religious or sacred uses.

- Riverside County's General Plan identifies two objectives for Historic and Prehistoric Resources. The first objective requires that significant historic and prehistoric resources are identified and documented, and that there are provisions for the preservation of representative and worthy examples. The second objective recognizes the value of these resources and requires that land uses be assessed for impacts to these resources. Cultural resources technical reports submitted to the County must follow a required outline and the consultant must be pre-qualified to submit reports to the County.
- In addition, Riverside County's Ordinance 578, which was intended to create and protect historic districts within the county, addresses a desire on the part of the County to preserve the its heritage. The Ordinance does not specifically address archeological resources or historic resources outside designated districts.

ENVIRONMENTAL SETTING

The energy center property and associated linear routes for natural gas, waste water, and transmission lines are located near the community of Romoland in western Riverside County. Romoland is a small-unincorporated community of modest residences and industrial enterprises located just outside the southeastern city limits of Perris. The project area is at an elevation of about 1,440 feet on the relatively level floor of the Perris Valley. The valley is bounded on the south by hills that attain elevations of over 2,000 feet. The San Jacinto River flows from northeast to southwest across this

plain about two miles northwest of the project area. The energy center property, the gas pipeline route, the transmission line route, and part of the waste water pipeline route are on vacant land that is currently under cultivation, and may have been used for grazing in the past. The rest of the wastewater pipeline route follows paved roads into the nearby community of Sun City.

Refer to the **PROJECT DESCRIPTION** section of this Preliminary Staff Assessment for additional information and maps of the project development region and the project area.

PREHISTORIC SETTING

No chronology for the prehistoric period has been developed specifically for the western Riverside County area. Consequently, the better known sequence for northern San Diego County is presented here.

The San Dieguito Complex (a group of artifacts and subsistence remains that are characteristic of a specific period of time and geographic area) was originally thought to represent Early Holocene (8,000 to 10,000 Before Present) big game hunters who moved to the San Diego county coastal area from the Great Basin when warmer drier conditions at the end of the Pleistocene resulted in desiccation of the pluvial lakes in the Great Basin (Warren 1967). Because large projectile points were found at the Harris site (SDI-149), a San Dieguito site on the San Dieguito River, it was thought that big game hunting continued after these people arrived on the coast during the Early Holocene (Ezell 1987). However, more recent investigations at other sites dating to the Early Holocene closer to the coast, such as SDI-10,965 (Gallegos 1991) and SDI-9649 (Koerper et al. 1991), showed that a wide range of plant foods, along with small and medium size terrestrial mammals, fish, and shellfish, were being exploited in these sites during the Early Holocene. Population size was likely low with relatively little competition for resources. Therefore, small groups probably moved throughout the coastal area and the Peninsular Ranges to wherever the best resources were available at the time, although they may not have moved very far or often.

The La Jolla Complex represents the material remains of people who occupied the San Diego County coast during the Middle Holocene between about 8,000 and 3,000 Before Present (BP). Most La Jolla Complex sites are located around the coastal lagoons which began filling with sea water at the beginning of this period because of a rise in the sea level as the ice caps melted at the end of the last ice age. Shellfish from these lagoons were an important part of the diet. La Jolla Complex sites contain fire-affected rock features (probably hearths). Most flaked stone tools are core-cobble tools and ground stone tools, such as manos and metates, are abundant. Projectile points (dart points) are present, the most characteristic type being Elko-Eared.

The Pauma Complex is found at inland sites at the same time as the La Jolla Complex and is very similar to the La Jolla Complex, although coastal subsistence remains, such as fish and shellfish, are absent. The Perris Valley area could have been occupied by people with a Pauma Complex culture during the Middle Holocene. The Pauma Complex may represent the inland part of a seasonal round of some of the same groups that occupied sites near the coast during other seasons of the year. Alternatively, the La Jolla and Pauma Complexes may represent separate coastal and inland groups that

shared similar technology and subsistence adaptations, although the Pauma Complex would have lacked direct access to coastal resources. The most common Pauma Complex artifacts are manos (usually bifacial and shaped by pecking). Other artifacts include oval basin metates, scrapers, scraper planes, hammers, hammer-grinders, and bifaces (projectile points and knives) (True 1980). Bifaces are not common on Pauma Complex sites, however. Discoidals and stone balls, which appear to be non-utilitarian artifacts, are rare. Pauma Complex sites in northern San Diego County are located on old Pleistocene soils on mudflows and terraces. Pauma sites have no midden or anthrosol (culturally modified soil) and the artifacts are on the surface or come from relatively shallow depths (True 1980). These sites appear to represent temporary camps for seed collection and processing. It is likely that larger residential bases also existed, probably in river and stream valleys, but later alluvial deposits may have buried these sites.

There are few sites that date to the period from 3,000 to 1,300 BP in northern San Diego County. The coastal lagoons silted in, reducing or eliminating shellfish yields. However, few inland sites date to this period, as well. Little is known about settlement and subsistence during this period of San Diego County and western Riverside County prehistory.

A larger population, a more sedentary settlement system, and a more intensive use of available resources characterize the Late Period from 1,300 to 100 BP. The large villages occupied almost year-round seen by the Spanish in A.D. 1769 developed during this period. Acorns were added to the diet, as indicated by the presence of bedrock mortars at inland processing sites and residential sites. Acorns require a great deal of labor to process and were added to the diet relatively late in prehistory when increasing numbers of people required additional sources of calories. Ceramics and obsidian from the Obsidian Butte source at the south of end of Lake Cahuilla (now the Salton Sea) also appeared toward the end of the Late Period. The Late Period is also characterized by use of the bow and arrow, rather than spear-thrower and dart, which had been used previously.

In northern San Diego County and western Riverside County the Late Period is represented by the San Luis Rey culture. Village sites have bedrock mortars, pestles, manos, metates, triangular arrow points, bone awls and shell artifacts. The San Luis Rey culture has been divided into two phases, San Luis Rey I (SLR I) and San Luis Rey II (SLR II) (True et al. 1974). SLR II is distinguished from SLR I by the addition of pottery vessels, pictographs, and cremation of the dead. After European contact, non-native artifacts such as glass beads and metal knives appear. SLR I phase is thought to extend from A.D. 1400 (about 550 B.P., computed from 1950) to A.D. 1750. It may, however, have begun earlier. SLR II (A.D. 1750 to 1850) was quite brief and falls mostly within the historic period that began with the overland arrival of the Spanish in AD 1769.

ETHNOGRAPHIC BACKGROUND

The study area was within the territory used by the Cahuilla (Kroeber 1925; Bean 1972, 1978). The Cahuilla language belongs to the Takic family of the Uto-Aztecan linguistic classification. Cahuilla territory coincided with much of present day Riverside County,

extending from the Perris area east through the San Jacinto and Santa Rosa Mountains to the Coachella Valley and the north end of the Salton Sea (Bean 1978:Fig. 1). Except to the south, the Cahuilla had other Takic speaking groups as neighbors. The Serrano were located to the north in the San Bernardino Mountains, the Gabrielino were to the northwest, and the Juaneño and Luiseño were located to the west and southwest. The Hokan speaking Ipai and Tipai were located to the south.

Strong (1929) described the Cahuilla as falling into three major groups: the Desert, Pass, and Mountain Cahuilla. These distinctions are largely geographic, but minor dialectic and some rather important cultural differences existed (Strong 1929:36). The Mountain Cahuilla lived primarily within the San Jacinto and Santa Rosa Mountain ranges (Strong 1929:144-145). The Pass Cahuilla were located primarily within San Gorgonio Pass, but Strong (1929:88-89) somewhat arbitrarily includes the desert populations of Palm Springs and Indian Wells within this group. The Desert Cahuilla were those groups within the Coachella Valley from just south of Indian Wells to the northern end of the Salton Sea and the San Diego County line (Strong 1929:37-39).

The Cahuilla sustained themselves through hunting, gathering, and fishing. Major villages were fully occupied during the winter, but during other seasons task groups made periodic forays to collect various plant foods, with larger groupings from several villages organizing for the annual acorn harvest (Bean and Saubel 1972:126). Bean and Saubel (1972) have recorded the use of several hundred species of plants used for food, building/ artifact materials, and medicines. The major plant foods included acorns, pinyon nuts, and various seed-producing legumes. These were complemented by agave, wild fruits and berries, tubers, cactus bulbs, roots and greens, and other seeds.

Hunting focused on both small and medium-sized mammals, such as rabbits and rodents, and large mammals, such as pronghorn sheep, mountain sheep, and mule deer. Hunting was done using the throwing stick or the bow and arrow, though nets and traps were also used for small animals (Bean 1972:64-65).

Cahuilla material culture consisted of dome-shaped to rectangular type houses; above-ground granaries; baskets, pottery, and grinding implements; stone tools, arrowshaft straighteners and bows; clothing (loincloths, blankets, rope, sandals, skirts, and diapers); and various ceremonial objects made from mineral, plant, and animal substances.

HISTORIC SETTING

Spanish missionaries began their exploration of California and development of the missions in 1769, starting in San Diego and ending with the missions in San Rafael and Sonoma established in 1823. Mission San Gabriel Arcangel was founded in 1771 east of what is now Los Angeles in Gabrielino territory. Mission San Luis Rey was established in 1798 on the San Luis Rey River in Luiseno territory. Both missions later established asistencias, or mission outposts, in inland areas. An asistencia of the San Gabriel Mission, known as the San Bernardino Rancho Asistencia, was founded in 1819 near the boundary of Gabrielino, Cahuilla and Serrano territories near present-day Redlands. An asistencia of the San Luis Rey Mission, known as San Antonio de Pala,

was founded in Luiseno territory further up the San Luis Rey River near Mount Palomar in 1816. No missions or asistencias were established in Cahuilla territory.

After Mexico became independent from Spain in the early 1830's, the Mexican government closed the missions. Former mission lands were granted to soldiers and other Mexican citizens for use as cattle ranches. The San Jacinto Nuevo y Potrero land grant was north of the project area and included the northern Perris Valley and southern Moreno Valley areas. It was granted to Miguel Pedrorena in 1846 (Avina 1932:87). The project area itself was not included in a land grant. Ranching continued during the American period that began when the Treaty of Guadalupe Hidalgo was signed between Mexico and the United States in 1848.

There was little ranching or agricultural activity in the Perris Valley, however, until after the railroad arrived in the 1880s. Because of the lack of water, the Perris Valley was described as a barren plain barely fit for sheep pasture (Calpine 2001a:5.16-9).

The California Southern Railway completed its line from National City (near San Diego) to San Bernardino in 1883 (Gunther 1984:385). The railway passed through the Perris Valley (known then as part of the San Jacinto Plains) and the mining town of Pinacate, the first settlement in the Perris Valley. The railroad put in a switch and siding at Pinacate which served gold miners in the adjacent (to the west) Pinacate Mining District, organized in 1878. Pinacate was located about 2 miles south of what later became the town of Perris. A post office was established in Pinacate in 1881. The town of Pinacate was platted in 1885 and soon had a post office, railway station, two stores, blacksmith, livery stable, and school (Gunther 1984:391-92).

Land title disputes prompted some Pinacate residents to start a new town along the railway two miles north. When Frederick Perris, Chief Engineer and Superintendent of Construction for the California Southern Railway, agreed to move the switch and siding to the new town, the town promoters named the town after him. The town of Perris was platted in 1886 and most of the Pinacate businesses and buildings were moved to Perris.

A railroad spur was built from Perris to Hemet and San Jacinto in 1888 (Gunther 1984:231). This is the railroad line that passes through the project area. The first settlement in the project area was Ethanac, located on the south side of the tracks near what is now Romoland. The name Ethanac is based on an acronym for Ethan Allen Chase, president of the Chase Nursery Company. The Ethanac post office was established in 1900. The principal activity at Ethanac was growing alfalfa on 1200 acres of land using irrigation water pumped from wells. However, as the Temescal Water Company diverted groundwater away from the area, population declined to almost nothing by 1920 (Gunther 1984:181).

Romoland was established on the north side of the tracks opposite Ethanac in 1925 by the Pacific Mutual Life Insurance Company which offered 4 to 5 acre plots for the cultivation of fig trees in Romola Farms, the original name of Romoland. However, several of the land sale promoters were found guilty of mail fraud. Romola Farms No. 2 was platted by the Los Angeles Missionary and Church Extension Society of the Methodist Episcopal Church later in 1925. They held evangelical meetings in large

tents. The name of the Ethanac post office was changed to Romoland in 1926 and was moved across the tracks to the new town. The name Romola Farms was not used by the post office to avoid confusion with Ramona in San Diego County (Gunther 1984:436). More recently industrial facilities, such as concrete block manufacturing, metal fabrication, and construction equipment yards have developed along the railroad in Romoland. Some individuals that work in these industrial facilities occupy nearby homes that were built in the 1920s.

RESOURCES INVENTORY

Literature and Records Search

Prior to preparation of the AFC, the Applicant conducted a cultural resources literature search and reviewed site records and maps for the project area at the Eastern Information Center of the California Historic Resources Information System (CHRIS) located at the University of California, Riverside on June 20, 2001 (Calpine 2001a:5.16-10). The records searches included the energy center site and one quarter mile on each side of the project linear routes (Calpine 2001a:5.16-11). No previously recorded cultural resources were identified on the energy center property nor along the project linear routes, which include the Menifee Road natural gas pipeline route and compressor station site, the non-reclaimable wastewater pipeline, and the transmission line (Calpine 2001a:5.16-19,20).

The Applicant determined that there are no historical resources within one half mile of the energy center site or the project linear routes listed on any Riverside County historical inventory or register (Data Response 47: FWEC 2002c). The Applicant also contacted a representative of the Lake Elsinore Historical Society who stated they were not aware of any historic resources in the vicinity of Romoland (Data Response 48: FWEC 2002c).

Field Surveys

The Applicant performed an intensive pedestrian survey (archaeological) of the property proposed for the Inland Empire Energy Center and the associated linear routes. The survey of the power plant property was performed by walking parallel 20 meter transects. An area 100 feet wide on each side of the centerline of the linear routes was surveyed by walking two parallel transects on each side of the road or other route centerline (Calpine 2001a:5.16-11). No archaeological resources were identified as a result of these surveys. Wooden power poles were observed along the transmission line route and irrigation risers and breathers were observed along the wastewater pipeline route along McLaughlin Road. However, neither of these linear features are old enough to constitute a potential historical resource. A representative of Southern California Edison stated that the wooden power poles were placed in 1984 and a representative of Eastern Municipal Water District indicated that the irrigation system along McLaughlin Road is less than 45 years old (Data Response 43: FWEC 2002c).

Staff requested that the Applicant also provide an inventory and evaluation of buildings and structures from the historic period, conducted by an architectural historian or person with an appropriate historic background (Data Request 44: FWEC 2002c). The inventory included all structures more than 45 years old within a half mile of the energy

center. No buildings more than 45 years old were identified along the project linear routes. The 60 inventoried buildings were photographed and their addresses were listed. Recording and evaluation were performed for the 15 inventoried structures from which at least 50 percent of the energy center will be visible. Photographs were taken and DPR 523 forms (including primary records and building, structure, object records) were completed for these 15 properties. Construction dates were obtained from Riverside County records, where available (Data Response 44: FWEC 2002c).

The 15 evaluated properties are identified in Table 1. Most properties consist of residential structures, although four commercial structures are included. No linear resources were inventoried or evaluated. Construction dates range from the 1920s to the 1940s.

Table 1
Historical Structures Evaluated Near Inland Empire Energy Center Project

address	Description	Date of Construction	Appears Eligible	Appears Not Eligible
25626 Antelope Road	Single Family Residence	1923	X	
27580 Matthews Road	Single Family Residence	1944		X
27601 Monroe Avenue	Single Family Residence	1944		X
27645 Van Buren Avenue	Single Family Residence	1940s		X
27762 Matthews Road	Commercial Misc.	1945		X
27776 Matthews Road	Single Family Residence / Commercial Misc.	1940s		X
27912 Ethanac Road	Single Family Residence	1936		X
27924 Matthews Road	Auto Repair Shop	1923		X
27969 Monroe Avenue	Single Family Residence	1944		X
28050 Matthews Road	Single Family Residence	1923	X	
28062 Matthews Road	Commercial / Residential	1923		X
28068 Highway 74	Single Family Residence	1920s		X
28080 Matthews Road	Single Family Residence	1920s		X
Between 28068 and 28080 Matthews Road	Single Family Residence	1920s		X
East of 28080 Matthews Road	Single Family Residence	1940s		X

Native American Contacts

The Applicant contacted the Native American Heritage Commission (NAHC) on June 8, 2001 to obtain a list of Native Americans to be contacted for the project area. The NAHC provided names of contacts for Riverside County. On July 3, 2001, the Applicant sent letters to these individuals which described the project and asked about concerns. No responses were received. The NAHC searched its sacred lands file and found no listings for the project area (Calpine 2001a: 5.16-11).

CATEGORIZATION OF IDENTIFIED CULTURAL RESOURCES

Various laws apply to the treatment of cultural resources. These laws require the Energy Commission to categorize cultural resources by determining whether they meet sets of specified criteria. These categories then in turn influence the analysis of potential impacts to the cultural resources and the methods and consultation required to mitigate any such impacts. Federal laws apply when a federal agency takes an action. The federal agency will comply with the applicable federal laws. No federal agency has been identified that will take an action for this proposed power plant. If a federal agency is required to take an action, they are responsible for compliance with federal regulations.

Under federal law, only historical or prehistoric sites, objects, or features, or architectural resources that are assessed as "significant" in accordance with federal guidelines need to be considered in analyzing potential impacts. The significance of historical and prehistoric cultural resources is based on the criteria for eligibility for nomination to the NRHP as defined in Title 36 Code of Federal Regulations, section 60.4. If such resources are determined to be significant, and therefore eligible for listing in the NRHP they are afforded certain treatment under the National Historic Preservation Act. If the resources are determined significant, and therefore eligible for the CRHR, then mitigation measures are implemented under CEQA to reduce the impact to less than significant if possible. Federal agencies are responsible for meeting the requirements of NHPA and the Energy Commission is responsible for meeting the requirements of CEQA.

The National Register criteria state that "eligible historic properties" are: districts, sites, building, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that:

a) are associated with events that have made a significant contribution to the broad patterns of our history; or

b) that are associated with the lives of persons significant in our past; or

c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

d) that have yielded, or may be likely to yield, information important to history or prehistory. Isolated finds by definition do not meet these criteria.

California has adopted a very similar set of criteria for assessing resources for the California Register of Historical Resources.

Under federal law, cultural resources determined not to be significant, that is, not eligible for National Register listing, are subject to recording and documentation only, and are afforded no further treatment. However, occasionally certain resources, although they may not be assessed as "significant," may nonetheless be of local or regional importance such that mitigation may be warranted regardless of their assessed

significance. Energy Commission staff and involved federal agencies evaluate the survey reports and site records for any known resources located within or adjacent to the project Area of Potential Effects (APE) to determine whether they meet the eligibility criteria.

The record and literature search and the pedestrian surveys of the proposed project APE were conducted to identify the presence of any cultural resources. Where cultural resources were identified, additional evaluation was conducted to determine whether the resources are already listed on, or are potentially eligible for listing on, either the NRHP [36 CFR 800] or the CRHR. The determination of eligibility is made in compliance with the applicable provisions of the National Historic Preservation Act

CEQA Guidelines explicitly require the lead agency (in this case, the Energy Commission) to make a determination of whether a proposed project will affect "historical resources." The guidelines provide a definition for historical resources and set forth a listing of criteria for making this determination. These criteria are the eligibility criteria for the CRHR and are essentially the same as the eligibility criteria for the NRHP. In addition, as with the NRHP, historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. Resources eligible for the CRHR may have less integrity than the resources eligible for the NRHP. If the criteria are met and the resource is determined eligible for the CRHR, the Energy Commission must evaluate whether the project will cause a "substantial adverse change in the significance of the historical resource," which the regulation defines as a significant effect on the environment.

CEQA also contains a section addressing "unique" archeological resources and provides a definition of such resources (Public Resources Code, Section 21083.2). This section establishes limitations on analysis and prohibits imposition of mitigation measures for impacts to archeological resources that are not unique. However, the CEQA Guidelines state that the limitations in this section do not apply when an archeological resource has already met the definition of an historical resource (Title 14, California Code of Regulations, Section 15064.5).

The Applicant's architectural historian has evaluated the 15 properties that are more than 45 years old located within a half mile of the energy center, and from which at least 50 percent of the energy center will be visible. Two of these properties are evaluated as eligible for the California Register of Historical Resources (CRHR). These two properties are 25626 Antelope Road and 28050 Matthews Road.

The property at 25626 Antelope Road is a one story vernacular single family residence built in 1923. The entrance is in the gable end through a porch with a gable roof. This property retains integrity and has been evaluated as eligible under CRHR Criterion A because of its association with the early development of Romoland (Data Response 44: FWEC 2002c). Staff agrees with this evaluation.

The property at 28050 Matthews Road is a one story vernacular single family residence built in 1923. It has a hipped roof with a clipped gable at each end. The entrance is in the center of the non-gabled façade, which has symmetrical fenestration. This property retains integrity and has been evaluated as eligible under CRHR Criterion A because of

its association with the early development of Romoland (Data Response 44: FWEC 2002c). Staff agrees with this evaluation.

ANALYSIS AND IMPACTS

Since project development and construction usually entail surface and subsurface disturbance, the proposed Inland Empire Energy Center Project has the potential to adversely affect both known and unknown cultural resources. Staff has analyzed the potential direct, indirect, and cumulative impacts from the proposed project. Direct impacts are those which may result from the immediate disturbance of resources, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation or demolition. Indirect impacts are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or vandalism due to improved accessibility. Cumulative impacts to cultural resources may occur if increasing amounts of land are cleared and disturbed for the development of multiple projects in the same vicinity as the proposed project.

The potential for the project to cause impacts to cultural resources is related to the likelihood that such resources are present and whether they are actually encountered during project development and construction activities. Although the existence of known cultural resources increases the potential for additional resources, the absence of known resources does not necessarily mean that unknown resources will not be encountered and that impacts will therefore not occur.

PROJECT SPECIFIC IMPACTS

Archaeological Resources

The archaeological inventories for the plant site and linear components did not record any archaeological sites within the project APE. Therefore, staff does not expect impacts to known archaeological resources.

Historical Structures and Infrastructure

The two historical buildings located at 25626 Antelope Road and 28050 Matthews Road and evaluated as eligible for the CRHR will not be physically impacted by construction of the energy center or its associated linear facilities. Construction of the energy center will not materially alter the surroundings (setting) to the point that the properties' historical significance will no longer be conveyed. The energy center will be visible from the back yard of the residence at 25626 Antelope Road, but the character of the properties in this area is reliant primarily on the residential streetscape at the front of the residence. In addition, thick vegetation partially screens the view toward the energy center. The property's architectural character and setting will not be impacted to the extent that its overall integrity would be compromised (Data Response 173: FWEC 2002e). The energy center will be visible from the front of the residence at 28050 Matthews Road, but there is already an asphalt plant between the residence and the site of the energy center. Construction of the energy center will not materially alter the setting, which is already industrial. Construction of the energy center will not cause a significant impact on the setting of either property and will not affect their eligibility.

CUMULATIVE IMPACTS

Because there will be no impacts on known cultural resources as a result of the Inland Empire Energy Center project, there will be no cumulative impacts on cultural resources as a result of the project.

IMPACTS OF FACILITY CLOSURE

The anticipated lifetime of the Inland Empire Energy Center Project is approximately 30 years. Upgrades or modifications made prior to the facility's closure might extend the life of the plant. Closure would be caused by either (1) a natural or manmade disaster or economic difficulty, or (2) planned orderly closure that will occur when the plant becomes economically non-competitive.

PLANNED CLOSURE

At the time of planned closure, all then-applicable LORS will be identified and the closure plan required by the Energy Commission will address compliance with these LORS. Generally, if no additional ground disturbance occurs during closure activities and all conditions of certification have been met, no impacts to cultural resources would be expected. However, actual potential impacts are likely to depend upon the final location of project structures in relation to existing resources, and upon the procedures used for the removal of project structures. Since the spatial relationship between the closure and removal of project structures and sensitive resources cannot be determined at this time, no conclusion can be drawn at this time with respect to the impact of facility closure on cultural resources. The closure plan, when created, will address impacts to cultural resources.

TEMPORARY CLOSURE

A temporary closure should have no impacts on cultural resources as long as no additional lands are needed for the closure. A contingency plan for temporary cessation of operation would be implemented that would ensure compliance with all applicable LORS.

UNEXPECTED PERMANENT CLOSURE

If a site were abandoned, impact to cultural resources would be unlikely because there would be no immediate soil disturbances. Over time, depending on the need to disturb the ground to accomplish project closure and facility removal, some disturbance of known and/or previously unknown cultural resources might result.

COMPLIANCE WITH APPLICABLE LORS

Riverside County has policies and goals for the protection of cultural resources, but has no specific procedures for implementation of CEQA that differ from procedures used by the Energy Commission. Implementation of the mitigation measures recommended in the conditions of certification will ensure compliance with state and local LORS.

MITIGATION

For cultural resources, the preferred method of mitigation is for project construction to avoid areas where cultural resources are known to exist, wherever possible. Often however, avoidance cannot be achieved, and other measures such as surface collection, subsurface testing, and data recovery must be implemented for archaeological resources and documentation must be implemented for historical structures. Mitigation measures are developed to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

APPLICANT'S PROPOSED MITIGATION

Archaeological Resources

The Applicant recommends preparation of a Cultural Resource Monitoring and Mitigation Plan (CRMMP) and designation of a Project Archaeologist. The archaeologist would be available if archaeological materials are discovered during grading. The archaeological material would be evaluated by the project archaeologist and a mitigation plan would be implemented if the resource is evaluated as significant.

The Applicant recommends a worker education program to ensure that buried archaeological resources are recognized by construction crews. Such a program would include information about the kinds of archaeological material that could be encountered and the procedures to be followed if such material is discovered. Any archaeological materials collected during the construction monitoring and mitigation program would be curated at a qualified curation facility.

Historic Architectural Resources

No mitigation measures for historic architectural resources were recommended by the Applicant.

STAFF'S PROPOSED MITIGATION MEASURES

Commission staff concurs with the mitigation measures proposed by the Applicant for archaeological resources would reduce the impacts to less than significant. Staff proposed conditions are consistent with applicants proposed measures, but do not require a CRMMP given the low probability of encountering cultural resources. The applicant's measures are incorporated into staff's proposed Conditions of Certification CUL-1 through CUL-7 presented below.

CONCLUSIONS AND RECOMMENDATION

Although no known archaeological resources will be impacted by the Inland Empire Energy Center Project, there is a low potential to impact buried prehistoric archaeological resources during construction. If the following conditions of certification are properly implemented, the project will comply with applicable laws, ordinances, regulations, and standards for archaeological resources and any impacts will be reduced below a significant level.

Staff recommends that the Commission adopt the following proposed conditions of certification, which incorporate the mitigation measures discussed above.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of ground disturbance, the project owner shall provide the California Energy Commission Compliance Project Manager (CPM) with the name and resume of its Cultural Resources Specialist (CRS), and one alternate CRS, if an alternate is proposed, for approval. The CRS shall be responsible for implementation of all cultural resources conditions of certification.

Protocol:

1. The resume for the CRS and alternate, shall include information that demonstrates that the minimum qualifications specified in the U.S. Secretary of Interior Guidelines, as published by the CFR 36, CFR Part 61 are met. In addition, the CRS shall have the following qualifications.

   a. The technical specialty of the CRS shall be appropriate to the needs of this project and shall include a background in anthropology, archaeology, history, architectural history or a related field.

   b. The background of the CRS shall include at least three years of archaeological or historic, as appropriate, resource mitigation and field experience in California.

   c. The resume shall include the names and phone numbers of contacts familiar with the CRS's work on referenced projects.

2. The CRS may obtain qualified cultural resource monitors (CRM) to monitor as necessary on the project. CRMs shall meet the following qualifications.

   a. A BS or BA degree in anthropology, archaeology, historic archaeology or a related field and one year experience monitoring in California; or

   b. An AS or AA in anthropology, archaeology, historic archaeology or a related field and four years experience monitoring in California; or

   c. Enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historic archaeology or a related field and two years of monitoring experience in California.

3. The project owner shall ensure that the CRS completes any monitoring, mitigation and curation activities necessary to this project and fulfills all the requirements of these conditions of certification. The project owner shall ensure that the CRS obtains additional CRMs, if needed. The project owner shall ensure that the CRS evaluates any cultural resources

that are newly discovered or that may be affected in an unanticipated manner for eligibility to the California Register of Historic Resources (CRHR).

Verification: At least 45 days prior to the start of ground disturbance, the project owner shall submit the name and resume of its CRS and alternate CRS, if an alternate is proposed, to the CPM for review and approval.

At least 10 days prior to a termination or release of the CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval.

At least 20 days prior to ground disturbance, the CRS shall provide a letter naming anticipated CRMs for the project and stating that the identified CRMs meet the minimum qualifications for cultural resource monitoring required by this condition. If additional CRMs are obtained during the project, the CRS shall provide additional letters to the CPM identifying the CRMs and attesting to the CRM's qualifications. The letter shall be provided one week prior to the CRM beginning on-site duties.

At least 10 days, prior to the start of ground disturbance, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources conditions of certification.

CUL-2 Prior to the start of ground disturbance, the project owner shall provide to the CRS, and to the CPM for approval, maps and drawings showing the footprint of the power plant and all linear facilities. Maps will include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1" = 200') for plotting individual artifacts. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS, and to the CPM for approval.

If the footprint of the power plant or linear facilities changes, the project owner shall provide maps and drawings reflecting these changes to the CRS and the CPM. Maps shall identify all areas of the project where ground disturbance is anticipated.

If construction of the project will proceed in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the CPM.

At a minimum, the CRS shall consult weekly with the project superintendent or construction field manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

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

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall provide the CRS and the CPM with the maps and drawings.

If the project is to be phased, the project owner shall also provide to the CRS and CPM a letter identifying the proposed schedule of the ground disturbance or construction phases, and the associated dates for submittal of maps and drawings, along with the initial maps and drawings.

If there are changes to the footprint for a project phase, revised maps and drawings shall be provided to the CRS and CPM at least 15 days prior to start of ground disturbance for that phase. If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within 5 days of identifying the changes.

CUL- 3 Cultural resource monitoring shall be conducted during the initial groundbreaking at the plant site. The potential for encountering buried deposits shall be assessed by the CRS based on the initial groundbreaking observations. The initial assessment shall prescribe the type (intermittant to full time) and duration for monitoring of ground disturbance within the plant site.

The cultural resource monitoring shall continue until the CRS determines that no cultural resources will be impacted.

Monitors shall keep a daily log of any monitoring or cultural resource activities and the CRS shall prepare a weekly summary report on the progress or status of cultural resources-related activities. The CRS may informally discuss cultural resource monitoring and mitigation activities with Energy Commission technical staff.

The CRS shall notify the project owner and the CPM, by telephone or e-mail, of any incidents of non-compliance with any cultural resources conditions of certification within 24hours of becoming aware of the situation. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the conditions of certification.

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

A Native American monitor shall be obtained to monitor ground disturbance in areas where Native American artifacts are discovered. Informational lists of concerned Native Americans and guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that will be monitored.

Verification: Within 5 days after the initial groundbreaking, the CRS or alternate CRS will provide a letter (electronic or paper) to the CPM for approval, and to the

project owner, describing the initial groundbreaking observations, including the type (intermittant to full time) and duration of cultural resources monitoring.

During the ground disturbance phases of the project, the project owner shall include in the Monthly Compliance Report (MCR) copies of the weekly summary reports prepared by the CRS regarding project-related cultural resources monitoring. Copies of daily logs shall be retained and made available for audit by the CPM as needed.

Within 24 hours of recognition of a non-compliance issue, the CRS shall notify the CPM by telephone of the problem and of steps being taken to resolve the problem. The telephone call shall be followed by an e-mail or fax detailing the non-compliance issue and the measures necessary to achieve resolution of the issue. Daily logs shall include forms detailing any instances of non-compliance with conditions of certification. In the event of a non-compliance issue, a report written no sooner than two weeks after resolution of the issue that describes the issue, resolution of the issue and the effectiveness or the resolution measures, shall be provided in the next MCR.

When Native American artifacts are found, the project owner shall send notification to the CPM identifying the person(s) retained at a minimum, an on an on-call basis to conduct Native American monitoring. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM who will initiate a resolution process

CUL-4 The CRS shall prepare, and the project owner shall submit a Cultural Resources Report (CRR) to the CPM for approval. The CRR shall report on all field activities including dates, times and locations, findings, samplings and analysis. All survey reports, DPR 523 forms and additional research reports not previously submitted to the California Historic Resource Information System (CHRIS) shall be included as an appendix to the CRR.

Verification: The project owner shall submit the CRR to the CPM within 90 days after completion of ground disturbance (including landscaping). Within 10 days after CPM approval, the project owner shall provide documentation to the CPM that copies of the CRR have been provided to the curation facility (if archaeological materials were collected), the State Historic Preservation Office (SHPO) and the CHRIS.

CUL-5 A worker Environmental Awareness Program (WEAP) shall be provided, on a weekly basis, to all new employees starting prior to the beginning and for the duration of ground disturbance. The training may be presented in the form of a video. The training shall include:

1. a discussion of applicable laws and penalties under the law;

2. samples or visuals of artifacts that might be found in the project vicinity;

3. information that the CRS, alternate CRS or CRM has the authority to halt construction in the event of a discovery or unanticipated impact to a cultural resource;

4. instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the CRS or CRM;

5. an informational brochure that identifies reporting procedures in the event of a discovery;

6. an acknowledgement form signed by each worker indicating that they have received the training;

7. and a sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification: The project owner shall provide in the Monthly Compliance Report the WEAP Certification of Completion form of persons who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-6 The CRS, alternate CRS, and the CRMs shall have the authority to halt or redirect construction if previously unknown cultural resource sites or materials are encountered or if known resources may be impacted in a previously unanticipated manner.

If such resources are found, the halting or redirection of construction shall remain in effect until all of the following have occurred:

a. the CRS or CRM has notified the project owner, and the CPM has been notified within 24 hours of the find and the work stoppage;

b. the CRS, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed; and

c. any necessary data recovery and mitigation has been completed.

Verification: At least thirty days prior to the start of ground disturbance, the project owner shall provide the CPM with a letter confirming that the CRS, alternate CRS, and CRMs have the authority to halt construction activities in the vicinity of a cultural resource find and stating that the CRS will notify the CPM immediately (no later than the morning following the incident, or Monday morning in the case of a weekend) of any halt of construction activities, including the circumstance and proposed mitigation measures.

CUL-7 Following the filing of the CPM-approved CRR with curation facility and the appropriate agencies described in CUL-4, the project owner shall ensure that all cultural resource materials, maps and data collected during data recovery and mitigation are delivered to the curation facility (that meets the U.S. Secretary of Interior requirements for the curation of cultural resources). The project owner shall pay any required curation fees.

Verification: The project owner shall ensure that all recovered cultural resource materials are delivered for curation within thirty days after filing the CPM-approved CRR.

For the life of the project, the project owner shall maintain in its compliance files copies of signed contracts or agreements with the curation facility.

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HAZARDOUS MATERIALS MANAGEMENT

Alvin J. Greenberg, Ph.D. and Rick Tyler

INTRODUCTION

The purpose of this Preliminary Staff Assessment is to determine if the proposed Inland Empire Energy Center (IEEC) has the potential to cause significant impact on the public as a result of the use, handling or storage of hazardous materials at the proposed facility. If significant adverse impacts on the public are identified, Energy Commission staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce impacts to the extent feasible.

This analysis does not address potential exposure of workers to hazardous materials used at the proposed facility. Employers must inform employees of hazards associated with their work and thus employees accept a higher level of risk than the general public as a condition of employment. Workers are thus not afforded the same level of protection normally provided to the public. Further, workers can be provided with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials. Staff's **Worker Safety and Fire Protection** analysis also describes the requirements applicable to the protection of workers from such risks.

There are two acutely hazardous materials stored at the IEEC in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j), aqueous ammonia (28 percent ammonia in aqueous solution) and sulfuric acid (93% and 29.5% solutions). (See Table 3.4-7 of the Application for Certification, Calpine 2001a). It is staff's opinion that aqueous ammonia presents the greatest potential for off-site consequences. However, the use of aqueous ammonia significantly reduces the risk that would otherwise be associated with use of the more economical anhydrous form of ammonia. Use of the aqueous form eliminates the high internal energy associated with the more hazardous anhydrous form, which is stored as a liquefied gas at elevated pressure. The high internal energy associated with the anhydrous form of ammonia can act as a driving force in an accidental release, which can rapidly introduce large quantities of the material to the ambient air and result in high down-wind concentrations. Spills associated with the aqueous form are much easier to contain and emissions are limited by the slow mass transfer from the surface of the spilled material.

Sulfuric acid poses little threat of off-site impact in 93% or 29.5% solutions as a result of its very low vapor pressure. It is staff's conclusion that impacts from a spill of sulfuric acid would be confined to the facility.

Other hazardous materials stored in smaller quantities, such as mineral and lubricating oils, corrosion inhibitors and water conditioners, will be present at the proposed facility. Hazardous materials used during the construction phase include gasoline, diesel fuel, oil, welding gases, lubricants, solvents and paint. No acutely toxic hazardous materials will be used onsite during construction. None of these materials pose significant potential for off-site impacts as a result of the quantities on-site, their relative toxicity, and/or their environmental mobility. Although no natural gas is stored, the project will

also involve the construction and operation of a natural gas pipeline and handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion. This pipeline would be 0.9 miles in length and would involve the construction and operation of a new compressor station.

The IEEC will also require the transportation of aqueous ammonia to the facility. Analysis of the potential for impact associated with such deliveries is addressed below.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal, state, and local laws and policies apply to the protection of public health and hazardous materials management. Staff's analysis examines the project's compliance with these requirements.

FEDERAL

The Superfund Amendments and Reauthorization Act of 1986 (42 USC §9601 et seq.), contains the Emergency Planning and Community Right To Know Act (also known as SARA Title III). The Clean Air Act (CAA) of 1990 (42 USC 7401 et seq. as amended) established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The CAA section on Risk Management Plans - codified in 42 USC §112(r) - requires 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 both SARA Title III and the CAA are reflected in the California Health and Safety Code, section 25531 et seq. Due to the petroleum-containing hazardous materials that will be used on this site, a Spill Prevention Control and Countermeasure Plan (SPCC) is required by Federal Regulations (Hazardous Waste Contingency Plan Title 40, Part 112.7).

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, 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.

Title 8, California Code of Regulations, Section 458 and Sections 500 –to 515, set forth requirements for design, construction and operation of vessels and equipment used to store and transfer ammonia. These sections generally codify the requirements of several industry codes, including the ASME Pressure Vessel Code, ANSI K61.1 and the National Boiler and Pressure Vessel Inspection Code. These codes apply to anhydrous ammonia but are also used to design storage facilities for aqueous ammonia.

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."

There are additional State LORS that apply to locating schools near sources of toxic air contaminant emissions, hazardous materials, and industries with potential chemical or explosion risks but which do not apply to the siting of these sources near a school that is already present. Although these regulations do not apply to the siting of a gas-fired power plant within the State of California, prudence dictates that these regulations be listed here and their intent considered because these regulations were adopted by the Legislature to protect school children. California Code of Regulations, Title 5 (School Facilities Construction) Section 1410 requires that schools not be located near an above-ground water or fuel storage tank or within 1500 feet of the easement of an above ground or underground pipeline that can pose a safety hazard as determined by a risk analysis study. Title 5 also includes a requirement that projects involving the purchase or construction of school sites identify facilities within one-fourth mile of the site which may emit hazardous air emissions. This information along with test results and an analysis of the potential hazard to students and staff is required to be submitted with the Geological Hazards Report required by Education Code sections 17212 and 17212.5 to the California Department of Education.

Gas Pipeline

The safety requirements for pipeline construction vary according to the population density and land use, which characterize the surrounding land. The pipeline classes are defined as follows (Title 49, Code of Federal Regulations, Part 192):

- Class 1: Pipelines in locations with ten or fewer buildings intended for human occupancy.
- Class 2: Pipelines in locations with more than ten but fewer than 46 buildings intended for human occupancy. This class also includes drainage ditches of public roads and railroad crossings.
- Class 3: Pipelines in locations with more than 46 buildings intended for human occupancy, or where the pipeline is within 100 yards of any building or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12 month period (The days and weeks need not be consecutive).

The natural gas pipeline will be designed for Class 3 service and will meet California Public Utilities Commission General Order 112-E and 58-A standards as well as various

PG&E standards. The natural gas pipeline must be constructed and operated in accordance with the Federal Department of Transportation (DOT) regulations, Title 49, Code of Federal Regulations (CFR), Parts 190, 191, and 192:

- Title 49, Code of Federal Regulations, Part 190 outlines the pipeline safety program procedures;
- Title 49, Code of Federal Regulations, Part 191, Transportation of Natural and Other Gas by Pipeline; Annual Reports, Incident Reports, and Safety-Related Condition Reports, requires operators of pipeline systems to notify the U.S. Department of Transportation of any reportable incident by telephone and then submit a written report within 30 days;
- Title 49, Code of Federal Regulations, Part 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, specifies minimum safety requirements for pipelines and includes material selection, design requirements, and corrosion protection. The safety requirements for pipeline construction vary according to the population density and land use which characterize the surrounding land. This part contains regulations governing pipeline construction, which must be, followed for Class 2 and Class 3 pipelines.

LOCAL AND REGIONAL

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials in Articles 79 and 80. The latest revision to Article 80 was in 1997 (Uniform Fire Code, 1997) and includes 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. A further discussion of these requirements is provided in the **Geology and Mineral Resources** section of this document.

The Certified Unified Program Authority (CUPA) with responsibility to review RMPs and Hazardous Materials Business Plans is the Riverside County of Environmental Health Department. A Consolidated Hazardous Materials Permit from the County will be required.

SETTING

The proposed site is located on approximately 45.8 acres located near the City of Romoland in unincorporated Riverside County. The site is located between Ethanac Road to the north and McLaughlin Road to the south with Antelope Road on its western boundary. The site is cultivated agricultural land currently used for growing wheat. The site topography is flat with an elevation of about 1,445 feet above sea level. The closest residential area lies approximately 200 yards north of the site's northern boundary. The closest school is located approximately 0.34 miles (~360 meters or 1181 feet) north of the proposed IEEC site. The unincorporated regions of Riverside County are rapidly

growing, including the region of this proposed project. For a more complete discussion of this subject, please refer to staff's assessment section on **Land Use**.
Several factors associated with the area in which a project is to be located affect its potential to cause public health impacts from an accidental release of a hazardous material. These include:

- local meteorology;
- terrain characteristics; and
- location of population centers and sensitive receptors relative to the project.

METEOROLOGICAL CONDITIONS

Meteorological conditions, including wind speed, wind direction and air temperature, affect the extent to which accidentally released hazardous materials would be dispersed into the air and the direction in which they would be transported. This affects the potential magnitude and extent of public exposure to such materials as well as the associated health risks. When wind speeds are low and the atmosphere is stable, dispersion is severely reduced and can lead to increased localized public exposure.

Recorded wind speeds and ambient air temperatures are described in the Air Quality section (5.2) of the AFC. Staff agrees with the applicant that use of F stability (stagnated air, very little mixing) and 1.5 meter per second wind speed is appropriate for conducting the Offsite Consequence Analysis. Staff believes these represent a reasonably conservative scenario and thus reflects worst case atmospheric conditions.

TERRAIN CHARACTERISTICS

The location of elevated terrain (terrain above the power plant stack height) is often an important factor to be considered in assessing potential exposure. An emission plume resulting from an accidental release may impact high elevations before impacting lower elevations. The terrain is mostly flat in the project vicinity. To the north-northwest of the project site the Perris Valley extends for 12 miles to the March Air Reserve Base. Ranges of hills rise in all other directions from the project site.

LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses. In addition, the location of the population in the area surrounding a project site may have a large bearing on health risk. Figure 5.15-2 and Table 5.15-1 (AFC) show and list the location of sensitive receptors in the project vicinity. The two closest sensitive receptors are located approximately 0.34 miles north of the proposed IEEC site (Romoland Head Start Daycare and Romoland Elementary School). A proposal exists to locate a grade school approximately 800 feet to the west of the proposed IEEC site on the edge of a new community yet to be developed.

IMPACTS AND ANALYSIS

Staff thoroughly reviewed and assessed the potential for the transportation, handling, and use of hazardous materials to impact the surrounding community. All chemicals and natural gas were evaluated.

METHODOLOGY

In order to assess the potential for released hazardous materials to travel off-site, and impact on the public, staff analyzed several aspects of the proposed use of these materials at the facility. Staff recognizes that some hazardous materials must be used at power plants. Therefore, staff conducted its analysis by examining the choice of chemical to be used and the amount, the manner in which the applicant will use the chemical, the manner it will be transported to the facility and transferred to facility storage tanks, and the way the applicant chooses to store the material on-site.

Staff reviewed the applicant's proposed engineering controls and administrative controls concerning hazardous materials usage. Engineering controls are those physical or mechanical systems (such as storage tanks or automatic shut-off valves) which can prevent a spill of hazardous material from occurring or which can limit the spill to a small amount or confine it to a small area. Administrative controls are those rules and procedures that workers at the facility must follow that will help to prevent accidents or keep them small if they do occur. Both engineering and administrative controls can act as methods of prevention or as methods of response and minimization. In both cases, the goal is to prevent a spill from moving off-site and causing harm to the public.

Staff conducted a thorough review and evaluation of the applicant's proposed use of hazardous materials as described by the applicant in the AFC (Section 5.12). Staff's assessment followed the five steps listed below:

- Step 1: Staff reviewed the chemicals and the amounts proposed for on-site use as listed in Tables 3.4-7 of the AFC and determined the need and appropriateness of their use.
- Step 2: Those chemicals, proposed for use in small amounts or whose physical state is such that there is virtually no chance that a spill would migrate off the site and impact the public, were removed from further assessment.
- Step 3: Measures proposed by the applicant to prevent spills were reviewed and evaluated. These included engineering controls such as automatic shut-off valves and different size transfer-hose couplings and administrative controls such as worker training and safety management programs.
- Step 4: Measures proposed by the applicant to respond to accidents were reviewed and evaluated. These measures also included engineering controls such as catchment basins and methods to keep vapors from spreading and administrative controls such as training emergency response crews.
- Step 5: Staff analyzed the theoretical impacts on the public worst-case spill of hazardous materials even with the mitigation measures proposed by the Applicant. When mitigation methods proposed by the applicant are sufficient, no further mitigation is recommended. If the proposed mitigation is not sufficient to reduce the

potential for adverse impacts to an insignificant level, staff will propose additional prevention and response controls until the potential for causing harm to the public is reduced to an insignificant level. It is only at this point that staff can recommend that the facility be allowed to use hazardous materials.

PROJECT IMPACTS

Small Quantity Hazardous Materials

In conducting the analysis, staff determined in Steps 1 and 2 that some materials, although present at the proposed facility, pose a minimal potential for off-site impacts as they will be stored in a solid form or in smaller quantities have low mobility or have low levels of toxicity. These hazardous materials were eliminated from further consideration.

During the construction phase of the project, the only hazardous materials proposed for use include paint, paint thinner, cleaners, solvents, sealants, gasoline, diesel fuel, motor oil, hydraulic fluid, welding flux and gases, lubricants and emergency refueling containers. Any impact of spills or other releases of these materials will be limited to the site due to the small quantities involved. Fuels such as fuel oil #6, mineral oil, lube oil, and diesel fuel are all of very low volatility and represent limited off-site hazard even in larger quantities.

The use of hydrogen gas poses a risk of explosion. However, the moderate quantity present indicates that any blast effect will be confined to the site and not significantly impact off-site. As a further precaution, staff requested that the Applicant relocate the hydrogen storage to the southern portion of the IEEC, thus increasing its distance from Romoland School. The Applicant agreed and has submitted a revised figure 56-1 (from Response to Data Request #56) that shows the new location (FWEC 2002d). In addition, Condition of Certification **HAZ- 9** will ensure that the Applicant will store the hydrogen cylinders in an area isolated from combustion sources. The tanks and piping that are near potential traffic hazards will be protected from vehicle impact by traffic barriers.

After removing from consideration those chemicals that pose no risk of off-site impact in Steps 1 and 2, staff continued with Steps 3, 4, and 5 to review the remaining hazardous materials.

Large Quantity Hazardous Materials

Sulfuric acid, cyclohexylamine, sodium hydroxide and sodium hypochlorite will be stored on site but do not pose a risk of off-site impacts because they have relatively low vapor pressures and thus spills would be confined to the site. In the case of cyclohexlamine, the quantity is low (below the Threshold Level for reporting) thus limiting further any potential for impact. In the case of hydrochloric acid, its infrequent use and standard precautions taken during its use reduce the risk of an off-site impact to an insignificant level. Because of public concern at another proposed energy facility in 1995, staff conducted a quantitative assessment of the potential for impact associated with sulfuric acid use, storage, and transportation. Staff found no hazard would be posed to the public due to the extremely low volatility of this aqueous solution of sulfuric acid.

However, in order to protect against risk of fire, staff is proposing Condition of Certification **HAZ-5** that would require that the project owner to ensure that no combustible or flammable material is stored within 100 feet of the sulfuric acid tank.

Natural Gas

Natural gas poses a fire and/or explosion risk as a result of its flammability. Natural gas is composed of mostly methane but also contains ethane, propane, nitrogen, butane, isobutane and isopentane. It is colorless, odorless, and tasteless and is lighter than air. Natural gas can cause asphyxiation when methane is ninety percent in concentration. Methane is flammable when mixed in air at concentrations of 5 to 14 percent, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or explosions if a release were to occur. However, it should be noted that, due to its tendency to disperse rapidly (Lees 1998), natural gas is less likely to cause explosions than many other fuel gases, such as propane or liquefied petroleum gas.

While natural gas will be used in significant quantities, it will not be stored on-site. The risk of a fire and/or explosion on-site can be reduced to insignificant levels through adherence to applicable codes and development and implementation of effective safety management practices. In particular, gas explosions can occur in the Heat Recovery Steam Generator (HRSG) and during start-up. The National Fire Protection Association (NFPA 85A) requires 1) the use of double block and bleed valves for gas shut-off; 2) automated combustion controls; and 3) burner management systems. These measures will significantly reduce the likelihood of an explosion in gas-fired equipment. Additionally, start-up procedures will require air purging of the gas turbines prior to start-up, thus precluding the presence of an explosive mixture. The safety management plan proposed by the applicant will address the handling and use of natural gas and significantly reduce the potential for equipment failure due to improper maintenance or human error.

Since the proposed facility will require the installation of a new gas pipeline off-site, impacts from this pipeline need to be evaluated. The design of the natural gas pipeline is governed by laws and regulations discussed here. These LORS require use of high quality arc welding techniques by certified welders and inspection of welds. Many failures of older natural gas lines have been associated with poor quality welds or corrosion. Current codes address corrosion failures by requiring use of corrosion resistant coatings and cathodic corrosion protection. Another major cause of pipeline failure is damage resulting from excavation activities near pipelines. Current codes address this mode of failure by requiring clear marking of the pipeline route. An additional mode of failure particularly relevant to the project area is damage caused by earthquake. Existing codes also address seismic hazard in design criteria (see discussion below). Evaluation of pipeline performance in recent earthquakes indicates that pipelines designed to modern codes perform well in seismic events while older lines frequently fail. Staff believes that existing regulatory requirements are sufficient to reduce the risk of accidental release from the pipeline to insignificant levels.

Failures of gas pipelines, according to data from the U.S. Department of Transportation (the National Transportation Safety Board) from the period 1984 - 1991, occur as a result of pipeline corrosion, pipeline construction or materials defects, rupture by heavy

equipment excavating in the area such as bulldozers and backhoes, weather effects, and earthquakes. Given the gas line failures which occurred in the Marina District of San Francisco during the 1989 Loma Prieta earthquake, the January 1994 Northridge earthquake in Southern California, and the January 1995 gas pipeline failures in Kobe, Japan, as well as the January 19, 1995 gas explosion in San Francisco, the safety of the gas pipeline is of paramount importance. However, it must be noted that those pipelines that failed were older and not manufactured nor installed to modern code requirements. The February 2001 Nisqually Earthquake near Olympia Washington caused no damage to natural gas mains and there was only one reported gas line leak due to a separation of a service line going into a mobile home park.

The natural gas pipeline proposed for the facility will be installed, owned, and operated by the applicant. If release of gas occurs as a result of pipe, valve, or other mechanical failure or external forces, significant quantities of compressed natural gas could be released rapidly. Such a release can result in a significant fire and/or explosion hazard, which could cause loss of life and/or significant property damage in the vicinity of the pipeline route. However, the probability of such an event is extremely low if the pipeline is constructed according to present standards.

According to DOT statistics, the frequency of reportable incidents is about 0.25 for all pipeline incidents per 1,000 miles per year or 2.5×10^{-4} incidents per mile per year. DOT has also evaluated and categorized the major causes of pipeline failure. The four major causes of accidental releases from natural gas pipelines are outside forces (43 percent), corrosion (18 percent), construction/material defects(13 percent). Other causes, including equipment component failure, compressor station failures, operator errors and sabotage, account for 26 percent of the accidental releases.

Outside forces are the primary causes of incidents. Damage from outside forces includes damage caused by use of heavy mechanical equipment near pipelines (e.g., bulldozers and backhoes used in excavation activities), weather effects, vandalism, and earthquake-caused rupture as seen in the Marina District of San Francisco during the 1989 Loma Prieta Quake and in Kobe, Japan in January 1995. The average annual service incident frequency for natural gas transmission systems varies with age, the diameter of the pipeline, and the amount of corrosion.

Older pipelines have a significantly higher frequency of incidents. This results from the lack of corrosion protection and use of less corrosion resistant materials compared to modern pipelines, limited use of modern inspection techniques when the pipelines were constructed, and higher frequency of incidents involving outside forces. The increased incident rate due to outside forces is the result of the use of a larger number of smaller diameter pipelines in older systems, which are generally more easily damaged, and the uncertainty regarding the locations of older pipelines.

In the United States, extensive federal and state pipeline codes and safety enforcement minimize the risk of severe accidents related to natural gas pipelines. In November 2000, the DOT Office of Pipeline Safety proposed a program requiring the preparation of risk management plans for gas pipelines throughout the United States. These risk management plans will include the use of diagnostic techniques to detect internal and

external corrosion or cracks in pipelines and to perform preventive maintenance. The project owner will be required to develop and implement these plans if the proposal is promulgated as a regulation.

Staff believes the worst case scenario for off-site natural gas hazard is a large rupture of the pipeline caused by improper use of heavy equipment near the pipeline. The applicant will provide an analysis of the likelihood (which is thought to be very low) of explosion and fire resulting from sparks generated from heavy equipment rupture of the pipeline if the DOT proposal for a pipeline risk management plan becomes regulation. This worst case scenario would not result in significant asphyxiation hazard since natural gas disperses to the atmosphere rapidly when released. The worst case scenario is primarily a safety hazard to construction workers. There are few nearby residences. The project owner will mark the pipeline in conformance with State and Federal regulations to lower the probability the above scenario.

The following safety features will be incorporated into the design and operation of the natural gas pipeline, as required by current federal and state codes: (1) while the pipeline will be designed, constructed, and tested to carry natural gas at a certain pressure, the working pressure will be less than the design pressure; (2) butt welds will be X-rayed and the pipeline will be tested with water prior to the introduction of natural gas into the line; (3) the pipeline will be surveyed for leakage annually; (4) the pipeline will be marked to prevent rupture by heavy equipment excavating in the area; and (5) valves at the meter will be installed to isolate the line if a leak occurs.

Aqueous Ammonia

Aqueous ammonia and natural gas are the only hazardous materials that may pose a risk of off-site impacts. Aqueous ammonia will be used in controlling the emission of oxides of nitrogen (NO_x) from the combustion of natural gas in the facility. The accidental release of aqueous ammonia without proper mitigation can result in very high down-wind concentrations of ammonia gas. Two storage tanks will be used to store the 28% aqueous ammonia with a maximum capacity of 16,000 gallons each.

The use of aqueous ammonia can result in the formation and release of toxic gases in the event of a spill even without interaction with other chemicals. This is a result of its moderate vapor pressure and the large amounts of aqueous ammonia which will be used and stored on-site. However, the use of aqueous ammonia poses far less risk than would the use of the much more hazardous anhydrous ammonia (i.e. ammonia that is not diluted with water).

To assess the potential impacts associated with an accidental release of ammonia, staff typically evaluates where four “bench mark” exposure levels of ammonia gas occur off-site. These include: 1) the lowest concentration posing a risk of lethality, 2,000 ppm; 2) the Immediately Dangerous to Life and Health (IDLH) level of 300 ppm; 3) the Emergency Response Planning Guideline (ERPG) level 2 of 150 ppm (recently changed from 200 ppm), which is also the RMP level 1 criterion used by EPA and California; and 4) the level considered by the Energy Commission staff to be without serious adverse effects on the public for a one-time exposure of 75 ppm. (A detailed discussion of the exposure criteria considered by staff and their applicability to different populations and exposure-specific conditions is provided in Appendix A of this analysis.) If the potential

exposure associated with a potential release exceeds 75 ppm at any public receptor, staff will presume that the potential release poses a risk of significant impact. However, staff will also assess the probability of occurrence of the release and/or the nature of the potentially exposed population in determining whether the likelihood and extent of potential exposure are sufficient to support a finding of potentially significant impact.

Section 5.12.2 of the AFC and Applicant's revised response to Data Request number 53 (FWEC 2002d) describe the modeling parameters used for the worst case and alternative case accidental releases of aqueous ammonia. The worst-case release is associated with a failure of the ammonia storage tank releasing all of its contents into the secondary containment area, and the alternative scenario is a failure of a supply truck loading hose spilling a maximum of 33 gallons of aqueous ammonia (double the contents of the transfer hose) onto the truck unloading pad with flow to the capture sump. In conducting the first scenario analysis, it is assumed that spilled material would be contained in the basin below the storage tank. In conducting the second scenario, it was assumed that the 33 gallons of aqueous ammonia flowed slowly into the subsurface sump and thus included emissions from a pool on the pad as well as from the sump. In addition, winds of 1.5 meter per second and category F stability are assumed at the time of the accidental release. The SLAB air dispersion model was used to estimate airborne concentrations of ammonia. This model is designed to predict the maximum possible impacts based on distance from the storage tank without regard to specific direction of transport. The SLAB model is one of several approved by the US EPA for use in this type of assessment.

The results of the applicant's modeling showed that off-site airborne concentrations of ammonia would not exceed the level the CEC uses to establish insignificance (75 ppm) at any off-site location. For the worst-case scenario, a concentration of less than 1 ppm was predicted to occur at the fenceline, a distance of about 100 feet from the aqueous ammonia storage tank. For the alternative scenario, a concentration of 26 ppm was predicted to occur at the fenceline, a distance of about 140 feet from the loading area (FWEC 2002d, Table 53-3). This modeling also estimated that the airborne concentration of ammonia at the Romoland School would be less than 1 ppm, a level that presents no hazard to even sensitive asthmatic children and which would not be detectable by the sense of smell.

Staff reviewed the applicants modeling calculations, and conducted independent SLAB modeling. Staff's results confirmed the accuracy of the applicant's modeling and found that the distance to the CEC Level of Concern (75 ppm) would be 23-27 meters (75 - 88 feet) from the storage tanks (worst case scenario) and that 75 ppm would not be reached except in the spill area for the transportation accidental release (alternative scenario). Staff's results also confirmed that the modeled airborne concentration of ammonia at the Romoland School would be less than 1 ppm. Staff therefore finds that due to the engineering controls proposed to be implemented by the applicant for the storage and transfer of aqueous ammonia, any accidental release of aqueous ammonia used for the project will not cause a significant impact.

Transportation of Hazardous Materials

The transportation of hazardous materials to the facility is usually of great concern to the residents and workers in the surrounding community. Hazardous materials,

including aqueous ammonia, sodium hypochlorite, and others will be transported to the facility via tanker truck. While many types of hazardous materials will be transported to the site, it is staff's belief that transport of aqueous ammonia poses the predominant risk associated with hazardous materials transport.

Staff reviewed the Applicant's proposed transportation routes for hazardous materials delivery (Calpine 2001a, Section 5.11.1.8). Aqueous ammonia would be delivered to the facility by tanker truck and thus it is possible that ammonia can be released during a transportation accident. The extent of impact in the event of such a release would depend on the location and on the rate of dispersion of ammonia vapor from the surface of the aqueous ammonia pool. The likelihood of an accidental release during transport is dependent on three factors:

- the skill of the tanker truck driver,
- the type of vehicle used for transport, and
- accident rates.

To address this concern, staff evaluated the risk of an accidental transportation release in the project area. Staff's analysis focused on the project area after the delivery vehicle leaves the main highway (Interstate 215), which is listed by the California Highway Patrol as a hazardous material transportation route. Staff believes that it is appropriate to rely on the extensive regulatory program that applies to shipment of hazardous materials on California Highways to ensure safe handling in general transportation (see The Federal Hazardous Materials Transportation Law 49 USC §5101 et seq, The US Department of Transportation Regulations 49 CFR Subpart H, §172-700, and California DMV Regulations on Hazardous Cargo). These regulations also address the issue of driver competence. (See AFC section 7.4.11 for additional information on regulations governing the transportation of hazardous materials.)

To address the issue of tank truck safety, aqueous ammonia will be delivered to the proposed facility in Department of Transportation (DOT) certified vehicles with design capacity of 8,000 gallons. These vehicles will be designed to DOT Code MC-307. These are high integrity vehicles designed for hauling of caustic materials such as ammonia. Staff has therefore proposed a Condition of Certification (**HAZ-8**) to ensure that regardless of which vendor supplies the aqueous ammonia, delivery will be made in a tanker, which meets or exceeds the specifications described by these regulations.

To address the issue of accident rates, staff reviewed the technical and scientific literature on hazardous materials transportation (including tanker trucks) accident rates in the United States and California. Staff relied on the following references to determine the approach to preparing a hazardous materials transportation accident risk analysis:

Rhyne, W.R. 1994. Hazardous Materials Transportation Risk Analysis. Quantitative Approaches for Truck and Train.

<u>Chapter 2: Transportation Quantitative Risk Analysis</u>
<u>Chapter 3: Databases</u>

Davies, P.A. and Lees, F.P. 1992. “The Assessment of Major Hazards: The Road Transport Environment for Conveyance of Hazardous Materials in Great Britain.” Journal of Hazardous Materials, 32: 41-79.

Harwood, D.W., Viner, J.G., and E.R. Russell. 1990. "Truck Accident Rate Model for Hazardous Materials Routing." Transportation Research Record. 1264: 12-23.

Harwood, D.W., Viner, J.G., and E.R. Russell. 1993. "Procedure for Developing Truck Accident and Release Rates for Hazmat Routing." Journal of Transportation Engineering. 119(2): 189-199.

Vilchez, J.A., Sevilla, S., Montiel, H. and J. Casal. 1995. "Historical Analysis of Accidents in Chemical Plants and in the Transportation of Hazardous Materials." J. Loss Prev. Process Ind. 8(2): 87-96

Pet-Armacost, J.J., Sepulveda, J. and M. Sakude. 1999. "Monte Carlo Sensitivity Analysis of Unknown Parameters in Hazardous Materials Transportation Risk Assessment." Risk Analysis. 19(6): 1173-1184.

National Response Center (accident data base)
Chemical Incident Reports Center, U.S. Chemical Safety Board (data base)
National Transportation Safety Board (data base)

Staff used data from all these sources and in particular from the National Response Center and that from the Davies and Lee (1992) article, which references the 1990 Harwood study, to determine that the frequency of release for transportation of hazardous materials in the U.S. is between 0.06 and 0.19 releases per million miles traveled on well designed roads and highways. The maximum usage of aqueous ammonia each year of operation of the proposed Inland Empire Energy Center will require about 17 tanker truck deliveries of aqueous ammonia per year (maximum of one truck every 3 weeks). Each truck delivery will travel about two miles between Interstate-215 and the facility per delivery along the designated transportation route. The result is 34 miles of delivery truck travel in the project area per year. Previous assessments by staff have found that the risk over this distance is negligible.

Data from the U.S. DOT show that the actual risk of a fatality over the past five years from all modes of hazardous material transportation (rail, air, boat, and truck) was approximately 0.1 in one million.

Staff therefore believes the risk of exposure to significant concentrations of aqueous ammonia during transportation to the facility are insignificant because of the remote possibility of accidental release of a sufficient quantity to present a danger to the public. The transportation of similar volumes of hazardous materials on the nation’s highways is not unique nor an infrequent occurrence. Staff’s analysis of the transportation of aqueous ammonia to the proposed facility (along with data from the U.S. DOT) demonstrates that the risk of accident and exposure is less than significant.

Based on the environmental mobility, toxicity, quantities present at the site and frequency of delivery, it is staff’s opinion that aqueous ammonia poses the predominate

risk associated with hazardous materials transportation and use at the proposed facility. Based on this, staff concludes that the risk associated with transportation of other hazardous materials to the proposed facility does not significantly increase the risk of impact beyond that associated with ammonia transportation.

Staff also finds that restricting the route and hours of transportation would be important in keeping the risks of accidents to negligible levels. Accordingly, staff proposes Conditions of Certification (**HAZ-10** & **11**) that require the applicant to inform hazardous material vendors to use only the approved transportation route (I-215 to Ethanac Road to Antelope Road and then into the facility), obtain approval from the CPM if an alternate route is requested, and not deliver during hours of the day when children are going to and from school.

Seismic Issues

The possibility exists that an earthquake would cause the failure of a hazardous materials storage tank and rupture of the natural gas pipeline. The quake could also cause the failure of the secondary containment system (berms and dikes) as well as electrically controlled valves, pumps, neutralization systems and the foam vapor suppression system. The failure of all these preventive control measures might then result in a vapor cloud of hazardous materials moving off-site and impacting the residents and workers in the surrounding community. The effects of the Loma Prieta earthquake of 1989, the Northridge earthquake of 1994, and the earthquake in Kobe, Japan, in January 1995 heighten the concern regarding earthquake safety .

Information obtained after the January 1994 Northridge earthquake showed that some damage was caused to several large storage tanks and smaller tanks associated with the water treatment system of a cogeneration facility. Those tanks with the greatest damage - including seam leakage - were older tanks while the newer tanks sustained displacements and failures of attached lines. Therefore, staff conducted an analysis of the codes and standards that should be followed in adequately designing and building storage tanks and containment areas as well as the natural gas pipeline to withstand a large earthquake. Staff recommends that the proposed facility be designed and constructed to the applicable standards of the Uniform Building Code for Seismic Zone 4, CPUC General Order 112E, and the CFR Regulation 49 Part 192.

Additional Facilities

As noted in the project description, the Menifee Road natural gas pipeline includes the construction of a compressor station to maintain pipeline pressure south of IEEC. The compressor station is discussed on page 5.7-27 of the Land Use section of the AFC. Staff has reviewed the proposed construction and operation of the compressor station along with the 0.9 mile gas pipeline and finds that if constructed and operated pursuant to state and federal LORS, no significant impact will be posed.

Staff also reviewed the proposed additions to the Eastern Municipal Water District. EMWD will be adding additional hardware and facilities in order to serve IEEC. As noted in the AFC project description on pages 3-23 through 3-25, equipment will be added to an existing recycled water pump station and to a planned raw water pump station. Hazardous materials used for construction would be minimal and consistent with the construction of any industrial facility. Expansion of the recycled water treatment

facility as well as the raw water pump station will include the use of treatment chemicals which are already in use at the existing EMWD facilities. Staff therefore finds that this expansion of chemical use to serve the proposed IEEC will not have a significant impact.

CUMULATIVE IMPACTS

Staff reviewed the potential for the operation of the IEEC combined with existing facilities to result in cumulative impacts on the population within the area. Chemicals stored at nearby facilities that could potentially contribute to cumulative impacts are identified in Table 5.12-3 of the AFC. Staff finds that the facility, as proposed by the Applicant and with the additional mitigation measures proposed by the Staff, poses a minimal risk of accidental release that could result in off-site impacts. It is further extremely unlikely that an accidental release that has very low probability of occurrence (about one in a million per year) would independently occur at the IEEC and another facility at the same time. Therefore, staff concludes that the facility would not contribute to a significant cumulative impact.

APPLICANT'S PROPOSED MITIGATION

The potential for accidents resulting in the release of hazardous materials is greatly reduced by the implementation of a safety management program, which includes the use of both engineering and administrative controls. Administrative controls include the development and implementation of a Safety Management Plan. Elements of facility controls and the safety management plan are summarized below.

ENGINEERING CONTROLS

Engineering controls help to prevent accidents and releases (spills) from moving off-site and impacting the community by incorporating engineering safety design criteria into the design of the facility. The engineered safety features proposed by the applicant for use at this facility include:

- construction of curbs, berms, and/or catchment basins in the hazardous materials storage areas to contain accidental releases that might happen during storage or delivery;
- physical separation of stored chemicals in separate containment areas in order to prevent accidental mixing of incompatible materials which may result in the evolution and release of toxic gases or fumes;
- the truck pad is constructed with a slope which drains any spilled material directly into a sump; and
- process protective systems including tank level monitors, automatic shut-off valves, double-wall piping, and fire protection systems.

ADMINISTRATIVE CONTROLS

Administrative controls also help to prevent accidents and releases (spills) from moving off-site and impacting the community by establishing worker training programs, process

safety management programs and by complying with all applicable health and safety laws, ordinances and standards.

The worker health and safety program will be prepared by the Applicant and will include (but is not limited to) the following elements:

- worker training regarding chemical hazards, health and safety issues, and hazard communication;
- the proper use of personal protective equipment;
- safety operating procedures for operation and maintenance of systems utilizing hazardous materials; and
- fire safety and prevention; and emergency response actions including facility evacuation, hazardous material spill cleanup, and fire prevention.

At the facility, the project owner will be required to designate an individual who has the responsibility and authority to ensure a safe and healthful workplace. The project health and safety professional oversees the health and safety program and has the authority to halt any action or modify any work practice in order to protect the workers, facility, and the surrounding community or in the event that the health and safety program is violated.

A facility Process Safety Management Program is required for the facility. This is a program for the regular inspection and maintenance of equipment, valves, piping, and appurtenances. Additionally, the process safety management program requires that only trained facility personnel are assigned to the transfer and handling of hazardous chemicals.

ON-SITE SPILL RESPONSE

In order to address the issue of spill response, the facility will prepare and implement an Emergency Response Plan which includes information on: hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, prevention equipment and capabilities, etc. Emergency procedures will be established which include evacuation, spill cleanup, hazard prevention, and emergency response.

Menifee Lake Fire Station, located on the corner of Newport Rd. and Menifee Rd. approximately 7 miles from the project site, is assigned as the off-site hazardous materials first responder for the IEEC. This station has a Hazardous Materials Response team staffed by five hazmat trained personnel. Their estimated response time is 7 to 10 minutes and they have mutual aid agreements with other teams, and private companies in the area (Fulcher 2002). Staff finds that the response time is adequate.

STAFF'S PROPOSED MITIGATION

Staff proposes twelve Conditions of Certification mentioned throughout the text (above) and listed below. **HAZ-1** ensures that no hazardous material would be used at the facility except those listed in the AFC unless there is prior approval by the County and the CEC CPM. **HAZ-2** requires that a RMP be prepared and submitted prior to the delivery of aqueous ammonia.

The worst-case accidental release scenario evaluated in the AFC assumed that accidental spills of aqueous ammonia would occur from the storage tank into the catchment system. Staff believes that the most likely event resulting in a spill would be during transfer from the delivery tanker to the storage tank. Staff therefore proposes a condition (**HAZ-3**) requiring development of a safety management plan for the delivery of aqueous ammonia. The development of a Safety Management Plan addressing delivery of ammonia will further reduce the risk of any accidental release not addressed by the proposed spill prevention mitigation measures and the required Risk Management Plan (RMP). **HAZ-4** requires that the aqueous ammonia storage tank be designed to certain rigid specifications, **HAZ-5** addresses the storage of sulfuric acid, and **HAZ-6** and **HAZ-7** address the safety of the gas pipeline over time and in the event of a nearby earthquake. The transportation of hazardous materials is addressed in **HAZ-8, HAZ-10**, and **HAZ-11**. Hydrogen storage is addressed in **HAZ-9**.

ENVIRONMENTAL JUSTICE

In the **Socioeconomics** section of this Preliminary Staff Assessment, staff presents census tract information that shows less than 50% minority and low-income populations within six miles of the proposed project. Since staff has concluded that there will be no significant direct or cumulative impacts resulting from the use and handling of hazardous materials, there will also be no significant impact to any minority or low-income populations. Therefore, there are no environmental justice issues.

FACILITY CLOSURE

The requirements for handling of hazardous materials remain in effect until such materials are removed from the site regardless of facility closure. Therefore, the facility owners are responsible for continuing to handle such materials in a safe manner, as required by applicable laws. In the event that the facility owner abandons the facility in a manner which poses a risk to surrounding populations, staff will coordinate with the California Office of Emergency Services, Riverside County Environmental Health Department, and the California Department of Toxic Substances Control (DTSC) to ensure that any unacceptable risk to the public is eliminated. Funding for such emergency action can be provided by federal, state or local agencies until the cost can be recovered from the responsible parties.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

AGENCY COMMENTS

The California Department of Education and the Romoland School District

Comment: *The California Department of Education and the Romoland School District provided staff with regulations concerning School Facilities Construction, and were concerned about the proximity of the proposed IEEC to schools in the area.*

Response: Staff agrees that it is appropriate to address this issue, although the regulations provided by CDE apply only to school siting processes and not the reverse, that is, siting industrial facilities in proximity to schools. The CAL-ARP program requires that industrial facilities demonstrate through the RMP process that their proposed use of hazardous materials will not have an impact on sensitive receptors in the vicinity and schools are specifically listed as a sensitive receptor. As noted in the discussion on IMPACTS above, staff has conducted an analysis consistent with both the CDE regulations and the CAL-ARP regulations and has specifically considered the location of the existing and proposed schools. Staff finds as a result of this analysis that no significant risk would be posed to the schools if all of staff's and applicant's mitigation measures are adopted. Staff has also addressed any potential risk to children walking to and from school.

CONCLUSIONS AND RECOMMENDATIONS

Staff's evaluation of the proposed project (with staff's proposed mitigation measures) indicates that hazardous materials use will pose little potential for significant impacts on the public. With adoption of the proposed Conditions of Certification, the proposed project will comply with all applicable Laws, Ordinances, Regulations and Standards (LORS). In response to Health and Safety Code, section 25531 et seq., the applicant will be required to develop an RMP. To insure adequacy of the RMP, staff's proposed conditions of certification require that the RMP be submitted for concurrent review by US EPA, Riverside County, and Energy Commission staff. In addition, staff's proposed conditions of certification require Riverside County's review, and staff review and approval of the RMP prior to delivery of any hazardous materials to the facility. Other proposed conditions of certification address the issue of the transportation, storage, and use of aqueous ammonia.

As mentioned under LORS, the regulations provided by CDE apply only to school siting processes and not the reverse, that is, siting industrial facilities in proximity to schools. Nevertheless, staff feels it is appropriate to address this issue. Besides, the CAL-ARP program requires that industrial facilities demonstrate through the RMP process that their proposed use of hazardous materials will not have an impact on sensitive receptors in the vicinity and schools are specifically listed as a sensitive receptor. Furthermore, even though the CDE regulations do not apply to the proposed IEEC, staff has conducted an analysis consistent with both the CDE regulations and the CAL-ARP regulations. Staff finds as a result of this analysis that no significant risk would be

posed to the schools if all of staff's and applicant's mitigation measures are adopted. In order to ensure that there would be absolutely no risk to children walking to and from school, staff proposed an additional mitigation measure prohibiting delivery of any hazardous materials during these hours.

Staff recommends the Energy Commission impose the proposed Conditions of Certification, presented herein, to ensure that the project is designed, constructed and operated to comply with applicable LORS and to protect the public from significant risk of exposure to an accidental ammonia release.

PROPOSED CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous materials not listed in Appendix C, below, or in greater quantities than those identified by chemical name in Appendix C, below, unless approved in advance by Riverside County and the CPM.

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

HAZ-2 The project owner shall concurrently provide a Business Plan and a Risk Management Plan (RMP) to the Riverside County Environmental Health Department and the CPM for review at the time the RMP is first submitted to the U.S. Environmental Protection Agency (EPA). The project owner shall include all recommendations of Riverside County and the CPM in the final documents. A copy of the final plans, including all comments, shall be provided to Riverside County and the CPM once the RMP is approved by EPA.

Verification: At least sixty (60) days prior to receiving any hazardous material on the site, the project owner shall provide a copy of a final Business Plan to the CPM. At least 60 days prior to delivery of aqueous ammonia to the site, the project owner shall provide the final EPA-approved RMP to Riverside County and the CPM.

HAZ-3 The project owner shall develop and implement a Safety Management Plan for delivery of aqueous ammonia. The plan shall include procedures, protective equipment requirements, training and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of aqueous ammonia with incompatible hazardous materials.

Verification: At least sixty (60) days prior to the delivery of aqueous ammonia to the facility, the project owner shall provide a safety management plan as described above to the CPM for review and approval.

HAZ-4 The aqueous ammonia storage facility shall be designed to either the ASME Pressure Vessel Code and ANSI K61.6 or to API 620. In either case, a secondary containment basin capable of holding 125% of the storage volume shall protect the storage tank plus the volume associated with 24 hours of rain assuming the 25-year storm.

Verification: At least sixty (60) days prior to delivery of aqueous ammonia to the facility, the project owner shall submit final design drawings and specifications for the

ammonia storage tank and secondary containment basin to the CPM for review and approval.

HAZ-5 The project owner shall ensure that no combustible or flammable material is stored within 100 feet of the sulfuric acid tank.

Verification: At least sixty (60) days prior to receipt of sulfuric acid on-site, the Project Owner shall provide copies of the facility design drawings showing the location of the sulfuric acid storage tank and the location of any tanks, drums, or piping containing any combustible or flammable materials

HAZ-6 The project owner shall require that the gas pipeline undergo a complete design review and detailed inspection 30 years after initial startup and every 5 years thereafter.

Verification: At least thirty (30) days prior to the initial flow of gas in the pipeline, the project owner shall provide an outline of the pipeline design plan to accomplish a full and comprehensive pipeline design review to the CPM for review and approval. The full and complete plan shall be amended, as appropriate, and submitted to the CPM for review and approval, not later than one year before the plan is implemented by the project owner.

HAZ-7 After any significant seismic event in the area where surface rupture occurs within one mile of the pipeline, the gas pipeline shall be inspected by the project owner.

Verification: At least thirty (30) days prior to the initial flow of gas in the pipeline, the project owner shall provide a detailed plan to accomplish a full and comprehensive pipeline inspection in the event of an earthquake to the CPM for review and approval. This plan shall be amended, as appropriate, and submitted to the CPM for review and approval, at least every five years.

HAZ-8 The project owner shall direct all vendors delivering aqueous ammonia to the site to use only tanker truck transport vehicles which meet or exceed the specifications of DOT Code MC-307.

Verification: At least sixty (60) days prior to receipt of aqueous ammonia on site, the project owner shall submit copies of the notification letter to supply vendors indicating the transport vehicle specifications to the CPM for review and approval.

HAZ-9 The project owner shall ensure that the hydrogen gas storage cylinders are stored in an area out of the plane of the turbines and that no combustible or flammable material is stored within 100 feet of the hydrogen cylinders.

Verification: At least sixty (60) days prior to receipt of hydrogen gas on-site, the Project Owner shall provide copies of the facility design drawings showing the location of the hydrogen gas cylinders and the location of any tanks, drums, or piping containing any combustible or flammable material and the route by which such materials will be transported through the facility.

HAZ-10 The project owner shall direct all vendors delivering any hazardous material to the site to use only the route approved by the CPM (I-215 to Ethanac Road to Antelope Road and then into the facility). The project owner shall obtain approval of the CPM if an alternate route is desired.

Verification: At least sixty (60) days prior to receipt of any hazardous materials on site, the project owner shall submit copies of the required transportation route limitation direction to the CPM for review and approval.

HAZ-11 The project owner shall direct all vendors delivering any hazardous materials not to deliver during the time in the mornings and afternoons when children are going to and from school. The project owner shall coordinate with any present or future schools near the facility regarding the times when students may be traveling in the transportation route area.

Verification: At least sixty (60) days prior to receipt of any hazardous materials on site, the project owner shall submit documentation to the CPM identifying the hours that delivery of hazardous materials may and may not take place.

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APPENDIX A

HAZARDOUS MATERIAL MANAGEMENT

BASIS FOR STAFF'S USE OF 75 PPM AMMONIA EXPOSURE CRITERIA

Staff uses a health-based airborne concentration of 75 PPM to evaluate the significance of impacts associated with potential accidental releases of ammonia. While this level is not consistent with the 150 ppm level used by EPA and Cal/EPA in evaluating such releases pursuant the Federal Risk Management Program and State Accidental Release Program, it is appropriate for use in staff's CEQA analysis. The Federal Risk Management Program and the State Accidental Release Program are administrative programs designed to address emergency planning and ensure that appropriate safety management practices and actions are implemented in response to accidental releases. However, the regulations implementing these programs do not provide clear authority to require design changes or other major changes to a proposed facility. The preface to the Emergency Response Planning Guidelines (ERPGs) states that "these values have been derived as planning and emergency response guidelines, **not** exposure guidelines, they do not contain the safety factors normally incorporated into exposure guidelines. Instead they are estimates, by the committee, of the thresholds above which there would be an unacceptable likelihood of observing the defined effects." It is staff's contention that these values apply to healthy adult individuals and are levels that should not be used to evaluate the acceptability of avoidable exposures for the entire population. While these guidelines are useful in decision making in the event that a release has already occurred (for example, prioritizing evacuations), they are not appropriate for and are not binding on discretionary decisions involving proposed facilities where many options for mitigation are feasible. CEQA requires permitting agencies making discretionary decisions to identify and mitigate potentially significant impacts through changes to the proposed project.

Staff has chosen to use the National Research Council's 30 minute Short Term Public Emergency Limit (STPEL) for ammonia to determine the potential for significant impact. This limit is designed to apply to accidental unanticipated releases and subsequent public exposure. Exposure at this level should not result in serious effects but would result in "strong odor, lacrimation, and irritation of the upper respiratory tract (nose and throat), but no incapacitation or prevention of self-rescue." It is staff's opinion that exposures to concentrations above these levels pose significant risk of adverse health impacts on sensitive members of the general public. It is also staff's position that these exposure limits are the best available criteria to use in gauging the significance of public exposures associated with potential accidental releases. It is, further, staff's opinion that these limits constitute an appropriate balance between public protection and mitigation of unlikely events, and are useful in focusing mitigation efforts on those release scenarios that pose real potential for serious impacts on the public. Table 1 provides a comparison of the intended use and limitations associated with each of the various criteria that staff considered in arriving at the decision to use the 75-ppm STPEL. Appendix B provides a summary of adverse effects, which might be expected to occur at various airborne concentrations of ammonia.

HAZARDOUS MATERIAL MANAGEMENT
APPENDIX A TABLE 1
Acute Ammonia Exposure Guidelines

Guideline	Responsible Authority	Applicable Exposed Group	Allowable Exposure Level	Allowable* Duration of Exposures	Potential Toxicity at Guideline Level/Intended Purpose of Guideline
IDLH[2]	NIOSH	Workplace standard used to identify appropriate respiratory protection.	300 ppm	30 min.	Exposure above this level requires the use of "highly reliable" respiratory protection and poses the risk of death, serious irreversible injury or impairment of the ability to escape.
IDLH/10[1]	EPA, NIOSH	Work place standard adjusted for general population factor of 10 for variation in sensitivity	30 ppm	30 min.	Protects nearly all segments of general population from irreversible effects
STEL[2]	NIOSH	Adult healthy male workers	35 ppm	15 min. 4 times per 8 hr day	No toxicity, including avoidance of irritation
EEGL[3]	NRC	Adult healthy workers, military personnel	100 ppm	Generally less than 60 min.	Significant irritation but no impact on personnel in performance of emergency work; no irreversible health effects in healthy adults. Emergency conditions one time exposure
STPEL[4]	NRC	Most members of general population	50 ppm 75 ppm 100 ppm	60 min. 30 min. 10 min.	Significant irritation but protects nearly all segments of general population from irreversible acute or late effects. One time accidental exposure
TWA[2]	NIOSH	Adult healthy male workers	25 ppm	8 hr.	No toxicity or irritation on continuous exposure for repeated 8 hr. Work shifts
ERPG-2[5]	AIHA	Applicable only to emergency response planning for the general population (evacuation) (not intended as exposure criteria) (see preface attached)	200 ppm	60 min.	Exposures above this level entail** unacceptable risk of irreversible effects in healthy adult members of the general population (no safety margin)

1) (EPA 1987) 2) (NIOSH 1994) 3) (NRC 1985) 4) (NRC 1972) 5) (AIHA 1989)

* The (NRC 1979), (WHO 1986), and (Henderson and Haggard 1943) all conclude that available data confirm the direct relationship to increases in effect with both increased exposure and increased exposure duration.

** The (NRC 1979) describes a study involving young animals, which suggests greater sensitivity to acute exposure in young animals. The (WHO 1986) warns that the young, elderly, asthmatics, those with bronchitis and those that exercise should also be considered at increased risk based on their demonstrated greater susceptibility to other non-specific irritants.

REFERENCES FOR APPENDIX A, TABLE 1

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ABBREVIATIONS FOR APPENDIX A, TABLE 1

ACGIH, American Conference of Governmental and Industrial Hygienists
AIHA, American Industrial Hygienists Association
EEGL, Emergency Exposure Guidance Level
EPA, Environmental Protection Agency
ERPG, Emergency Response Planning Guidelines
IDLH, Immediately Dangerous to Life and Health Level
NIOSH, National Institute of Occupational Safety and Health
NRC, National Research Council
STEL, Short Term Exposure Limit
STPEL, Short Term Public Emergency Limit
TLV, Threshold Limit Value
WHO, World Health Organization

Appendix B

SUMMARY OF ADVERSE HEALTH EFFECTS OF AMMONIA

638 PPM

WITHIN SECONDS:

- Significant adverse health effects;
- Might interfere with capability to self rescue;
- Reversible effects such as severe eye, nose and throat irritation.

AFTER 30 MINUTES:

- Persistent nose and throat irritation even after exposure stopped;
- irreversible or long-lasting effects possible: lung injury;
- Sensitive people such as the elderly, infants, and those with breathing problems (asthma) experience difficulty in breathing;
- asthmatics will experience a worsening of their condition and a decrease in breathing ability, which might impair their ability to move out of area.

266 PPM

WITHIN SECONDS:

- Adverse health effects;
- Very strong odor of ammonia;
- Reversible moderate eye, nose and throat irritation.

AFTER 30 MINUTES:

- Some decrease in breathing ability but doubtful that any effect would persist after exposure stopped;
- Sensitive persons: experience difficulty in breathing;
- asthmatics: may have a worsening condition and decreased breathing ability, which might impair their ability to move out of the area.

64 PPM

WITHIN SECONDS:

- Most people would notice a strong odor;
- Tearing of the eyes would occur;
- Odor would be very noticeable and uncomfortable.
- Sensitive people could experience more irritation but it would be unlikely that breathing would be impaired to the point of interfering with capability of self rescue
- Mild eye, nose, or throat irritation

- Eye, ear, & throat irritation in sensitive people
- asthmatics might have breathing difficulties but would not impair capability of self rescue

22 or 27 PPM

WITHIN SECONDS:

- Most people would notice an odor;
- No tearing of the eyes would occur;
- Odor might be uncomfortable for some;
- sensitive people may experience some irritation but ability to leave area would not be impaired;
- Slight irritation after 10 minutes in some people.

4.0, 2.2, or 1.6 PPM

- No adverse effects would be expected to occur;
- doubtful that anyone would notice any ammonia (odor threshold 5 - 20 PPM);
- Some people might experience irritation after 1 hr.

APPENDIX C

The following Table was reproduced from the AFC.

LAND USE

Negar Vahidi

INTRODUCTION

This land use analysis of the Inland Empire Energy Center (IEEC) focuses on two main issues: the project's consistency with local land use plans, ordinances and policies; and the project's compatibility with existing and planned land uses. In general, an electric generation project and its related facilities may be incompatible with existing and planned land uses if it creates unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts or when it unduly restricts existing or planned future uses.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

This section describes federal, state, regional, and local land use LORS applicable to the proposed project.

FEDERAL

Federal Aviation Regulations, Part 77, Section 77.13 ff

The Federal Aviation Administration requires notification of development more than 200 feet in height for certain imaginary surface planes that extend outward and upward from the runways of designated airports.

STATE

California Department of Education, Environmental School Site Selection Screening Criteria

The State of California Department of Education (CDE) is responsible for approval of the placement of all new school sites and any construction projects for existing and new school sites. CDE approval is necessary for school districts to receive funds from the State to either purchase school sites or build school facilities. The California Code of Regulations, Title 5, Form 4.01 provides health and safety criteria which school districts use when selecting school sites. These criteria are also contained in the CDE School Site Selection and Approval Guide (CDE, 2000). Relevant CDE Environmental School Site Selection Screening Criteria are listed below.

High Voltage Power Transmission Lines (CCR, Title 5, 14010; p.6 of the CDE Site Selection and Approval Guide, 2000). Is a proposed school site within:

- 100 feet from the edge of an easement for a 50-133 kv line, if any.
- 150 feet from the edge of an easement for a 220-230 kv line, if any.
- 350 feet from the edge of an easement for a 500-550 kv line, if any.

Railroads (CCR, Title 5, 14010; p.10 of the CDE Site Selection and Approval Guide, 2000): Is a proposed school site:

- Within 1,500 feet of a railroad track (mainline or spur) easement.
- Close to any high-pressure gas lines near the tracks that could rupture in the event of a derailment.

Hazardous Waste Disposal Sites (Edu. Code 17213(a)(1)-(3); Health & Safety Code 25220; p.7 of the CDE Site Selection and Approval Guide, 2000).

- Is a proposed school site within 1,500 feet of an easement of an above ground or underground pipeline, which carries hazardous substances, materials, or waste (natural gas supply to school or neighborhood excluded) that can pose a safety hazard by a Risk Analysis Study.

High-Pressure Water Pipelines, Reservoirs, Water Storage Tanks (p.11 of the CDE Site Selection and Approval Guide, 2000).

- Is a proposed school site within 1,500 feet of the easement of an above-ground or underground water pipeline, reservoir or water storage tank.

These restrictions are guidelines provided to the school districts by the CDE in the school site selection process to evaluate potential school sites, not enforceable restrictions. However, the CDE has the authority to withhold approval of sites with potential safety hazards based on feasibility and risk analysis studies.

LOCAL

Riverside County Comprehensive General Plan

Under California State planning law, each incorporated City and County must adopt a comprehensive, long-term General Plan that governs the physical development of all lands under its jurisdiction. The general plan is a broadly scoped planning document that defines large-scale planned development patterns over a relatively long timeframe. The Riverside County Comprehensive General Plan, in particular, calls for the County to examine significant projects and regional planning based on regional growth forecasts.

The General Plan consists of a statement of development policies and must include a diagram and text setting forth the objectives, principles, standards and proposals of the document. At a minimum, a General Plan has seven mandatory elements including, Land Use, Circulation, Housing, Conservation, Open Space, Noise, and Safety.

General Plan goals are an expression of the County's long-term comprehensive planning for the physical development and growth of the County. Policies are statements setting forth guidelines and implementation measures towards achieving a specific goal. The following land use goals and policies are applicable to the proposed IEEC project.

LAND USE TABLE 1
Comprehensive General Plan Goals and Policies
Relevant to the Proposed Project

Riverside County Comprehensive General Plan Goals
Land Use Element – Goal 4. The development of those areas where necessary public services can be provided and development is compatible with surrounding land uses.
Land Use Element – Goal 6. Orderly industrial development, which includes a variety of types of industry and the promotion of adequate supplies of suitable and properly distributed industrial land.
Perris Valley Land Use Planning Area Profile
Land Use Constraints – Schools within this Land Use Planning Area are already overcrowded and increased development will create further impaction, which would need to be mitigated.
Perris Valley Land Use Planning Area – Land Use Policies
Land uses within the Perris Valley Land Use Planning Area generally should be Category I (Heavy Urban – characterized by intensive commercial and industrial uses and higher residential densities) and Category II (Urban – characterized by many types and intensities or residential, commercial, and industrial land uses) land uses within the Sphere of Influence of the City of Perris and within the I-215 corridor and freeway access area.
Industrial land uses will generally be located near March Air Force Base and north of the City of Perris, west of I-215 and the Santa Fe railroad tracks.
The future development pattern within the Romoland Area should be a continuation of the existing pattern of Category III (Rural – characterized by rural land uses with lower residential densities and fewer public facilities and improvements) land uses.
Romoland Community Area Land Use Policies
3. Land Use Policy – Agriculture: Areas with prime agricultural land, Class I and II soils, shall be retained in agricultural land use to the greatest extent feasible, including economic considerations.
Public Facilities and Services Element
Utilities – The County recognizes the need for new utility services with growth and new development and has stated that it will provide necessary utilities in areas of minimal environmental and community impact. The County Planning Department will provide a clear statement of policies and standards on utilities for use in review by the California Public Utilities Commission and the utility companies and work with appropriate companies, agencies, and County departments to develop a planned approach to the future location of electrical utilities.
Energy Resources – The County's energy resource objectives include providing sites needed for power generation plants to provide adequate electrical energy for the County and the Southern California region while working with the Public Utilities Commission and utility companies to determine new sites for plants. Plants are to be sited at appropriate distances from existing communities and land use impacts must be consistent with General Plan.
Source: RIVERSIDE, 1992a

Riverside County Code – Titles 16 (Subdivisions) & 17 (Zoning)

The Riverside County Code Titles 16 and 17 discuss the use, division, and placement of facilities on land uses in the unincorporated area. In the specific land use district, dimensions for buildings, open spaces, and individual uses are regulated for the purpose of implementing the general plan of the county, protecting existing development, encouraging beneficial new development, and preventing overcrowding and congestion.

Title 16.44 discusses electrical facilities, requiring electrical power lines to be placed underground unless such placement would create soil erosion, could use existing lines and poles, or where it is determined that the use of overhead facilities would be compatible with surrounding development. Distribution lines must be underground when running parallel to or crossing scenic and recreation areas, wildlife refuges, state and national monuments, or other unique natural resources.

County Code Title 17 lists the zone classifications and districts for Riverside County as enumerated in Ordinance 348: Land Use Ordinance of Riverside County.

Ordinance 348: Land Use Ordinance of Riverside County

Ordinance 348: Land Use Ordinance of Riverside County establishes zoning districts and contains regulations governing the use of land and improvement of real property within zoning districts. Ordinance 348 implements the land use policies of the Riverside County Comprehensive General Plan (RIVERSIDE, 1992a, RIVERSIDE, 2000).

The following table presents the zone classifications and districts applicable to the project.

LAND USE TABLE 2
Zoning Ordinance Classifications and Districts Relevant to the Proposed Project

Zone Classifications and Districts
R-R Rural Residential Zone – Public utility uses: Structures and the pertinent facilities necessary and incidental to the development and transmission of electrical power and gas such as hydroelectric power plants, booster or conversion plants, transmission lines, pipelines and the like
M-SC Manufacturing, Service Commercial Zone – Industrial uses: Public utility substations and storage yards
M-M Manufacturing, Medium Zone - Industrial uses: Public utility substations and storage yards
M-H Manufacturing, Heavy Zone - Industrial uses: Public utility substations and storage yard.
Source: RIVERSIDE, 2001b.

Section 18.27(a)

Section 18.27(a) of Ordinance 348 describes the basis for the provision of variances. Section 18.27(a) states that variances may be granted when the application of zoning regulations prohibits the use of property due to the topography, shape, size, or location, while similar property in the vicinity under the same zoning classification enjoys the privileges denied the proposed use. The granting of a variance does not constitute a grant of special privileges that is inconsistent with the limitations on other properties in the vicinity and zone in which the property is situated.

Ordinance 810: Interim Open Space Mitigation Fee

Ordinance 810: Interim Open Space Mitigation Fee Ordinance establishes a development mitigation fee to supplement the financing of the acquisition of open space and to pay for development's fair share of the cost to protect and preserve wildlife, habitats, and open space within Riverside County. Fees for industrial development are assessed at $789/acre developed (Riverside, 2001c).

Ordinance 460.139: Subdivision Map Act

The Subdivision Map Act (Public Resources Code Section 66410-66499.58) provides procedures and requirements regulating land divisions (subdivisions) and mergers, and determining parcel legality. The County of Riverside adopted Ordinance 460.139 pursuant to the provisions of the Subdivision Map Act. All land divisions in the unincorporated area of the County of Riverside are subject to all of the applicable provisions of the Subdivision Map Act and this ordinance. In addition, under this ordinance, a merger of contiguous parcels requires the landowner to file an application for a Certificate of Parcel Merger. The application will be reviewed by the County Surveyor for recommendation to the County Planning Department, which has the authority to grant the Certificate of Parcel Merger. The parcels must be under common ownership, consistent with the zoning of the property, and cannot conflict with the location of any existing structures on the property (Riverside, 1998; Stamps, 2002b).

Sun City/Menifee Valley Community Plan

Although a part of the Riverside County Comprehensive General Plan, the Sun City/Menifee Valley Community Plan is intended to provide additional land use goals and policies that address the unique concerns and needs which exist within the Sun City/Menifee Valley area, thereby facilitating the implementation of policies and programs of the Comprehensive General Plan. The proposed project's natural gas compressor station, transmission line, natural gas pipeline, and wastewater pipeline are all located in or traverse land within the Sun City/Menifee Valley Community Plan area.

The linear facilities would follow existing right-of-ways (ROWs) or will be buried within existing roadways which have no land use zoning, and the natural gas compressor station site would be located on a parcel designated Light Industrial under the Sun City/Menifee Valley Community Plan. Under the plan, Light Industrial uses must be compatible with adjacent uses, including protective measures to assure compatibility; and must be designed to provide convenience and not be detrimental to residential and commercial areas.

Menifee North Specific Plan

The Menifee North Specific Plan amends the Riverside County General Plan for the Romoland, Homeland, and Winchester areas. The Specific Plan presents plans for land use, zoning, infrastructure, environmental resources, public service provisions, objectives, policies, and other implementation measures for 47 different planning areas totaling 1,636.2 acres. Planned industrial uses in the Specific Plan are designated to be in Areas 2 and 3, containing 197.5 acres of land intended to support the commercial uses in the region and blend in with the adjacent industrial uses.

The proposed IEEC is located in Planning Area 3 of the Menifee North Specific Plan, a 76.4 acre parcel zoned "Industrial" pursuant to the County's zoning ordinance.

City of Perris General Plan

A portion of the 4.9-mile wastewater pipeline crosses City of Perris lands designated as "Commercial Community." The City of Perris General Plan, adopted in October 1991, acts as the comprehensive guide for community planning in the City of Perris and its Sphere of Influence. The City of Perris combines the seven State-mandated general plan elements into the following six elements: Land Use, Housing, Circulation, Conservation/Open Space/Recreation, Public Safety, and Noise. City of Perris General Plan policies applicable to the proposed IEEC are provided in **LAND USE TABLE 3**.

LAND USE TABLE 3
General Plan Goals and Policies Relevant to the Proposed Project

City General Plan Policies – Land Use Element
Policy 2.3: Manage the outward expansion of all future development to maintain continuity with existing development, provide for orderly expansion of infrastructure and public services, minimize impacts on natural environmental resources, and preserve designated or potential open spaces.
Commercial Community (CC): Land use designation supporting retail, professional office, and service-oriented business activities including a range of uses from convenience shopping to regional shopping centers up to 200,000 square feet in area. Sites are typically located on arterial roadways to accommodate higher traffic volumes and may also be accessible by public transit.

City of Perris Zoning Ordinance

The City of Perris zoning ordinance establishes zoning districts and contains regulations governing the use of land and improvement of real property within zoning districts. The Zoning Ordinance implements the land use policies of the City of Perris General Plan.

SETTING

SITE AND VICINITY DESCRIPTION

The proposed IEEC would be built on an approximately 35-acre portion of a 46-acre parcel south of the community of Romoland in an unincorporated portion of Riverside County (Calpine, 2001a). The proposed project site is designated by the Riverside County Comprehensive General Plan as Industrial, and zoned by the County Zoning Ordinance as M-H (Manufacturing, Heavy). The proposed site is within Area 3 of the Riverside County's Menifee North Specific Plan, which has a land use designation of Industrial Park, and a zoning designation of Industrial which reflects the County's MH zone. It should be noted that the Menifee North Specific Plan is both a Riverside County Comprehensive General Plan Amendment and a County Zoning Ordinance Amendment.

The proposed project site is described as follows:

- The site is located on the eastern side of Antelope Road approximately 500 feet south of Highway 74.
- The site is bounded to the north by an asphalt production facility and concrete batch plant.
- To the south, the site is bounded by a Southern California Edison (SCE) electric power transmission line right-of-way (ROW) running in an east-west direction.
- Agricultural land and an asphalt recycling storage facility bound the IEEC site to the east.
- The Burlington Northern and Santa Fe (BNSF) railroad traverses the northeast corner of the site, forming the northeastern boundary.

The IEEC site is presently, and has historically been used to grow non-irrigated wheat, with one acre of the 46-acre site classified as Farmland of Local Importance, with prime soils. While approximately 35 acres of agricultural land on the project site will be removed from agricultural production, the applicant proposes to continue with agricultural use on the remaining 11 acres of the parcel (Calpine, 2001a).

LINEAR FACILITIES

The linear facilities for the proposed project would include the following:

- A 0.9-mile, 20-inch diameter natural gas pipeline;
- A 4.9-mile, 12- to 18-inch wastewater pipeline;
- A 0.9-mile 500 kV transmission line; and

- A 0.1-mile, 12- to 24-inch diameter recycled water pipeline crossing the site parcel from an existing pipeline along McLaughlin road to the south (Calpine, 2001a).

The natural gas pipeline would run south from the site through the Southern California Edison (SCE) utility ROW on the southern edge of the parcel to the McLaughlin Road ROW, which it would follow approximately 3,000 feet east to the BNSF Railroad ROW, and would turn south for approximately 2,000 feet to the proposed 6.6-acre Menifee Road Compressor Station before connecting to the existing gas pipeline along Menifee Road (Calpine, 2001a). Land to the north of the proposed natural gas pipeline is zoned Industrial and Utility Easements/Existing Uses under the Menifee North Specific Plan and Sun City/Menifee Valley Community Plan. Lands to the south and east of the pipeline are zoned Industrial and Rural Residential under the Sun City/Menifee Valley Community Plan, which reflect the Riverside County Manufacturing-Medium, Manufacturing-Heavy, Manufacturing-Service Commercial, and Rural Residential zoning designations, respectively. The lands adjacent to the proposed pipeline along McLaughlin Road are currently being used for agriculture.

The 6.6-acre site for the proposed Menifee Road Natural Gas Compressor Station is located on the northwest corner of Menifee and Rouse Roads, on a parcel zoned Manufacturing-Service Commercial under the Riverside County Zoning Code and Light Industrial under the Sun City/Menifee Valley Community Plan (Riverside, 1992b; Calpine, 2001a). The compressor station would occupy 2.6 acres of the site, which is currently being used to grow non-irrigated wheat. Surrounding parcels are zoned as Rural Residential and Manufacturing-Service Commercial/Industrial. The land is currently being used for agriculture and is immediately adjacent to a rural residential neighborhood with ranchette-style housing.

The 4.9-mile wastewater pipeline would run approximately two miles west from the project site along McLaughlin Road to Murrieta Road. The pipeline would then follow Murrieta Road south for 2.9 miles to the non-reclaimable wastewater interconnect in the unincorporated Sun City community (Calpine, 2001a). The length of the pipeline would be buried within the McLaughlin and Murrieta Road ROWs, which are not zoned for land use. The following describes the land uses adjacent to the proposed pipeline alignment by milepost (MP).

- MP 0.0 – 1.0: Lands adjacent to the pipeline ROW to the north are within the Menifee North Specific Plan. Lands to the south of the pipeline ROW along this segment are within the Sun City/Menifee Valley Community Plan.
- North of Pipeline: Under the Menifee North Specific Plan, the land is zoned Industrial. The land is currently used for agriculture with sparse ranchette-style rural farmhouses.
- South of Pipeline: Under the Riverside County Zoning Ordinance and Sun City/Menifee Valley Community Plan, the land is zoned for Rural Residential, Controlled Development with Mobile Homes, One-Family Dwellings, Community Commercial, and Scenic Highway Commercial. Current uses of the land include agriculture and rural residential housing consisting of single-family residences and ranchette-style houses.

- MP 1.0 – 2.0: Lands adjacent to the pipeline ROW to the north are within the City of Perris General Plan while lands to the south and west continue under the Sun City/Menifee Valley Community Plan.
- North of Pipeline: The City of Perris has designated the land north of the pipeline ROW as Commercial Community. The land is currently used for agriculture and light industrial uses.
- South of Pipeline: Lands south of the pipeline ROW are zoned by the Riverside County Zoning Ordinance and the Sun City/Menifee Valley Community Plan as Rural Residential; One-Family Dwellings; Open Area Combining Zone-Residential Development, Mobile Home Development & Mobile Home Parks; and Scenic Highway Commercial. Current uses for the land include agriculture and rural residential housing consisting of single-family dwellings and ranchette-style houses.
- MP 2.0 – 4.9: Lands adjacent to both the east and west of the pipeline ROW are zoned under the Riverside County Zoning Ordinance and Sun City/Menifee Valley Zoning Community Plan. With the exception of a narrow strip of Industrial zoning, which the pipeline crosses at MP 2.5, and a second industrial area adjacent to the west of the pipeline at MP 3.0, the remaining area adjacent to the pipeline is zoned as One-Family Dwellings, General Commercial, and Mobile Home Subdivisions & Mobile Home Parks. The area from MP 2.0 to MP 3.0 can be generally categorized as rural residential consisting of mobile homes, single-family farmhouses, and ranchette-style housing. From MP 3.0 to MP 4.9, the land can be categorized as medium-density residential interrupted by open space (i.e. Cherry Hills Golf Club) with residential-related commercial establishments along McCall Boulevard.

The 0.9-mile 500 kV electric transmission line would run easterly 2,500 feet along the existing SCE transmission ROW to the BNSF railroad. Crossing the railroad, the line would traverse northeast for 2,000 feet to the SCE substation (Calpine, 2001a). Lands adjacent to the transmission line as it follows the SCE ROW are zoned as Industrial and Rural Residential under the Sun City/Menifee Valley Community Plan and as Manufacturing-Medium, Manufacturing-Heavy, Manufacturing-Service Commercial, and Rural Residential, respectively, by Riverside County. The lands adjacent to the transmission line along McLaughlin road are currently being used for agriculture while lands northeast of the railroad are being utilized for industrial and agricultural purposes.

SURROUNDING LAND USE

The land surrounding the IEEC project site can be characterized as a combination of agricultural and industrial uses with an increasing residential proportion. Land uses surrounding the site include agriculture, industry, residential, a railroad ROW, and planned unit development.

Surrounding land uses include:

- The BNSF railroad line ROW is maintained and operated adjacent to the project site to the northeast, running in a northwest-southeast direction (Calpine, 2001a).
- U.S. Highway 74 runs in an east-west direction approximately 500 feet north of the project site.

- Interstate 215 runs in a north-south direction approximately ½ mile west of the site.
- An asphalt production facility is adjacent to the IEEC site to the north and asphalt recycling storage facility is adjacent to the east of the proposed site.
- A heavy construction equipment storage yard is maintained across Antelope Road to the west of the proposed IEEC site.
- SCE maintains and operates electric power transmission lines running in an east-west direction on the southern edge of the project site. The power lines include one 500 kV and one 161 kV electric power transmission line (Calpine, 2001a).
- SCE maintains the substation from which the 500 kV and 161 kV transmission lines originate. The substation is located on the corner of Menifee Road and U.S. Highway 74.
- Rural residences on the south side of McLaughlin Road are located approximately 500 feet southwest of the proposed site.
- On the south side of the SCE electric power lines, agricultural lands are located along the McLaughlin Road alignment.
- The Block Graphics printing facility is located across the railroad line to the east of the proposed site.
- The Romoland Elementary School and Headstart Daycare are located approximately 1,200 feet north of the proposed site on Antelope Road.
- Four churches are located within one mile of the site:
- The Romoland Set Free Church is approximately 0.6 miles northwest of the site on Adams Avenue;
- The Romoland Assembly of God is approximately 0.5 miles northwest of the site on Monroe Avenue;
- The Believers Bible Church is approximately 0.9 miles east of the site; and
- The Turning Point Christian Center is approximately 0.2 miles west of the proposed IEEC site on Ethanac Road (Calpine, 2002a).
- Five churches are located on Murrieta Road along the route of the non-reclaimable wastewater pipeline, including:
- St. Stephens Episcopal Church;
- Church of Today;
- Sun City Bible Church;
- St. Vincent Ferrer Church; and
- First Baptist Church (Calpine, 2002a).
- The Sun City Convalescent Care center is just over one mile southwest of the proposed IEEC project site on Encanto Drive (Calpine, 2002a).
- The unincorporated retirement community of Sun City is located approximately 1.5 miles southwest of the proposed site.

- The Menifee Valley Medical Center is located just over one mile south of the proposed site on McCall Boulevard (Calpine, 2002a).

PLANNED LAND USES

The Inland Empire region is experiencing rapid growth and development, including in the vicinity of the project site. Planned land uses that staff is aware of are listed below, and in the Cumulative Impacts section (see **LAND USE TABLE 6**) of this analysis. With respect to land use compatibility, staff is generally concerned with land uses that would be located within one mile of the proposed project. Several planned uses that are further than one mile from the project site are also listed here in response to comments from members of the Romoland community concerning the proximity of planned schools.

Planned land uses include:

- The Menifee North Specific Plan: a 1,636 acre mixed use development with 951 planned dwelling units between Trumble Road on the west and Juniper Flats Road on the east, Alicante Drive in the north and midway between Grand and Chambers Avenues in the south, east of the City of Perris. The proposed IEEC is located in Planning Area 3 of the specific plan.
- Two residential subdivisions: one 87-acre, 348 dwelling unit subdivision ¼ mile northeast of the proposed IEEC; and one 29.7 acre, 137 dwelling unit subdivision ¾ mile southwest of the proposed IEEC.
- The Victorious Life Christian Center, approximately 3.4 miles southwest of the proposed site and ½ mile from the proposed wastewater pipeline

The Romoland School District (the District) has proposed a new school site, referred to as the Ashby Site, on the west side of Antelope Road approximately 900 feet south off the proposed IEEC site (RSD, 2002b). The Ashby Site is approximately 3,300 feet south of Highway 74, 3,000 feet southwest of the BNSF railroad line, 1,000 feet south of the existing SCE 500 kV transmission line, and 700 feet south of Eastern Municipal Water District raw and reclaimed water pipelines along McLaughlin Road. It should be noted that the District had been focusing planning efforts on the Ashby site prior to the IEEC proposal. The District has stated in their letter dated May 13, 2002, that plans for other new schools in the Menifee North Specific Plan (MNSP) have been discussed, but "[d]ue to the uncertainty as to the precise locations of future school sites and the timing and sequence of future residential development within the District's boundaries, the parties involved in planning for the MNSP agreed that individual school site locations would be refined when tract maps were developed" for the area within the specific plan (RSD, 2002e). The District further states in the May 13, 2002 letter "there has been little progress made in developing area-specific tract maps. For this reason, the District has chosen not to expand its limited resources on the preparation of site-specific feasibility studies for possible future school sites...(RSD, 2002e)"

IMPACTS

THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the Guidelines to the California Environmental Quality Act (CEQA), a project may have a significant effect on land use if a proposed project would:

- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect;
- Disrupt or divide the physical arrangement of an established community.
- Convert Prime Farmland, Farmland of Statewide Importance, or Unique Farmland to non-agricultural use.

A project may also have a significant impact on land use if it would create unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts or when it precludes or unduly restricts existing or planned future uses.

CONSISTENCY WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Public Resources Code section 25525 states that the Energy Commission shall not certify any facility when it finds "that the facility does not conform with any applicable state, local, or regional standards, ordinances, or laws, unless the [Energy] commission determines that such a facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving such public convenience and necessity. In making the determination, the commission shall consider the entire record of the proceeding, including, but not limited to the impacts of the facility on the environment, consumer benefits, and electric system reliability." In no event shall the commission make any finding in conflict with applicable federal law or regulation. When determining if a project is in conformance with state, local or regional ordinances or regulations, the Energy Commission typically meets and consults with applicable agencies to determine conformity. The laws, ordinances, regulations, standards (LORS) and policies applicable to the project have been analyzed below (in **LAND USE TABLE 4** and **LAND USE TABLE 5**) to determine the proposed IEEC's consistency with each requirement or standard.

On March 5, 2002, the Riverside County Board of Supervisors submitted a letter from the County's Planning Department to the Commission that analyzed the proposed IEEC and ancillary facilities for conformance with local land use designations and other relevant LORS. The letter described those authorizations that would be required if the IEEC project were under the County's jurisdiction, including a list of proposed conditions that would be applicable under such circumstances. According to the letter, "…the County understands that the CEC has exclusive authority to certify all power plant sites and related facilities in California," and that "…issuance of a certificate by the CEC operates in lieu of any permit or authorization required by any state or local agency, including land use authorizations…" (Riverside 2002a).

The County concluded that if it were the permitting agency, the project would be authorized as a conditional use in the M-H (Manufacturing-Heavy) Zone, finding that the IEEC "…is of substantially the same character and intensity, or even less intensity, as uses specifically identified as conditionally permitted uses." The County further concluded that granting a variance allowing IEEC's HRSG stacks to exceed the M-H Zone's 105-foot height limitation "…would not constitute a grant of special privileges," and "…would further the County's intent and purpose in creating the M-H Zone." Regarding other components of the proposed project, the County concluded that the proposed compressor station "…is substantially the same in character and intensity as other conditionally permitted uses in the M-SC [Manufacturing-Service Commercial] Zone…" and would therefore be permitted as a conditional use; moreover, an encroachment permit for the proposed McLaughlin Road natural gas pipeline was found to be "…reasonably necessary…" and "…in the public interest…" (Riverside 2002a).

Staff has reviewed the County's letter and the proposed conditions within the letter. Staff believes that the Conditions of Certification proposed throughout appropriate technical sections of this PSA adequately address both the general conditions and specific concerns raised by the County. In technical areas where appropriate, staff has explicitly included discussion of the County's letter and proposed conditions, including specific Conditions of Certification requiring payment of the various mitigation fees typically imposed by the County for this type of industrial project. For more detailed information, please see the following sections of this PSA: **Biological Resources; Socioeconomics; Geology, Mineral Resources, and Paleontology; Noise and Vibration; Waste Management**; **Worker Safety and Fire Protection**; **Facility Design**; **Hazardous Materials Management**; **Traffic and Transportation**; **Soil and Water Resources**; and **Visual Resources**.

LAND USE TABLE 4 provides a listing of the LORS applicable to the IEEC along with a determination and discussion of the proposed project's consistency with applicable LORS.

LAND USE TABLE 4
Proposed Project's Consistency with LORS Applicable to Land Use

LORS		Consistency Determination	Basis for Consistency
Source	**Objective and/or Policy Description**		
Federal			
Federal Aviation Administration	Title 49, United States Code, section 44718 and Title 14 of the Code of Federal Regulations: Construction or alteration of a structure in the vicinity of an airport cannot exceed obstruction standards and must comply with proper marking and lighting.	Yes	The proposed IEEC is 3.2 miles east of the Perris Valley Airport. The proposed project site exceeds neither 200 feet, nor the most restrictive radius from nearby airport runways (RIVERSIDE, 1992a).
State			
California Department of Education (CDE), Environmental School Site Selection Criteria	Provides environmental criteria to help school districts site schools in safe locations.	See **LAND USE TABLE 5** for detailed analysis of the proposed project with respect to each specific applicable school siting criteria	Impacts to school uses is discussed in detail in the **COMPATIBILITY WITH EXISTING USES** and **COMPATIBILITY WITH PLANNED LAND USES** sections (below).

LAND USE TABLE 4
Proposed Project's Consistency with LORS Applicable to Land Use

LORS		Consistency Determination	Basis for Consistency
Source	**Objective and/or Policy Description**		
Local			
Riverside County Comprehensive General Plan: Land Use Element	Goal 4: The development of those areas where necessary public services can be provided and development is compatible with surrounding land uses.	Yes	As the proposed IEEC would be sited in an area adjacent to existing industrial uses, and is currently designated for industrial uses, the project would be compatible with surrounding land uses.
Riverside County Comprehensive General Plan: Land Use Element	Goal 6: Orderly industrial development which includes a variety of types of industry and the promotion of adequate supplies of suitable and properly distributed industrial land.	Yes	The proposed IEEC would be sited in an area adjacent to existing industrial uses, is currently designated for industrial uses, and is zoned for heavy manufacturing. As such, the utilization of the site for the IEEC could be considered orderly infill of an industrial area.
Riverside County Comprehensive General Plan: Perris Valley Land Use Planning Area Profile	Land Use Constraints: Schools within this Land Use Planning Area are already overcrowded and increased development will create further impaction, which would need to be mitigated.	Yes (Conditional upon applicant's compliance with Condition of Certification **SOCIO-1**)	In their March 5, 2002 letter, Riverside County has recommended that any impacts to the Romoland School District shall be mitigated in accordance with California State law (RIVERSIDE, 2002a). The **Socioeconomics** section of this PSA provides a discussion of impacts associated with school overcrowding, and recommends Condition of Certification **SOCIO-1,** which requires the project owner to pay the one-time statutory school facility development fee.
Riverside County Comprehensive General Plan: Perris Valley Land Use Planning Area	Land Use Policies: Land uses within the Perris Valley Land Use Planning Area generally should be Heavy Urban and Urban within the Sphere of Influence of the City of Perris and within the I-215 corridor and freeway access area.	Yes	The Heavy Urban designation described for the City of Perris Sphere of Influence and I-215 corridor includes industrial uses similar to power generation facilities. The proposed IEEC site is within the I-215 corridor and freeway access area.
Riverside County Comprehensive General Plan: Perris Valley Land Use Planning Area	Land Use Policies: Industrial land uses will generally be located near March Air Force Base and north of the City of Perris, west of I-215 and the Santa Fe railroad tracks.	Yes	While the IEEC site is south of Perris and east of I-215, the proposed site is on the west side of the Santa Fe railroad tracks. Therefore, the site's location is considered consistent with the intent of this policy to locate industry in the specified areas.
Riverside County Comprehensive General Plan: Perris Valley Land Use Planning Area	Land Use Policies: The future development pattern within the Romoland Area should be a continuation of the existing pattern of Rural land uses.	Yes	The proposed IEEC would be consistent with Romoland's pattern of Rural uses as the Riverside County Rural Residential zone allows for public utilities necessary for the development and transmission of electrical power.

LAND USE TABLE 4
Proposed Project's Consistency with LORS Applicable to Land Use

LORS		Consistency Determination	Basis for Consistency
Source	**Objective and/or Policy Description**		
Riverside County Comprehensive General Plan: Romoland Community Area Land Use Policies	3. Land Use Policy – Agriculture: Areas with prime agricultural land, Class I and II soils, shall be retained in agricultural land use to the greatest extent feasible, including economic considerations	Yes	While approximately one acre of Farmlands of Local Importance will be permanently converted for the power plant site and 2.6 acres will be permanently converted for the compressor station, all other impacts to prime soils would be temporary. However, impacts to Farmlands of Local Importance are not considered significant under CEQA. In addition, the amount of acreage being converted is not considered significant under DOC mapping guidelines. Impacts to agricultural land resources are discussed in detail in the **COMPATIBILITY WITH EXISTING USES** and **COMPATIBILITY WITH PLANNED LAND USES** sections (below).
Riverside County Comprehensive General Plan: Public Facilities and Services Element	Utilities: The County will provide a clear statement of policies and standards on utilities for use in review by the California Public Utilities Commission and the utility companies and work with appropriate companies, agencies, and County departments to develop a planned approach to the future location of electrical utilities.	Yes	Riverside County has provided staff with a letter documenting the recommendations the County would make if it were the agency responsible for permitting the IEEC. This letter is considered to be the County's guidance on its policies and standards. (RIVERSIDE, 2002a).
Riverside County Comprehensive General Plan: Public Facilities and Services Element	Energy Resources: The County's energy resource objectives include providing sites needed for power generation plants to provide adequate electrical energy for the County and Southern California region while working with the Public Utilities Commission and utility companies to determine new sites for plants. Plants are to be sited at appropriate distances from existing communities and land use impacts must be consistent with General Plan.	Yes	The siting of the plant, as suggested by Riverside County in their March 5, 2002 letter, is consistent with the County General Plan as a conditional use which could be appropriate allowing the integration of conditions on the project (RIVERSIDE, 2002a). The proposed site is within the established community of Romoland, a community comprised largely of rural residential areas, agriculture, and industrial uses. The proposed project would be consistent with the character of the Romoland Community. This is discussed more fully in the **COMPATIBILITY WITH EXISTING USES** and **COMPATIBILITY WITH PLANNED LAND USES** sections (below).
Riverside County Zoning Ordinance: County Code 16 (Subdivisions)	County Code 16.44: Requires electrical power lines to be placed underground unless such placement would create soil erosion, could use existing lines and poles, or where it is determined that the use of overhead facilities would be compatible with surrounding development. Distribution lines must be underground when running parallel to or crossing scenic and recreation areas, wildlife refuges, state and national monuments, or other unique natural resources.	Yes	No scenic or recreation areas, wildlife refuges, state and national monuments, or other unique natural resources are adjacent to or would be traversed by electrical distribution lines for the project. As SCE electric power transmission lines currently cross the site, the construction of overhead transmission facilities for electrical distribution from the plant would be compatible with existing uses.
Ordinance 348: R-R Rural Residential Zone	Public Utility Uses: Structures and the pertinent facilities necessary and incidental to the development and transmission of electrical power and gas such as hydroelectric power plants, booster or conversion plants,	Yes	Electrical transmission lines would traverse lands zoned as Rural Residential and Light Industrial. Under the Riverside County zoning code, transmission lines are an approved use as a ROW allowed

LAND USE TABLE 4
Proposed Project's Consistency with LORS Applicable to Land Use

LORS		Consistency Determination	Basis for Consistency
Source	Objective and/or Policy Description		
	transmission lines, pipelines, and the like.		across zones.
Ordinance 348: M-SC Manufacturing, Service Commercial Zone	Industrial Uses: Public utility substations and storage yards	Yes	In the March 5, 2002 letter, the County of Riverside stated that the Natural Gas Compressor Station the project would locate in a M-SC zone, could be authorized as a conditionally permitted use (RIVERSIDE, 2002a). The County provided a list of conditions of acceptance ranging from flood control to trash enclosure. Applicable land use conditions from this list have been independently analyzed as a part of this staff assessment. Applicable conditions related to other subjects have been analyzed in sections of this staff assessment, as appropriate (as described above).
Ordinance 348: M-M Manufacturing, Medium Zone	Industrial Uses: Public utility substations and storage yards	Yes	Electrical transmission lines would traverse lands zoned as Manufacturing, Medium. Under the Riverside County zoning code, transmission lines are an approved use as a ROW under this zone.
Ordinance 348: M-H Manufacturing, Heavy Zone	Industrial Uses: Public utility substations and storage yard	Yes	In the March 5, 2002 letter, the County of Riverside stated that the IEEC, which would be located in a M-H zone, could be authorized as a conditionally permitted use (RIVERSIDE, 2002a). The County provided a list of conditions of acceptance ranging from flood control to trash enclosure. Applicable land use conditions from this list have been independently analyzed as a part of this staff assessment. Applicable conditions related to other subjects have been analyzed in sections of this staff assessment, as appropriate (as described above).
Ordinance 348: Section 18.27(a), Basis for Variance	Basis for Variance: Because of special circumstances applicable to the parcel, including shape, size, topography, location or surroundings, the strict application of the Land Use Ordinance deprives such property of privileges enjoyed by other property in the vicinity that is under the same zoning classification.	Yes	As the strict application of the M-H Zone height restriction in the Land Use Ordinance would deprive the property of privileges enjoyed by other property in the vicinity that is under the same zoning classification, Riverside County (in their March 5, 2002 letter) made the necessary findings that because of special circumstances applicable to the parcel, a variance from height restrictions in the M-H Zone could be granted.
Ordinance 460.139 Subdivision Map Act	Establishes that all land divisions in the unincorporated area of the County of Riverside are subject to all of the applicable provisions of the Subdivision Map Act. In addition, under this ordinance, a merger of contiguous parcels requires the landowner to file an application for a Certificate of Parcel Merger.	Yes (Conditional upon applicant's compliance with Condition of Certification **LAND-1**)	The property consists of 10 legal parcels created by the parcel map of Romola Farms No. 6A, but must be legally merged to comply with this ordinance. Condition of Certification **LAND-1** requires the applicant to obtain necessary approval(s) from the County and complete any lot merger or lot line adjustments from the Riverside County Planning Department for the project's

LAND USE TABLE 4
Proposed Project's Consistency with LORS Applicable to Land Use

LORS		Consistency Determination	Basis for Consistency
Source	Objective and/or Policy Description		
			compliance with this ordinance.
Ordinance 810: Interim Open Space Mitigation Fee	Establishes a development mitigation fee to supplement the financing of the acquisition of open space and to pay for development's fair share of the cost to protect and preserve wildlife, habitats, and open space within Riverside County. Fees for industrial development are assessed at $789/acre developed.	Yes (Conditional upon applicant's compliance with Condition of Certification **BIO-14**)	In the March 5, 2002 letter, the County of Riverside provides the conditions that would be imposed on projects impacting open space. The **Biological Resources** section of this PSA provides a discussion of impacts associated with impacts on wildlife, habitat, and open space in Riverside County, and recommends Condition of Certification **BIO-14,** which requires the Applicant to pay an Interim Open Space Mitigation Fee in the amount assessed in accordance with Riverside County Ordinance No. 810 to assist in providing revenue to acquire and preserve open space and habitat (Riverside 2002a).
Sun City/ Menifee Valley Community Plan: Industrial and Manufacturing Policies and Standards	Light Industrial Uses: Must be compatible with adjacent uses, including protective measures to assure compatibility; and must be designed to provide convenience and not be detrimental to residential and commercial areas.	Yes	In the March 5, 2002 letter, the County of Riverside stated that the Natural Gas Compressor Station the project would locate in a Light Industrial designation, could be authorized as a conditionally permitted use (RIVERSIDE, 2002a). The County provided a list of conditions of acceptance ranging from flood control to trash enclosure. Applicable land use conditions from this list have been independently analyzed as a part of this staff assessment. Applicable conditions related to other subjects have been analyzed in other sections of this staff assessment, as appropriate (as described above).
Menifee North Specific Plan	Planning Area 3: Zoned "Industrial" pursuant to the County's zoning ordinance.	Yes	The IEEC is proposed to be sited within Planning Area 3 of the Menifee North Specific Plan, which, while zoned "Industrial" must be consistent with the Riverside County zoning for the land. In the March 5, 2002 letter, the County of Riverside stated that the IEEC could be authorized as a conditionally permitted use (RIVERSIDE, 2002a). The County provided a list of conditions of acceptance ranging from flood control to trash enclosure. Applicable land use conditions from this list have been independently analyzed as a part of this staff assessment. Applicable conditions related to other subjects have been analyzed in other sections of this staff assessment, as appropriate (as described above).
City of Perris General Plan	Policy 2.3: Manage the outward expansion of all future development to maintain continuity with existing development, provide for orderly expansion of infrastructure and public services, minimize impacts on natural environmental resources, and preserve designated or potential open spaces.	Yes	The development of infrastructure in the form of a wastewater pipeline from the proposed IEEC is consistent with Policy 2.3 as the pipeline will follow an existing pipeline ROW through the jurisdiction of Perris.

LAND USE TABLE 4
Proposed Project's Consistency with LORS Applicable to Land Use

LORS		Consistency Determination	Basis for Consistency
Source	**Objective and/or Policy Description**		
City of Perris General Plan	Commercial Community (CC): Land use designation supporting retail, professional office, and service-oriented business activities; typically located on arterial roadways to accommodate higher traffic volumes and may also be accessible by public transit.	Yes	The wastewater pipeline would traverse lands zoned by City of Perris as Commercial Community. As the pipeline would be located in an existing City road ROW, the portion of the pipeline would be consistent with the zoning.
SCAG RCPG	Provides direction for managing growth-related issues by encouraging comprehensive land-use and transportation planning, assessment of regional land conversion, development of environmentally friendly land uses, and funding aspects of resource protection.	Yes	The proposed IEEC does not conflict with any of the land conversion, growth management, land use or resource protection guidelines set forth in the SCAG RCPG.

COMPATIBILITY WITH EXISTING LAND USES

In general, areas surrounding the proposed project site and the Romoland community can be characterized by a mixture of rural residential neighborhoods interspersed with heavy industry, and utilities/infrastructure within large-acreage agricultural areas.

The proximity of the proposed IEEC to nearby sensitive receptors such as residential areas, schools, and churches (e.g., Romoland Elementary School, Headstart Daycare) could create air quality, public health, visual, and noise impacts to these sensitive receptors. These impacts are addressed in greater detail in the **AIR QUALITY**, **PUBLIC HEALTH**, **VISUAL RESOURCES,** and **NOISE** Sections of the PSA.

Residential areas near the proposed IEEC site are currently surrounded with a mixture of industrial, light manufacturing, and commercial uses. For example, U.S. Highway 74, the asphalt production facility, Block Graphics Printing, the SCE substation, the BNSF Railroad ROW, and Interstate 215, are all existing industrial and infrastructure uses that are currently in close proximity to sensitive receptors such as the existing residential and school uses in the Romoland area (e.g. Romoland Elementary School). In a letter from the CDE's School Facilities Planning Division to the CEC dated January 30, 2002, the CDE notes "…the highway and the railroad tracks are substantially closer to this school [i.e., Romoland Elementary School] than the proposed power plant…" (CDE, 2002b). As such, the proposed IEEC is considered compatible with the land use character and the pattern of development within the area. Impacts would be less than significant.

Farmland Conversion

The IEEC site has historically been used to grow non-irrigated wheat, with one acre of the 46-acre site classified as Farmland of Local Importance, with prime soils, by the California Department of Conservation (DOC) and a local agricultural committee[1]. As

[1] The California Department of Conservation (DOC) established the Farmland Mapping and Monitoring Program (FMMP) in 1982 in response to a critical need for assessing the location and quantity of agricultural lands and conversion of these lands to other uses. The resulting Important Farmland (IFL) maps and related databases constitute the only statewide land use inventory conducted on a regular basis that identifies the conversion of agricultural land to urban and other uses. Following are procedures by which DOC determines the status of farmlands:

the site has not been irrigated, however, the acre of prime soils is not prime farmland. While conversion of Prime, Statewide, or Unique Farmlands is considered a significant impact under CEQA, conversion of Farmland of Local Importance is not considered a significant impact.

Similarly, the proposed gas compressor station is located on 2.6 acres of fallow, un-irrigated land classified as prime soils and Farmland of Local Importance, in an area currently designated Industrial and zoned Manufacturing-Service Commercial (M-SC) by the Sun City/Menifee Valley Community Plan. As with the IEEC site, because the land is "Farmland of Local Importance" and is not irrigated, the compressor station site cannot be considered to have lands that are Prime, Statewide, or Unique Farmlands, and thus conversion of the land is not considered a significant impact.

Both the proposed IEEC site and the proposed compressor station site may have been irrigated in 1992 and 1994 when Riverside County rezoned the respective sites. However, after field visits and examining DOC maps and aerial photography for signs of cultivation and irrigation, there is no evidence that the lands have been irrigated within a 5-year mapping cycle. As such, the lands classified as prime soils that would be converted by the project cannot be considered Prime Farmlands. Conversion of these sites would not be a significant impact, since Farmlands of Local Importance are included in the CEQA Guidelines' significant criteria. Additionally, the DOC has a mapping minimum unit of 10 acres, with smaller parcels being absorbed into the surrounding classifications. Therefore, due to the small area of the prime soils affected, conversion of the one-acre proposed IEEC site and the 2.6-acre proposed compressor station site would not be considered significant under Department of Conservation mapping guidelines.

Due to the location of the project's linear facilities along existing ROWs, either buried or following along existing transmission line routes, the linear facilities would be compatible with existing land uses and are not expected to have any significant permanent land use impacts. Temporary disturbances to the ROW lands due to construction would be minor and short term (Calpine, 2001a). Therefore, the proposed linear facilities for the project would have a less-than-significant impact on agricultural land resources.

Staff believes that the proposed IEEC would be consistent with the current development pattern and land use character in the Romoland Area and poses no significant impact with regard to land use character compatibility.

COMPATIBILITY WITH PLANNED LAND USES

The proposed IEEC would be compatible with the planned land uses staff has described in this staff assessment with the exception of the Romoland School District's Ashby

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- DOC updates soil mapping every two years using infra-red aerial photos provided by NASA at a scale of 1:130,000. Their most recent update is for 2000.
- Based on these maps, land is evaluated to determine its farmland designation. If a particular piece of land is fallow, it is then flagged.
- In order to qualify as Prime Farmland, rather than just Prime soil, the land must be irrigated as well as having prime soil attributes.
- DOC has a minimum mapping unit of 10 acres, with smaller than 10-acre parcels being absorbed into the surrounding classifications.

Site. The Menifee North Specific Plan describes Planning Area 3, where the IEEC would be located, as an industrial area. The residential subdivisions, while within one mile of the IEEC site, have room for buffer areas between their location and the proposed power plant site. The Victorious Life Christian Center would be well outside the area of impact of the IEEC. Given that the CDE School Facilities Planning Division has stated that it could not approve the Ashby site due to safety concerns over proximity of the proposed IEEC, the proposed IEEC would preclude the planned development of a school at the Ashby Site.

In a letter from the CDE's School Facilities Planning Division dated January 30, 2002, the Siting Division states that "[b]ased upon the potential health and safety issues related to this project [the proposed IEEC] CDE has advised the Romoland School District that the proposed new school site that is located 900 ft. southwest of the power plant could not be approved (CDE, 2002b)." The Romoland School District notes that siting schools in the Romoland area was already difficult with the location of existing industrial uses such as the BNSF Railroad and existing transmission lines and pipelines (RSD, 2002b). The District stated in their May 13, 2002 letter to the Applicant that:

"due to its limited resources, the District is cautious about expending significant resources on the investigation of new school sites... For this reason, and until the recent decision of the California Department of Education ("CDE") concerning the necessary buffer for the Inland Empire Energy Center, the District had directed siting efforts at the Ashby school site..."

LAND USE TABLE 5 provides discussion of the CDE site selection criteria applicable to the area surrounding the proposed IEEC. It should be noted that the following are criteria used by the CDE to ensure the siting of new schools in appropriate locations (i.e., a safe and healthy environment). These criteria can be waived by the CDE on a case-by-case basis based on the need for schools and a Risk Analysis Study conducted by the school district to determine the existence of a safety hazard to a planned school site. This is often the case in highly urban areas with existing potentially hazardous industrial uses, where sufficient land for school sites is difficult to find. Based on the results of Risk Analysis studies, many school districts in urban areas often find that existing industrial uses do not pose safety hazards, or that hazards can be mitigated. Therefore, although the use of these criteria may eliminate sites from consideration, it is possible that a site may be approved if CDE has assurance from a school district that the Risk Analysis Study finds no potentially significant safety hazards to the school use, or that the school's design has measures built in that would offset the potential impacts of any nearby harmful land uses.

LAND USE TABLE 5
Applicable CDE School Site Selection Criteria

Source	Siting Criteria	Impacted by IEEC	Impact Discussion
CDE Environmental School Site Selection Screening Criteria - High Voltage Power Transmission Lines [CCR,	Is a proposed school site within: ▪ 100 feet from the edge of an easement for a 50-133 kv line, if any. ▪ 150 feet from the edge of an easement for a 220-230 kv line, if any. ▪ 350 feet from the edge of an easement	No Impact	The Ashby Site is approximately 1,000 feet from the existing SCE 500 kV transmission lines. The proposed IEEC would be using the existing SCE transmission ROW for new lines from the plant. As such, the Ashby Site

LAND USE TABLE 5
Applicable CDE School Site Selection Criteria

Source	Siting Criteria	Impacted by IEEC	Impact Discussion
Title 5, 14010; p.6 of the CDE Site Selection and Approval Guide, 2000].	for a 500-550 kv line, if any.		would not be impacted by existing or proposed transmission lines.
CDE Environmental School Site Selection Screening Criteria - Railroads [CCR, Title 5, 14010; p.10 of the CDE Site Selection and Approval Guide, 2000].	Is a proposed school site: ▪ Within 1,500 feet of a railroad track (mainline or spur) easement, if any. ▪ Close to any high-pressure gas lines near the tracks that could rupture in the event of a derailment.	No Impact	The Ashby Site is approximately 3,000 feet from the existing BNSF railroad. The proposed IEEC would not change the railroad ROW. The Ashby Site would not be impacted by the BNSF railroad.
CDE Environmental School Site Selection Screening Criteria - Hazardous Waste Disposal Sites [Edu. Code 17213(a)(1)-(3); Health & Safety Code 25220; p.7 of the CDE Site Selection and Approval Guide, 2000].	Is a proposed school site within 1,500 feet of an easement of an above ground or underground pipeline which carries hazardous substances, materials, or waste (natural gas supply to school or neighborhood excluded) that can pose a safety hazard by a Risk Analysis Study.	Potential Impact	The Ashby Site is not currently within 1,500 feet of a hazardous substance pipeline. The construction of the proposed wastewater pipeline along McLaughlin Road in conjunction with the project would be within 1,500 feet of the Ashby Site. It should be noted that this pipeline would be placed within and existing utility ROW, and is not expected to have significant land use impacts. However, a Risk Analysis Study would need to be conducted to identify safety hazards of existing industrial land uses and utility ROWs in the area, including the proposed IEEC.
CDE Environmental School Site Selection Screening Criteria - High-Pressure Water Pipelines, Reservoirs, Water Storage Tanks [p.11 of the CDE Site Selection and Approval Guide, 2000].	Is a proposed school Within 1,500 feet of the easement of an above-ground or underground water pipeline, reservoir or water storage tank.	No Impact	The Ashby Site is within 1,500 feet of an existing raw water pipeline along McLaughlin Road. The proposed IEEC would utilize this existing water line and would not change this existing impact to the Ashby Site.

Since the CDE has stated that it cannot approve the Ashby Site due to its proximity to the proposed IEEC, development of the Ashby Site with a school use is precluded. It is unclear, however, if the CDE would have approved the site if the IEEC had not been proposed, as the Ashby Site would be within 1,500 feet of an existing water pipeline (which is one of the items in the CDE School Site Selection Criteria) along McLaughlin Road, in close proximity to many existing industrial uses, and within areas intended for future industrial development based on existing County of Riverside Plans (RIVERSIDE, 1994). Other existing industrial land uses adjacent to the proposed IEEC site, such as the concrete batch plant and the asphalt plant, while not triggering CDE siting restrictions, would also have had a potential to negatively affect the proposed Ashby School Site. Staff has requested information relating to the proximity of the Ashby Site to existing industrial uses and CDE Siting Criteria buffers in Data Request 178 submitted to the applicant in the April 4, 2002 Data Request Packet (CEC, 2002j). As of the writing of this Preliminary Staff Assessment responses to staff's data request regarding this information have not been received. The intent of these requests is to clarify the degree to which the proposed IEEC has the ability to preclude planned school uses (such as the Ashby Site), versus existing nearby industrial land uses' ability to preclude these planned uses. Given that detailed responses to specific data requests

regarding this issue have not been received, staff does not believe that the proposed IEEC's preclusion of the planned Ashby Site would be a significant impact.

While a June 5, 2002 letter from the School District discusses the site development costs of a school site at McCall Boulevard and Junipero Road, staff has not received other information regarding plans for sites that can be considered more than speculative. Staff is aware that the District is currently investigating other possible sites for several schools, but cannot find that the IEEC would necessarily preclude any other potential school sites. In addition, staff has not seen any compelling evidence that would lead to the conclusion that there are not sufficient appropriate alternative sites available in the area for new schools.

CUMULATIVE IMPACTS

LAND USE TABLE 6 shows a list of cumulative projects in the vicinity of the proposed IEEC.

LAND USE TABLE 6
Potential Cumulative Projects

Development	Size	Location	Jurisdiction	Status
Menifee North Specific Plan	1,636 acres	Between Trumble Road in the west and Juniper Flats Road in the east, Alicante Drive in the north and midway between Grand and Chambers Avenues in the south, east of the City of Perris	Riverside County	Riverside County is currently working on an amendment which would reduce the industrial area in Planning Area 41. 951 dwelling units planned. No estimated start date for construction.
Parcel Map Division	5 acres	¼ mile southwest of the proposed IEEC	Riverside County	Approved in May 1995 for division of the property into 3 parcels.
Resid. Subdivision	87 acres	¼ mile northeast of the proposed IEEC	Riverside County	Approved in October 2001. 348 dwelling units planned, but no construction has begun.
Resid. Subdivision	29.7 acres	¾ mile southwest of the proposed IEEC	Riverside County	Approved in August 2000. 137 dwelling units planned, but no construction has occurred
Plaza Del Sol Specific Plan	22.4 acres	Between Encanto Rd. to the west, Sherman Rd. to the east, Shadel Rd. to the north, and McCall Rd. to the south, approximately 1.5 miles southwest of the proposed IEEC.	Riverside County	Approved in 1983. Commercial area. No construction has begun on the project..
Winchester Hills Specific Plan	2,063 acres	Bounded to the northeast by Matthews Rd., to the west by Briggs Rd., and to the south by Holland Road, approximately 1.9 miles southeast of the proposed IEEC.	Riverside County	Approved and adopted October 1997. An amendment for the project has been proposed by not yet approved. A maximum of 795 dwelling units have been planned and a tract map has been approved for the plan, but no start date for construction has been set.
Menifee Village Specific Plan	1,977 acres	Approximately 2 miles south of proposed IEEC	Riverside County	Approved and adopted in 1982, last amended September 2001. 3,847 units of a total 3,876 planned units have been constructed in this planning area.
Menifee Valley Ranch Specific Plan	1,548 acres	Approximately 2.2 miles southeast of the proposed IEEC, this is between Menifee Rd. to the west, Malaga Ave. to the east, McCall Blvd. to the north, and Simpson Rd. to the south.	Riverside County	Approved and adopted April 1997. 4,200 dwelling units have been proposed. 482 units have been constructed.
Source: CALPINE, 2001a; CALPINE, 2002a; RIVERSIDE, 2002b; RIVERSIDE, 2002c; Stamps, 2002.				

Discussions between staff and the City of Perris Planning Department indicate that projects in the area are largely on hold due to Riverside County's work on the countywide Multiple Species Habitat Conservation Plan (MSHCP). City of Perris Planning staff stated that the MSHCP had effectively curtailed the city's plans for developing a commercial area to the west of the proposed IEEC site (Blair, 2002b). In correspondence with the Riverside County Planning Department, County staff pointed out that the MSHCP is part of the larger general plan revision, the Riverside County Integrated Project (RCIP). County staff stated that while smaller projects are continuing to be approved, the County is advising the developers of larger scale projects such as

specific plans and large developments to wait until the RCIP has been completed before advancing their projects as the revision of the general plan could create major delays for projects.

The Romoland area is experiencing extensive residential growth, with continued growth expected for the next few years. In the vicinity of the proposed project in the Southern Perris Valley region, developers have plans for construction of large areas such as the Menifee North, Menifee Ranch, and Winchester Hills regions. These developments can be characterized as primarily mixed use with residential, commercial, and light industrial sectors. The proposed project is not expected to make a significant contribution to regional impacts related to new development and growth, such as population in-migration, and the resulting increased demand for public services, and extension of public infrastructure. The proposed IEEC is intended to meet the energy demands of the existing population and rapid growth within the area. The proximity of the project to proposed growth and development could contribute to cumulative future impacts on air quality, public health, visual resources, and noise. These impacts are addressed in greater detail in the **AIR QUALITY**, **PUBLIC HEALTH**, **VISUAL RESOURCES,** and **NOISE** Sections of the PSA.

The IEEC, in combination with other proposed projects in the region, is expected to contribute to a regional loss of open space and agricultural land. The acreage of agricultural land converted as a result of the proposed project is small relative to other projects in the County and would have minimal impact considering:

- The prime soils to be converted are not irrigated and as such cannot be considered Prime Farmland;
- The Department of Conservation lists the lands to be converted as Farmland of Local Importance, not Prime, Statewide, or Unique Farmland; and
- The parcels to be utilized by the IEEC have been given the Riverside County General Plan designation and County zoning for industrial uses, regardless of their historic agricultural uses.

As Riverside County has designated the IEEC site for industrial uses in its Comprehensive General Plan and Zoning Ordinance, and the land is not Prime, Statewide, or Unique Farmland, staff does not consider the project's contribution to a loss of open space and agricultural land to be cumulatively significant.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed IEEC power plant (please refer to **SOCIOECONOMICS Figure 1** in this Staff Assessment). However, as indicated in **SOCIOECONOMICS Figure 1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius; staff considers these to be pockets or clusters. Staff also reviewed Census 1990 information that shows the low-income population is less than fifty percent within the same radius. Because staff has determined there to be pockets or clusters of minority population within the six-mile radius, staff has conducted a focused environmental justice analysis for **Land Use**.

Based on the **Land Use** analysis, staff has not identified significant direct or cumulative impacts resulting from the construction or operation of the project, and therefore there are no **Land Use** environmental justice issues related to this project.

FACILITY CLOSURE

At some point in the future, the proposed facility would cease operation and close down. At that time, it would be necessary to ensure that closure occurs in such a way that public health and safety and the environment are protected from adverse impacts.

The planned lifetime of the IEEC is estimated at 30 years. At least twelve months prior to the initiation of decommissioning, the Applicant would prepare a Facility Closure Plan for Energy Commission review and approval. This review and approval process would be public and allow participation by interested parties and other regulatory agencies. At the time of closure, all applicable LORS would be identified and the closure plan would discuss conformance of decommissioning, restoration, and remediation activities with these LORS. All of these activities would fall under the authority of the Energy Commission.

There are at least two other circumstances under which a facility closure can occur, unexpected temporary closure and unexpected permanent closure. Staff has not identified any LORS from a land use perspective that the applicant would have to comply with in the event of unexpected temporary closure or unexpected permanent closure of the IEEC.

CONCLUSIONS

1. Staff believes that the project is consistent with the current development pattern for the area established by the Riverside County Comprehensive General Plan and its associated specific plans and community plans. With implementation of Conditions of Certification proposed throughout this PSA, the proposed project would be consistent with applicable Riverside County LORS provided in their March 5, 2002 letter.

2. The project would not disrupt or divide the physical arrangement of an established community.

3. The plant would not preclude or unduly restrict existing land uses, as it is consistent with the uses and general development pattern for the area. The project would not preclude or unduly restrict the conducting of agricultural land uses on neighboring properties or the operation of adjacent industrial facilities, as the project is consistent with the existing character of adjacent industrial and agricultural uses.

4. According to the California Department of Education, the project would preclude the Romoland School District's development of the planned Ashby Site approximately 900 feet south of the proposed IEEC. Given that a Risk Analysis Study for the Ashby Site has not been conducted, which would evaluate potential hazards from existing and planned industrial uses, and the potential availability of other sites for school

development in the project area, staff does not believe that the proposed IEEC's possible preclusion of the Ashby Site would be a significant impact.

5. With mitigation, operation of the project would not cause any significant noise, dust, public health, traffic, or visual impacts to nearby land uses, nor would the operation of the IEEC contribute substantially to any cumulative land use impacts. See the **NOISE**, **VISUAL RESOURCES**, **AIR QUALITY**, **PUBLIC HEALTH**, and **TRAFFIC AND TRANSPORTATION** Sections of the PSA for specific mitigation of impacts due to those issues.

6. Granting a variance from applicable height requirements for the HRSG stacks would allow the project site to be used in a manner enjoyed by other properties subject to M-H Zone requirements and be consistent with the intent and purpose of the M-H Zone and, therefore, would not constitute a grant of special privileges.

If the project is certified, Staff recommends that the Commission adopt the following proposed Condition of Certification.

PROPOSED CONDITION OF CERTIFICATION

LAND-1 Prior to the start of construction, the project owner shall obtain the necessary approval(s) from the County and complete any lot merger or lot line adjustments necessary to ensure that the proposed project, including associated facilities, improvements and buffer areas which would allow adjacent parcels to be developed to their full extent as presently zoned, will be located on a single legal lot.

Verification: 30 days prior to the start of construction, the Project Owner shall provide the CPM with proof of completion of the above adjustments or satisfactory evidence that no such adjustments are necessary.

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NOISE AND VIBRATION

Ron Brown

INTRODUCTION

The construction and operation of any power plant creates noise or unwanted sound. The character and loudness of this noise, the times of day or night that it is produced, and the proximity of the facility to sensitive receptors combine to determine whether a facility would meet applicable noise control laws and ordinances, and whether it would cause significant adverse environmental impacts. In some cases, vibration may be produced as a result of power plant construction, such as pile driving. The ground-borne energy of vibration has the potential to cause structural damage and annoyance.

The Inland Empire Energy Center (IEEC) would be located in Riverside County, near Romoland, California, just south of Highway 74 and east of I-215. The proposed project is the construction and operation of a 670-megawatt natural-gas-fired combined cycle power plant and associated natural gas compressor station. The project would include a connection to an SCE substation less than one mile east of the site, a connection to an existing natural gas line less than one mile to the east, and a connection to an existing water line near the southern boundary of the site.

The purpose of this analysis is to identify and examine the likely noise and vibration impacts from the construction and operation of this project, and to recommend procedures to ensure that these impacts would be adequately mitigated to comply with applicable laws, ordinances, regulations, and standards (LORS).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise exposure levels as a function of the amount of time during which the worker is exposed (see **Noise: Appendix A, Table A4** immediately following this section). The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed, assuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.

There are no federal laws governing off-site (community) noise.

The Federal Transit Administration (FTA) has published guidelines for assessing the impacts of ground-borne vibration associated with construction of rail projects, which have been applied by other jurisdictions to other types of projects. The FTA-recommended vibration standards are expressed in terms of the "vibration level," which is calculated from the peak particle velocity measured from ground-borne vibration. The

FTA measure of the threshold of perception is 65 VdB, which correlates to a peak particle velocity of about 0.002 inches per second (in/sec). The FTA measure of the threshold of architectural damage for conventional sensitive structures is 100 VdB, which correlates to a peak particle velocity of about 0.2 in/sec.

STATE

California Government Code Section 65302(f) encourages each local governmental entity to perform noise studies and implement a noise element as part of its General Plan. In addition, the California Office of Planning and Research has published guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure. The State land use compatibility guidelines are listed in **NOISE: Table 1**.

NOISE: Table 1
Land Use Compatibility for Community Noise Environment

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE – Ldn or CNEL (dB)													
	50		55		60		65		70		75		80	
Residential – Low Density Single Family, Duplex, Mobile Home														
Residential - Multi-Family														
Transient Lodging – Motel, Hotel														
Schools, Libraries, Churches, Hospitals, Nursing Homes														
Auditorium, Concert Hall, Amphitheaters														
Sports Arena, Outdoor Spectator Sports														
Playgrounds, Neighborhood Parks														
Golf Courses, Riding Stables, Water Recreation, Cemeteries														
Office Buildings, Business Commercial and Professional														
Industrial, Manufacturing, Utilities, Agriculture														

	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design.
	Normally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development generally should not be undertaken.

Source: State of California General Plan Guidelines, Office of Planning and Research, June 1990.

The State of California, Office of Noise Control, prepared a Model Community Noise Control Ordinance, which provides guidance for acceptable noise levels in the absence of local noise standards. The Model also contains a definition of a simple tone, or "pure tone," in terms of one-third octave band sound pressure levels that can be used to determine whether a noise source contains annoying tonal components. This Model further recommends that, when a pure tone is present, the applicable noise standard should be lowered (made more stringent) by 5 dBA.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. Section XI of Appendix G of CEQA Guidelines (Cal. Code Regs., tit. 14, App. G) sets forth some characteristics that may signify a potentially significant impact. Specifically, a significant effect from noise may exist if a project would result in:

a) 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;

b) exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

c) a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or

d) a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

The Energy Commission staff, in applying Item c) above to the analysis of this and other projects, has concluded that a potential for a significant noise impact may exist where the noise of the project plus the background exceeds the background by 5 dBA L_{90} or more at the nearest location where the sound is likely to be perceived.

Noise due to construction activities is usually considered to be insignificant in terms of CEQA compliance if:

1. The construction activity is temporary,
2. Use of heavy equipment and noisy activities is limited to daytime hours, and
3. All feasible noise abatement measures are implemented for noise-producing equipment.

Cal-OSHA

Cal-OSHA has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, §§ 5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards (**see NOISE: Appendix A, Table A4**).

LOCAL

Riverside County

The Comprehensive Riverside County General Plan defines the L_{dn} noise levels that are normally acceptable in residential areas as between 50 and 60 dBA. This same range is identified with respect to schools and other similar land uses.

The Menifee North Specific Plan dated 1997 identifies the maximum outdoor noise level of 65 dBA CNEL for residential land uses.

The County does not restrict the hours of construction.

SETTING

PROJECT BACKGROUND

The Inland Empire Energy Center (IEEC) involves the construction of a 670-megawatt (MW) natural gas fired combined-cycle power plant in Riverside County near Romoland, California.

The project will be located on a 46-acre parcel located just south of Romoland. The juncture of Interstate 215 and Highway 74 is approximately 1 mile west of the site.

Power Plant Site

This site is located in an area that is close to a small, medium density residential community. There is a population of 2,512 within a one-mile radius of the project site and the nearest residence is approximately 1,600 feet from the site. An elementary school is located at about 1,100 feet north of the site.

Linear Facilities

Additional linear facilities will consist of a new 0.9-mile natural gas pipeline, and a new water line connecting to a line just south of the site, both of which would be buried below ground. At the juncture of the new gas pipeline and the Sempra Energy line at Menifee Road, about 0.9 miles east, a compressor station will be added. New power transmission lines 0.9 miles in length will connect the plant to the SCE Valley Substation east of the site. None of these lines are near any noise sensitive receptors. Wastewater will be discharged through a new 4.7-mile pipeline connecting to a facility in Sun City, southwest of the plant site. This underground pipeline will traverse residential sections of Sun City.

EXISTING NOISE LEVELS

The applicant monitored ambient noise levels on June 13 and 14, 2001, at three of the closest noise sensitive receptors. These data were collected to provide estimates of the long-term noise environment in the vicinity of the project. The noise measurements were conducted using Larson-Davis Model 700 sound level meters meeting the requirements of the American National Standards Institute (ANSI S-1.4, 1983) for Type 1 Sound Level Meters. The microphones were placed approximately five feet off the ground and were protected with windscreens. Weather was hot with temperatures between 63 and 89 degrees Fahrenheit, and light winds. The dominant noise sources at these locations were primarily traffic on Highway 74 and local vehicular traffic. Noise levels recorded at these locations are listed in **Noise: Table 3**. The L_{90} values shown are the energy average of the six quietest consecutive hours during each period. It may be noted that at one location, the average L_{90} during the day period was lower than the night period.

Noise: Table 3
Long-Term Noise Measurement Summary

Monitoring Location	L_{dn}	Quietist (6 hr.) L_{90} in dBA	
		Day	Night
1 – NW Residence	62.2	50.1	42.2
2 – SW Residence	56.2	39.8	38.6
3 – Compressor Station	60.9	40.3	49.5

Source: Calpine Corp. 2001, AFC, Calculated from Table 5.9-3

An additional noise survey was conducted on January 29 and 30, 2002, at two different locations along Antelope Road, the eastern boundary of the Romoland community. The first location was across the street from the northwest corner of the Romoland Elementary School. The second location was at the intersection of Antelope Road and 3rd Street near the northeast corner of the majority of Romoland homes. Data from this second survey is shown in **Noise: Table 4** below. The noise levels at these two locations were similarly dominated by close proximity to vehicular traffic along Antelope Road. Based upon the two noise surveys, the lowest average L_{90} for the majority of the Romoland community that is away from the heavily traveled streets should be taken to be about 40 dBA.

Noise: Table 4
Second Long-Term Noise Measurement Summary

Monitoring Location	L_{dn}	Quietist (6 hr.) L_{90} in dBA	
		Day	Night
4 – Romoland School	64.1	49.0	44.9
5 – Antelope & 3rd St.	67.3	49.6	43.5

Source: Calpine Corp. 2002, Data Response, Calculated from Table 76-1

IMPACTS

Noise impacts associated with the project can be created by short-term construction activities, and by normal long-term operation of the power plant.

PROJECT SPECIFIC IMPACTS — CONSTRUCTION

Community Effects

General Construction Noise

Construction noise is a temporary phenomenon; the construction period for the IEEC facility is scheduled to last 24 months (Calpine 2001a, AFC, Page 1-2). Construction of an industrial facility such as a power plant is typically and unavoidably noisier than what is usually permissible under noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours is commonly exempt from enforcement by local ordinances. The County noise standard does not specifically address construction noise; the limits are based on levels of all noise sources at a receptor location.

The applicant has predicted the sound levels that could be expected at the nearest residence. Based on a sound level at 50 feet of 85 to 91 dBA for much of the construction activity, the sound level at the nearest residence would be between 48 and 59 dBA. These levels will be higher than the measured L_{90} ambient level of 40 to 50 dBA, and therefore will be audible but should not result in a significant noise impact.

Because construction activity and related traffic are regulated by the proposed Conditions of Certification, and are of limited duration, potential construction noise impacts to receptors in the IEEC project area are considered to be less than significant. In order to ensure that construction and operation of the project does not cause unacceptable impacts on nearby receptors, Energy Commission staff has proposed Conditions of Certification **NOISE-1** and **NOISE-2** to notify nearby residents of the work, and to provide a means of effectively registering complaints should project noise be unreasonable.

Pile Driving Vibration

Conventional pile driving produces potentially significant ground-borne vibration at nearby receivers. In this case, the nearest potentially affected structure is about 1,700 feet from the construction site, which is beyond the range over which pile driving vibration is expected to be potentially significant. Therefore, it is not expected that pile driving, if it occurs, will produce any significant vibration at the nearest receptors.

Steam Blows

Typically, the loudest noise encountered during construction, inherent in building any project incorporating a steam turbine, is created by the steam blows. After erection and assembly of the feedwater and steam systems, the piping and tubing that comprises the steam path has accumulated dirt, rust, scale and construction debris such as weld spatter, dropped welding rods and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. Traditionally, high pressure steam was then raised in the heat recovery steam generator (HRSG) or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, was quite effective at cleaning out the steam system. A series of short steam blows, lasting two or three minutes each, is performed several times daily over a period of two or three weeks. At the end of this procedure, the steam line is connected to the steam turbine, which is then ready for operation.

These high-pressure steam blows could produce noise as loud as 130 dBA at a distance of 100 feet. In order to reduce disturbance from steam blows, the steam blow piping could be equipped with a silencer that would reduce noise levels by 20 to 30 dBA, still an annoying noise level.

In recent years, a new, quieter steam blow process, variously referred to as QuietBlow™ or Silentsteam™, has become popular. This method utilizes lower pressure steam over a continuous period of 36 hours or so. Resulting noise levels

reach only about 80 dBA at 100 feet; noise levels at nearby receptors are typically similar to the ambient background noise level, and thus barely noticeable. Even more recently, compressed air has been substituted for steam in the continuous blow process; resulting noise levels are similar.

According to the applicant, un-silenced high pressure steam blow noise levels could be as high as 110 dBA at a distance of 100 feet. With an appropriate silencer, the noise levels could be reduced to a level of about 86 dBA at this same distance. The resulting noise level at the nearest receptor would be about 48 dBA, in the same range as the average L_{90} during daytime hours. Noise from the steam blow activity will likely be audible, but for the short duration of the events, the levels should not be objectionable.

The applicant has proposed to mitigate the noise generated from construction steam blows by use of a silencer similar to that described above. Energy Commission staff propose that any high pressure steam blows be muffled with an appropriate silencer, and that they be performed only during daytime hours to minimize annoyance to residents (see proposed Condition of Certification **NOISE-4**). If high pressure steam blows are utilized, the noise levels at the Romoland Elementary School would be less than 48 dBA and thus would be audible only during very quiet times of the day. If a low pressure steam blow process is utilized, the noise level at the school will be less than 40 dBA and should not be noticeable.

Energy Commission staff further propose a notification process to make neighbors aware of scheduled steam blows (see proposed Condition of Certification **NOISE-5**).

Linear Facilities

New off-site linear facilities will include gas and water lines, a wastewater disposal line, and a 500 kV power transmission line. Natural gas for the facility will be obtained from the Sempra Energy line at Menifee Road, about 0.9 miles east. At this location, the project will construct a compressor station to maintain pipeline pressure. Water for the project will be obtained from an existing line along the southern boundary of the site. A 4.7 mile wastewater disposal line will be constructed and connect to an existing system in Sun City. A 0.9 mile transmission line will connect to the SCE Valley substation east of the project site. Noise from these activities will be limited by adhering to the allowable hours of construction as cited in proposed Condition of Certification **NOISE-8**.

Worker Effects

The applicant has acknowledged the need to protect construction workers from noise hazards, and has recognized those applicable LORS that would protect construction workers (Calpine 2001a, AFC § 1.8.14 and 5.9.6.1). To ensure that construction workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-3**.

PROJECT SPECIFIC IMPACTS — OPERATION

Community Effects

The applicant has incorporated noise reduction measures into the design of the project and intends to achieve compliance with the noise performance requirements of all

applicable LORS (Calpine 2001a, AFC § 5.9.6). Compliance with LORS and mitigation measures will prevent a significant impact.

Power Plant Operation

During its operating life, the IEEC power plant represents essentially a steady, continuous noise source day and night. Occasional brief increases in noise levels would occur as steam relief valves open to vent pressure, or during startup or shutdown as the plant transitions to and from steady-state operation. At other times, such as when the plant is shut down for lack of dispatch or for maintenance, noise levels would decrease.

The primary noise sources at the proposed plant will consist of the gas turbine generators (GTG), the steam turbine generator (STG), the heat recovery steam generators (HRSG), boiler feedwater pumps and the cooling towers. Secondary noise sources include auxiliary pumps, ventilation fans, motors, valves and gas compressors. The noise emitted by power plants during normal operations is generally broadband, steady state in nature.

The Applicant has proposed to incorporate several noise control measures for specific equipment that are major noise-producing systems. These noise control measures have been incorporated in the near and far-field noise predictions.

The noise level from the proposed power plant was modeled to evaluate whether the new plant would contribute an incremental increase in noise levels at the nearest residential receptors. All major pieces of equipment were assumed to operate continuously for the purpose of the modeling analysis. The projected IEEC noise level at the closest residential receptors, north of the site, is a constant hourly L_{eq} of 45 dBA. Based on the results of the noise surveys performed on June 13th & 14th, 2001, and January 29th & 30th, 2002, the constant noise level at these locations will be above the existing lowest average nighttime L_{90} of 40 dBA, (See **NOISE: Table 3 and 4** above) and would result in a cumulative nighttime hourly L_{eq} of 45 to 46 dBA, an increase of 5 to 6 dBA above the lowest L_{90}. The project noise should only be noticeable during the quietest periods of the day and night at the closest residences. For residences at greater distances in the community, the noise level will be lower and should be largely unnoticeable.

Tonal and Intermittent Noises

One possible source of annoyance would be strong tonal noises. Tonal noises are individual sounds (such as pure tones) that, while not louder than permissible levels, stand out in sound quality. It is not expected that tonal noises will be generated during the operation of the project.

To ensure that no strong tonal noises are present and that intermittent noises are mitigated, Energy Commission staff has proposed a Condition of Certification **NOISE-6**, which requires the applicant to mitigate pure tones and the noise from steam relief valves.

Linear Facilities

The electrical output of the plant will be connected to the SCE Valley Substation approximately 0.9 miles east of the site (Inland Empire, 2001, AFC § 1.5). Noise from the transmission lines will include a corona discharge hum, which is expected to be audible within 100 feet of the power lines. The nearest residences are located about 1,600 feet from the transmission lines; they will be unable to hear the corona noise.

Near Menifee Road, where the gas line will be connected, a compressor station is to be built. A home is located about 600 feet north of this location. The average ambient L_{90} in this area is approximately 40 dBA. The applicant did not specifically address the predicted noise level of this facility in the AFC. Staff has determined that noise produced by this facility must not exceed 45 dBA at the nearest residence. This could produce a cumulative hourly L_{eq} of up to 46 dBA, a barely noticeable increase in the background ambient. All other linear facilities will be underground and thus will not impact the public; see proposed Condition of Certification **NOISE-6**.

Worker Effects

The applicant recognizes the need to protect plant operating and maintenance personnel from noise hazards, and has committed to comply with applicable LORS (Calpine 2001a, AFC § 5.9.6). Signs would be posted in areas of the plant with noise levels exceeding 85 dBA (the level that OSHA recognizes as a threat to workers' hearing), and hearing protection would be required. The applicant would implement a comprehensive hearing conservation program. To ensure that construction workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-7**.

CUMULATIVE IMPACTS

Section 15130 of the CEQA Guidelines (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the project alone.

Pursuant to CEQA, a cumulative impacts analysis can be performed by either 1) summarizing growth projections in an adopted general plan or in a prior certified environmental document, or 2) compiling a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment.

The AFC identified no planned projects that could contribute to cumulative noise impacts in the project study area (Calpine 2001a, AFC § 5.9.5), and staff knows of none. Therefore, no cumulative noise impacts are expected to occur as a result of the project.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows a population of 2,512 persons within a one-mile radius of the proposed IEEC, of which approximately 64 percent are persons of color. Within 2 miles, the population is 10,993 with a minority population of 33 percent. Due to the high percentage of minority population within one-mile of the site, where noise impact could be greater, staff has proposed mitigation measures in the Conditions of Certification to ensure that potential impacts will be reduced to less than significant levels. Based on the noise analysis, staff does not believe the noise impact will reach beyond the 2-mile project radius. Therefore, there is no potential disparate impact on the minority population, and there are no noise-related environmental justice issues associated with this project.

FACILITY CLOSURE

In the future, upon closure of the IEEC, all operational noise from the entire IEEC site would cease, and no further adverse noise impacts from operation of the IEEC would be possible. The remaining potential temporary noise source would be the dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise would be similar to that caused by the original construction of the IEEC, it can be treated similarly. That is, noisy work can be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise LORS that are in existence at that time would apply; applicable Conditions of Certification included in the Energy Commission Decision would also apply unless modified.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

Many comments have been received from the public and the Romoland School district regarding the proposed IEEC. Comments received from the public were almost unanimously positive. The Romoland School district believes the project will have an adverse affect on students at the elementary school. Staff believes that construction noise may be heard at the school but will not be a significant impact. The noise produced during plant operation will not be heard if all mitigation measures are applied to the project.

CONCLUSIONS AND RECOMMENDATIONS

Energy Commission staff concludes that the IEEC, with the recommended mitigation, will be built and operated to comply with all applicable noise laws, ordinances, regulations, and standards. Energy Commission staff further concludes that if the IEEC facility were designed as described above, and further mitigated as described below in the proposed Conditions of Certification, the IEEC is not expected to produce significant adverse noise impacts. To ensure compliance with all applicable noise LORS, Energy Commission staff recommends adoption of the following Conditions of Certification.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 At least 15 days prior to the start of ground disturbance, the project owner shall notify all residents within one mile of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours 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 be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: The project owner shall transmit to the Energy Commission Compliance Project Manager (CPM) in the first Monthly Construction Report following the start of ground disturbance, a statement, signed by the project manager, attesting that the above notification has been performed, and describing the method of that notification. This statement shall also attest that the telephone number has been established and posted at the site.

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project related noise complaints.

Protocol: The project owner or authorized agent shall:

- Use the Noise Complaint Resolution Form (see Exhibit 1), or functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
- Attempt to contact the person(s) making the noise complaint within 24 hours;
- Conduct an investigation to determine the source of noise related to the complaint;
- If the noise is project related, take all feasible measures to reduce the noise at its source; and
- Submit a report documenting the complaint and the actions taken. The report shall include a complaint summary, including final results of noise reduction efforts; and, if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

Verification: Within 5 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 the Riverside County Planning Department 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 3-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 ground disturbance, 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 and Cal-OSHA standards.

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

NOISE-4 If a traditional, high-pressure steam blow process is employed, the project owner shall equip steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 86 dBA measured at a distance of 100 feet. The noise level at the nearest residence produced by this operation must be less than 48 dBA. The project owner shall conduct high pressure steam blows only during the hours of 8 a.m. to 5 p.m., unless the CPM agrees to longer hours based on a demonstration by the project owner that offsite noise impacts will not cause annoyance.

If a low-pressure continuous steam blow process is employed, the project owner shall submit a description of this process, with expected noise levels and projected period of execution, to the CPM, who shall review the proposal with the objective of ensuring that the resulting noise levels do not exceed 40 dBA hourly Leq at the most-affected residence. If the low-pressure process is approved by the CPM, the project owner shall implement it in accordance with the requirements of the CPM.

Verification: At least 15 days prior to the first high-pressure steam blow, the project owner shall submit to the CPM drawings or other information describing the temporary steam blow silencer and the noise levels expected, and a description of the steam blow schedule. At least 15 days prior to any low-pressure continuous steam blow, the project owner shall submit to the CPM drawings or other information describing the process, including the noise levels expected and the projected time schedule for execution of the process.

NOISE-5 At least 15 days prior to the first steam or air blow(s), the project owner shall notify all residents within one-half mile of the site, and the principal of the Romoland School, of the planned activity, and shall make the notification available to other area residents in an appropriate manner.

The notification may be in the form of letters to the area residences, telephone calls, fliers or other effective means. The notification shall include a description of the purpose and nature of the steam or air blow(s), the proposed schedule, the expected sound levels, and the explanation that it is a one-time operation and not a part of normal plant operations.

Verification: Within 5 days of notifying these entities, the project owner shall send a letter to the CPM confirming that they have been notified of the planned steam or air blow activities, including a description of the method(s) of that notification.

NOISE-6 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the noise level produced by

operation of the project will not exceed an L_{eq} of 45 dBA measured at any residence.

No new pure tone components may be introduced. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints. Steam relief valves shall be adequately muffled to preclude noise that draws legitimate complaints.

Protocol:

A. Within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at Locations 1, 2, and 3. The noise survey shall also include short-term measurement of one-third octave band sound pressure levels at each of the above locations to ensure that no new pure-tone noise components have been introduced.

B. If the results from the two noise surveys (AFC vs. post-construction) indicate that the noise level due to the plant operations exceeds 45 dBA for any given hour during the 25-hour period, mitigation measures shall be implemented to reduce noise to a level of compliance with these limits.

C. If the results from the two noise surveys (AFC vs. post-construction) indicate that pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

Verification: Within 15 days after completing the post-construction survey, the project owner shall submit a summary report of the survey to the Riverside County Planning Department and to the CPM. Included in the post-construction survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. Within 15 days of completion of installation of these measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described above and showing compliance with this condition.

NOISE-7 Within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5099 (Article 105) and Title 29, Code of Federal Regulations, section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

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

NOISE-8 Noisy construction or demolition work shall be restricted to the times of day delineated below:

Weekdays	7 a.m. to 7 p.m.
Weekends and Holidays	8 a.m. to 5 p.m.

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

Horizontal drill rigs may be operated on a continuous basis, provided that the rigs are fitted with adequate mufflers and engine enclosures, and that the rigs are shielded from view of residences by berms, canal banks or other suitable barriers.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

Inland Empire Energy Center
(01-AFC-17)

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).

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NOISE: APPENDIX A
FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

To describe noise environments and to assess impacts on noise sensitive area, a frequency weighting measure, which simulates human perception, is customarily used. It has been found that A-weighting of sound intensities best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. **NOISE: Table A1** provides a description of technical terms related to noise.

Noise environments and consequences of human activities are usually well represented by an equivalent A-weighted sound level over a given time period (Leq), or by average day and night A-weighted sound levels with a nighttime weighting of 10 dBA (Ldn). Noise levels are generally considered low, when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. Outdoor day-night sound levels vary over 50 dBA depending on the specific type of land use. Typical Ldn values might be 35 dBA for a wilderness area, 50 dBA for a small town or wooded residential area, 65 to 75 dBA for a major metropolis downtown (e.g., San Francisco), and 80 to 85 dBA near a freeway or airport. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be levels of noise adverse to public health.

Various environments can be characterized by noise levels that are generally considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding average daytime levels. The day-to-night difference in rural areas away from roads and other human activity can be considerably less. Areas with full-time human occupation that are subject to nighttime noise, which does not decrease relative to daytime levels, are often considered objectionable. Noise levels above 45 dBA at night can result in the onset of sleep interference effects (USEPA 1971). At 70 dBA, sleep interference effects become considerable.

In order to help the reader understand the concept of noise in decibels (dBA), **NOISE: Table A2** has been provided to illustrate common noises and their associated sound levels, in dBA.

NOISE: Table A1 Definition of Some Technical Terms Related to Noise	
Terms	**Definitions**
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
L_{10}, L_{50}, & L_{90}	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L_{90} is generally taken as the background noise level.
Equivalent Noise Level, L_{eq}	The energy average A-weighted noise level during the Noise Level measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 4.8 decibels to levels in the evening from 7 p.m. to 10 p.m., and after addition of 10 decibels to sound levels in the night between 10 p.m. and 7 a.m.
Day-Night Level, L_{dn} or DNL	The Average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10 p.m. and 7 a.m.
Ambient Noise Level	The composite of noise from all sources, near and far. The normal or existing level of environmental noise at a given location.
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Pure Tone	A pure tone is defined by the Model Community Noise Control Ordinance as existing if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the two contiguous bands by 5 decibels (dB) for center frequencies of 500 Hz and above, or by 8 dB for center frequencies between 160 Hz and 400 Hz, or by 15 dB for center frequencies less than or equal to 125 Hz.

Source: California Department of Health Services 1976, 1977.

NOISE: Table A2 Typical Environmental and Industry Sound Levels			
Noise Source (at distance)	A-Weighted Sound Level in Decibels (dBA)	Noise Environment	Subjective Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		Very Loud
Very Loud Music	110	Rock Music Concert	
Pile Driver (50')	100		
Ambulance Sirent (100')	90	Boiler Room	
Freight Cars (50')	85		
Pneumatic Drill (50')	80	Printing Press Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center Department Store/Office	
Light Traffic (100')	50	Private Business Office	
Large Transformer (200')	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing

Source: Peterson and Gross 1974

Subjective Response to Noise

The adverse effects of noise on people can be classified into three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction.
- Interference with activities such as speech, sleep, and learning.
- Physiological effects such as anxiety or hearing loss.

The sound levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise effects in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction, primarily because of the wide variation in individual tolerance of noise.

One way to determine a person's subjective reaction to a new noise is to compare the level of the existing (background) noise, to which one has become accustomed, with the level of the new noise. In general, the more the level or the tonal variations of a new noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

With regard to increases in A-weighted noise levels, knowledge of the following relationships (Kryter 1970) can be helpful in understanding the significance of human exposure to noise.

1. Except under special conditions, a change in sound level of one dB cannot be perceived.
2. Outside of the laboratory, a three dB change is considered a barely noticeable difference.
3. A change in level of at least five dB is required before any noticeable change in community response would be expected.
4. A ten dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response.

Combination of Sound Levels

People perceive both the level and frequency of sound in a non-linear way. A doubling of sound energy (for instance, from two identical automobiles passing simultaneously) creates a three dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus three dB). The rules for decibel addition used in community noise prediction are:

NOISE: Table A3
Addition of Decibel Values

When two decibel Values differ by:	Add the following amount to the larger value
0 to 1 dB	3 dB
2 to 3 dB	2 dB
4 to 9 dB	1 dB
10 dB or more	0
Figures in this table are accurate to ± 1 dB.	

Source: Thumann, Table 2.3

Sound and Distance

Doubling the distance from a noise source reduces the sound pressure level by six dB.

Increasing the distance from a noise source ten times reduces the sound pressure level by 20 dB.

Worker Protection

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 to which the worker is exposed:

NOISE: Table A4
OSHA Worker Noise Exposure Standards

Duration of Noise (Hrs/day)	A-Weighted Noise Level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.5	110
0.25	115

Source: OSHA Regulation

PUBLIC HEALTH

Alvin J. Greenberg, Ph.D.

INTRODUCTION

The purpose of staff's public health Preliminary Staff Assessment is to determine if toxic emissions from the proposed Inland Empire Energy Center (IEEC) project will have the potential to cause significant adverse public health impacts or to violate standards for public health protection. If potentially significant health impacts are identified, staff will evaluate mitigation measures to reduce such impacts to insignificant levels.

Staff addresses potential impacts of regulated or criteria air pollutants in the **Air Quality** section of this Preliminary Staff Assessment (PSA). Impacts on public and worker health from accidental releases of hazardous materials are examined in the **Hazardous Materials Management** and **Worker Safety/Fire Protection** sections. Health effects from electromagnetic fields are discussed in the **Transmission Line Safety and Nuisance** section. Pollutants released from the project in wastewater streams to the public sewer system are discussed in the **Soils and Water Resources** section. Plant releases in the form of hazardous and nonhazardous wastes are described in the **Waste Management** section.

The following sections describe staff's method of analyzing potential health impacts and the criteria used to determine their significance.

METHOD OF ANALYSIS

Public health staff is concerned about toxic emissions to which the public could be exposed during project construction and routine operation. Following the release of toxic contaminants into the air or water, people may come into contact with them through inhalation, dermal (skin) contact, or ingestion via contaminated food or water.

Air pollutants for which no air quality standards have been set are called noncriteria pollutants. Unlike criteria pollutants such as ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide, noncriteria pollutants have no ambient (outdoor) air quality standards that specify levels considered safe for everyone.

Since noncriteria pollutants do not have such standards, a process known as health risk assessment is used to determine if people might be exposed to those types of pollutants at unhealthy levels. The risk assessment procedure consists of the following steps:

1. Identify the types and amounts of hazardous substances that the IEEC project could emit to the environment;

2. Estimate worst-case concentrations of project emissions in the environment using dispersion modeling;

3. Estimate amounts of pollutants to which people could be exposed through inhalation, ingestion, and dermal contact; and

4. Characterize potential health risks by comparing worst-case exposure to safe standards based on known health effects.

Initially, a screening level risk assessment is performed using simplified assumptions that are intentionally biased toward protection of public health. That is, an analysis is designed that overestimates public health impacts from exposure to project emissions. In reality, it is likely that the actual risks from the power plant will be much lower than the risks that are estimated by the screening level assessment. This is accomplished by examining conditions that would lead to the highest, or worst-case risks, and then using those in the study. Such conditions include:

- Using the highest levels of pollutants that could be emitted from the plant;
- Assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
- Using the type of air quality computer model which predicts the greatest plausible impacts;
- Calculating health risks at the location where the pollutant concentrations are calculated to be the highest;
- Using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses); and
- Assuming that an individual's exposure to cancer-causing agents occurs for 70 years.

A screening level risk assessment will, at a minimum, include the potential health effects from inhaling hazardous substances. Some facilities may also emit certain substances which could present a health hazard from noninhalation pathways of exposure (see CAPCOA 1993, Table III-5). When these substances are present in facility emissions, the screening level analysis includes the following additional exposure pathways: soil ingestion, dermal exposure, and mother's milk (CAPCOA 1993, p. III-19).

The risk assessment process addresses three categories of health impacts: acute (short-term) health effects, chronic (long-term) noncancer effects, and cancer risk (also long-term). Acute health effects result from short-term (1-hour) exposure to relatively high concentrations of pollutants. Acute effects are temporary in nature, and include symptoms such as irritation of the eyes, skin, and respiratory tract.

Chronic health effects are those which arise as a result of long-term exposure to lower concentrations of pollutants. The exposure period is considered to be approximately from ten to one hundred percent of a lifetime (from seven to seventy years). Chronic health effects include diseases such as reduced lung function and heart disease.

The analysis for noncancer health effects compares the maximum project contaminant levels to safe levels called "reference exposure levels" or RELs. These are amounts of toxic substances to which even sensitive people can be exposed and suffer no adverse

health effects (CAPCOA 1993, p. III-36). These exposure levels are designed to protect the most sensitive individuals in the population, such as infants, the aged, and people suffering from illness or disease which makes them more sensitive to the effects of toxic substance exposure. The RELs are based on the most sensitive adverse health effect reported in the medical and toxicological literature, and include margins of safety. The margin of safety addresses uncertainties associated with inconclusive scientific and technical information available at the time of standard setting and is meant to provide a reasonable degree of protection against hazards that research has not yet identified. The margin of safety is designed to prevent pollution levels that have been demonstrated to be harmful, as well as to prevent lower pollutant levels that may pose an unacceptable risk of harm, even if the risk is not precisely identified as to nature or degree. Health protection is achieved if the estimated worst-case exposure is below the relevant reference exposure level. In such a case, an adequate margin of safety exists between the predicted exposure and the estimated threshold dose for toxicity.

Exposure to multiple toxic substances may result in health effects that are equal to, less than, or greater than effects resulting from exposure to the individual chemicals. Only a small fraction of the thousands of potential combinations of chemicals have been tested for the health effects of combined exposures. In conformance with CAPCOA guidelines, the health risk assessment assumes that the effects of each substance are additive for a given organ system (CAPCOA 1993, p. III-37). In those cases where the actions may be synergistic (where the effects are greater than the sum), this approach may underestimate the health impact.

For carcinogenic substances, the health assessment considers the risk of developing cancer and assumes that continuous exposure to the cancer-causing substance occurs over a 70-year lifetime. The risk that is calculated is not meant to project the actual expected incidence of cancer, but rather a theoretical upper-bound number based on worst-case assumptions. In reality, the risk may generally be too small to actually be measured.

Cancer risk is expressed in chances per million, and is a function of the maximum expected pollutant concentration, the probability that a particular pollutant will cause cancer (called “potency factors”, and established by the California Office of Environmental Health Hazard Assessment), and the length of the exposure period. For example, a ten in one million risk level represents a ten in one million increase in the normal risk of developing cancer over a lifetime, at whatever location is estimated to have the worst-case risk. Cancer risks for each carcinogen are added to yield total cancer risk. The conservative nature of the screening assumptions used means that actual cancer risks are likely to be lower or even considerably lower than those estimated.

The screening analysis is performed to assess worst-case risks to public health associated with the proposed project. If the screening analysis predicts no significant risks, then no further analysis is required. However, if risks are above the significance level, then further analysis, using more realistic site-specific assumptions would be performed to obtain a more accurate assessment of potential public health risks.

SIGNIFICANCE CRITERIA

Commission staff determines the health effects of exposure to toxic emissions based on impacts to the maximum exposed individual. This is a person hypothetically exposed to project emissions at a location where the highest ambient impacts were calculated using worst-case assumptions, as described above.

As described earlier, non-criteria pollutants are evaluated for short-term (acute) and long-term (chronic) noncancer health effects, as well as cancer (long-term) health effects. Significance of project health impacts is determined separately for each of the three categories.

Acute and Chronic Noncancer Health Effects

Staff assesses the significance of non-cancer health effects by calculating a "hazard index." A hazard index is a ratio comparing exposure from facility emissions to the reference (safe) exposure level. A ratio of less than one signifies that the worst-case exposure is below the safe level. The hazard index for every toxic substance which has the same type of health effect is added to yield a total hazard index. The total hazard index is calculated separately for acute and chronic effects. A total hazard index of less than one indicates that cumulative worst-case exposures are less than the reference exposure levels (safe levels). Under these conditions, health protection is likely to be achieved, even for sensitive members of the population. In such a case, staff presumes that there would be no significant non-cancer project-related public health impacts.

Cancer Risk

Staff relied upon regulations implementing the provisions of Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986 (Health & Safety Code, §§ 25249.5 et seq.) for guidance to determine a cancer risk significance level. Title 22, California Code of Regulations, § 12703(b) states that "the risk level which represents no significant risk shall be one which is calculated to result in one excess case of cancer in an exposed population of 100,000, assuming lifetime exposure." This level of risk is equivalent to a cancer risk of ten in one million, or 10×10^{-6}. An important distinction is that the Proposition 65 significance level applies separately to each cancer-causing substance, whereas staff determines significance based on the total risk from all cancer-causing chemicals. Thus, the manner in which the significance level is applied by staff is more conservative (health-protective) than that which applies to Proposition 65. The significant risk level of ten in one million is consistent with the level of significance adopted by the various Air Boards in California pursuant to Health and Safety Code § 44362(b), which requires notification of nearby residents when an air district determines that there is a significant health risk from a facility.

The South Coast Air Quality Management District (SCAQMD) Risk Management Policy states that a project with an incremental cancer risk of one in one million or less is acceptable without further risk management consideration, and without further toxics reduction measures. In addition, the SCAQMD Risk Management Policy states that a project with an incremental cancer risk of between one and ten in a million is acceptable if best available control technology has been applied to reduce risk. In general, SCAQMD would not approve a project with a cancer risk exceeding ten in one million.

As noted earlier, the initial risk analysis for a project is typically performed at a screening level, which is designed to overstate actual risks, so that health protection can be ensured. When a screening analysis shows cancer risks to be above the significance level, refined assumptions would likely result in a lower, more realistic risk estimate. If facility risk, based on refined assumptions, exceeds the significance level of ten in one million, staff would require appropriate measures to reduce risk to less than significant. If, after all risk reduction measures had been considered, a refined analysis identifies a cancer risk greater than ten in one million, staff would deem such risk to be significant, and would not recommend project approval.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

Clean Air Act section 112 (42 U.S. Code section 7412)

Section 112 requires new sources that emit more than ten tons per year of any specified hazardous air pollutant (HAP) or more than 25 tons per year of any combination of HAPs to apply Maximum Achievable Control Technology (MACT).

STATE

California Health and Safety Code sections 39650 et seq.

These sections mandate the California Air Resources Board (CARB) and the Department of Health Services to establish safe exposure limits for toxic air pollutants and identify pertinent best available control technologies. They also require that the new source review rule for each air pollution control district include regulations that require new or modified procedures for controlling the emission of toxic air contaminants.

California Health and Safety Code section 41700

This section states that “no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”

California Code of Regulations, Title 5 (School Facilities Construction)

This section requires projects involving the purchase or construction of school sites to identify facilities within one-fourth mile of the site, which may emit hazardous air emission. This information along with test results and an analysis of the potential hazard to students and staff is required to be submitted with the Geological Hazards Report required by Education Code § 17212 and 17212.5 to the California Department of Education. Although not applicable to this project because it applies only to school siting processes and not the reverse (that is, it does not apply to siting industrial

facilities in proximity to schools), this regulation is listed here because the potential impact of this project on schools – both present and future – is of great importance.

LOCAL

South Coast Air Quality Management District (SCAQMD) Rule 1401

This rule requires a risk assessment or risk screening analysis to be performed for new or modified facilities that emit one or more toxic air contaminants that exceed specified amounts.

SETTING

This section describes the environment in the vicinity of the proposed project site from the public health perspective. Features of the natural environment, such as meteorology and terrain, affect the project's potential for causing impacts on public health. An emissions plume from a facility may affect elevated areas before lower terrain areas, due to a reduced opportunity for atmospheric mixing. Consequently, areas of elevated terrain can often be subjected to increased pollutant impacts. Also, the types of land use near a site influence the surrounding population distribution and density, which, in turn, affects public exposure to project emissions. Additional factors affecting potential public health impacts include existing air quality and environmental site contamination.

SITE AND VICINITY DESCRIPTION

The proposed site is located on approximately 45.8 acres located near the town of Romoland in unincorporated Riverside County. The site is located between Ethanac Road to the north and McLaughlin Road to the south with Antelope Road on its western boundary. The site is cultivated agricultural land currently used for growing wheat. The site topography is flat with an elevation of about 1,445 feet above sea level.

The town of Romoland is located in the Perris Valley of Riverside County. To the north-northwest of the project site, the Perris Valley extends for 12 miles to the March Air Reserve Base. Ranges of hills rise in all other directions from the project site. Adjacent land to the east, south and west of the project site is generally cropland. The area to the south of the site is sparsely populated while residential areas exist to the north of the project site in the community of Romoland. Land uses within one mile of the IEEC site include industrial, commercial, agricultural and residential.

The closest residential area lies approximately 200 yards north of the site's northern boundary. The closest school is located approximately 0.34 miles north of the proposed IEEC site. The unincorporated regions of Riverside County are rapidly growing, including the region of this proposed project. As mentioned above, the location of sensitive receptors near the proposed site is an important factor in considering potential public health impacts.

METEOROLOGY

Meteorological conditions, including wind speed, wind direction, and atmospheric stability, affect the extent to which pollutants are dispersed into ambient air as well as the direction of pollutant transport. This, in turn, affects the level of public exposure to emitted pollutants and associated health risks. When wind speeds are low and the atmosphere is stable, for example, dispersion is reduced and localized exposure may be increased.

The climate at the project site is dominated by the influence of the Pacific Ocean and the Pacific high-pressure system, which is a semi-permanent, subtropical high-pressure system located off the coast. The size and strength of the Pacific high is at a maximum during the summer, when it is at its northernmost position, and results in strong northwesterly airflow and negligible precipitation. During this period, inversions become strong, winds are light, and the pollution potential is high. The Pacific high's influence weakens during the fall and winter when it moves southwestward, which allows storms from the Gulf of Alaska to reach northern California. The annual rainfall is approximately 12 inches. About 85 percent of the region's annual rainfall occurs between November and March. During the winter, inversions are weak, winds often moderate, and the potential for air pollution is low.

Atmospheric stability is a measure related to turbulence, or the ability of the atmosphere to disperse pollutants due to convective air movement. Mixing heights (the height above ground level through which the air is well mixed and in which pollutants can be dispersed) are lower during mornings due to temperature inversions and increase during the warmer afternoons. Staff's **Air Quality** section presents more detailed meteorological data.

EXISTING AIR QUALITY

The proposed site is within the jurisdiction of South Coast Air Quality Management District (SCAQMD), which includes all or portions of Los Angeles, Orange, Riverside and San Bernardino counties.

By examining average toxic concentration levels from representative air monitoring sites in California with cancer risk factors specific to each contaminant, lifetime cancer risk can be calculated to provide a background risk level for inhalation of ambient air. For comparison purposes, it should be noted that the overall lifetime cancer risk for the average individual is about 1 in 4, or 250,000 in one million.

The toxic air monitoring station closest to the Inland project is in Rubidoux in Riverside County, approximately 20 miles from the IEEC site. Based on levels of toxic air contaminants measured at this monitoring station in 2000, the background cancer risk calculated for this location is 268 in one million (CARB 2002). The pollutants 1,3-butadiene and benzene, emitted primarily from mobile sources, were the two highest contributors to risk and together accounted for over half of the total. The risk from 1,3-butadiene was about 72 in one million, while the risk from benzene was about 79 in one million. Formaldehyde accounts for about 9 percent of the ambient cancer risk determined for Riverside, with a risk of about 23 in one million. Formaldehyde is emitted directly from vehicles and other combustion sources, such as the proposed

IEEC project. Hexavalent chromium accounts for 19% of the ambient risk, with a risk contribution of 52 in one million.

The use of reformulated gasoline, beginning in the second quarter of 1996, as well as other toxics reduction measures, have led to a decrease of ambient levels of toxics and associated cancer risk during the past few years. For example, at the Riverside monitoring station, cancer risk was 411 in one million based on 1993 data and 307 in one million based on 1996 data.

SITE CONTAMINATION

Site disturbances will occur during facility construction from excavation, grading, and earth moving. Such activities have the potential to adversely affect public health through various mechanisms, such as the creation of airborne dust, material being carried off-site through soil erosion, and uncovering buried hazardous substances.

On behalf of Inland Empire, a Phase I Environmental Site Assessment (ESA) was conducted by Foster Wheeler Environmental Corporation in accordance with American Society for Testing and Materials Standard E 1527-00, Standard Practice for Environmental Site Assessments (Calpine 2001a, Appendix H). The purpose of an ESA is to determine the potential for the presence or likely presence of any hazardous substances or petroleum products under conditions that may indicate a release or threat of a release from present or past activities. The results of the ESA are briefly summarized below, and in the **Waste Management** section. In addition, a database search was performed for potentially contaminated sites which may be encountered during construction of the linear facilities. These results are also summarized in the **Waste Management** section.

IMPACTS

CONSTRUCTION

Potential risks to public health during construction may be associated with exposure to toxic substances in contaminated soil disturbed during site preparation, as well as from heavy equipment operation. Criteria pollutant impacts from the operation of heavy equipment and particulate matter from earth moving are examined in staff's **Air Quality** analysis.

As described in the **Waste Management** section, a Phase I Environmental Site Assessment (ESA) has been performed. The ESA shows no evidence of significant site contamination.

The **Waste Management** section also discusses potentially contaminated sites which may be encountered during construction of the linear facilities. As noted in the **Waste Management** section, IEEC has proposed procedures to assure proper management of soil that might be contaminated when construction occurs in areas near suspected contamination.

The operation of construction equipment will result in air emissions from diesel-fueled engines. Although diesel exhaust contains criteria pollutants such as nitrogen oxides, carbon monoxide, and sulfur oxides, it also includes a complex mixture of thousands of gases and fine particles. These particles are primarily composed of aggregates of spherical carbon particles coated with organic and inorganic substances. Diesel exhaust contains over 40 substances that are listed by the U.S. EPA as hazardous air pollutants and by the Air Resources Board (ARB) as toxic air contaminants.

Exposure to diesel exhaust causes both short- and long-term adverse health effects. Short-term effects can include increased cough, labored breathing, chest tightness, wheezing, and eye and nasal irritation. Long-term effects can include increased coughing, chronic bronchitis, reductions in lung function, and inflammation of the lung. Epidemiological studies also strongly suggest a causal relationship between occupational diesel exhaust exposure and lung cancer.

Based on a number of health effects studies, the Scientific Review Panel on Toxic Air Contaminants (SRP) recommended a chronic REL (see REL discussion in Method of Analysis section above) for diesel exhaust particulate matter of 5 $\mu g/m^3$ and a cancer unit risk factor of $3x10^{-4}$ $(\mu g/m^3)^{-1}$ (SRP 1998, p. 6). The SRP did not recommend a value for an acute REL, since available data in support of a value was deemed insufficient. On August 27, 1998, the ARB listed particulate emissions from diesel-fueled engines as a toxic air contaminant and approved SRP's recommendations regarding health effect levels.

Construction of IEEC is anticipated to take place over a period of twenty-four months. As noted earlier, assessment of chronic (long-term) health effects assumes continuous exposure to toxic substances over a significantly longer time period, typically from seven to seventy years.

Appendix K-2 to the Application for Certification (AFC) presents diesel exhaust emissions from engines and fugitive dust from construction activities. Worst-case daily dust emissions of 50.2 lb/day PM10 are expected to occur in month five. Diesel emissions are generated from sources such as trucks, graders, cranes, welding machines, electric generators, air compressors, and water pumps. Modeling construction activities, which are assumed to occur for eight hours per day, gives a 24-hour maximum total predicted concentration of 261 $\mu g/m^3$ PM10 (121.8 $\mu g/m^3$ calculated added to a background of 139 $\mu g/m^3$) (Calpine 2001a, Table K.2-5). Mitigation measures are proposed to reduce the maximum calculated PM10 concentrations. These include the use of extensive fugitive dust control measures (stipulated by SCAQMD rule 403). The fugitive dust control measures are assumed to result in 90% reductions of emissions.

In order to mitigate potential impacts from particulate emissions during the operation of diesel-powered construction equipment, staff recommends the use of ultra low sulfur diesel fuel and the installation of soot filters on stationary diesel equipment. The catalyzed diesel particulate filters are passive, self-regenerating filters that reduce particulate matter, carbon monoxide, and hydrocarbon emissions through catalytic oxidation and filtration. The degree of particulate matter reduction is comparable for

both mitigation measures in the range of approximately 85-92 percent. Such filters will reduce diesel emissions during construction and reduce any potential for significant health impacts.

Operation

Emissions Sources

The emissions sources at the proposed IEEC project include two combustion turbine generators, two heat recovery steam generators, one condensing steam turbine generator, a natural gas-fired emergency generator, a diesel fire pump, and cooling tower. During operation, potential public health risks are related to diesel exhaust emissions from testing the natural gas combustion emissions from the gas turbines and duct burners, and diesel engine-driven fire pump engine.

As noted earlier, the first step in a health risk assessment is to identify potentially toxic compounds that may be emitted from the facility.

Diesel exhaust emissions contain a number of toxic compounds. However, a chronic REL and cancer risk factor have been established for diesel particulate matter which may be used to characterize emissions from diesel engines (please see the above discussion under **Construction Impacts**). The diesel engine used for the fire pump must be tested on a weekly basis in accordance with safety requirements, resulting in diesel particulate emissions that must be analyzed for health effects. The SCAQMD Risk Management Policy for Diesel Engines lists criteria for permitting stationary diesel engines, and states that if the annual emissions would result in an incremental cancer risk equal to or less than one in one million (measured at the point of maximum residential or off-site worker exposure) over an exposure period of 70 years, the project is acceptable without further risk management considerations.

Tables K-9-1 through K-9-4 of the AFC list non-criteria pollutants that may be emitted from IEEC project turbines, auxiliary boiler, cooling tower and fire pump as combustion byproducts, along with their anticipated amounts (emission factors). Emission factors are AP-42 emission factors, California Air Toxics Emission Factors (CATEF) emission factors and, for the auxiliary boiler, based on factors from the Ventura County Air Pollution Control District AB2588 emission factor summary document. Table 5.15-4 of the AFC lists toxicity values used to characterize cancer and noncancer health impacts from project pollutants. The toxicity values include reference exposure levels, which are used to calculate short-term and long-term noncancer health effects, and cancer unit risks, which are used to calculate the lifetime risk of developing cancer, as published in the CAPCOA Guidelines (CAPCOA 1993). **Public Health** Table 1 lists toxic emissions and shows how each contributes to the health risk analysis. For example, the first row shows that oral exposure to acetaldehyde is not of concern, but if inhaled, may have cancer and chronic (long-term) noncancer health effects, but not acute (short-term) effects.

Public Health Table 1
Types of Health Impacts and Exposure Routes Attributed to Toxic Emissions

Substance	Oral Cancer	Oral Noncancer	Inhalation Cancer	Noncancer (Chronic)	Noncancer (Acute)
Acetaldehyde			✔	✔	
Acrolein				✔	✔
Ammonia				✔	✔
Arsenic	✔	✔	✔	✔	✔
Benzene			✔	✔	✔
1,3-Butadiene			✔	✔	
Cadmium			✔	✔	
Chromium			✔	✔	
Copper				✔	✔
Ethylbenzene				✔	
Formaldehyde			✔	✔	✔
Hexane				✔	
Lead			✔	✔	
Mercury				✔	✔
Napthalene		✔		✔	
Nickel			✔	✔	✔
Polynuclear Aromatic Hydrocarbons (PAHs)	✔		✔		
Propylene				✔	
Propylene oxide			✔	✔	✔
Silver				✔	
Toluene				✔	✔
Xylene				✔	✔
Zinc				✔	

Source: AFC Table 5.15-4 using reference exposure levels and cancer unit risks from CAPCOA Air Toxics “Hot Spots” Program Revised 1992 Risk Assessment Guidelines, October 1993 and SRP 1998.

Emissions Levels

Once potential emissions are identified, the next step is to quantify them by conducting a “worst case” analysis. Maximum hourly emissions are required to calculate acute (one hour) noncancer health effects, while estimates of maximum emissions on an annual basis are required to calculate cancer and chronic (long-term) noncancer health effects.

The emergency fire pump engine's diesel exhaust particulate emission rate is 0.186 lb/hr (Calpine 2001a, Table K-9-4). Annual emissions are based on 200 hours of operation.

AFC Tables K-9-1 and K-9-2 show maximum hourly and annual emissions for the gas turbines and auxiliary boiler. The maximum fuel use is combined with the emission factor for each toxic air contaminant to estimate hourly and maximum annual emissions. Emission factors are estimates of the amounts of toxic substances released per unit of fuel burned and are from data compiled by the Ventura County Air Pollution Control District and the California Air Toxic Emission Factors (CATEF II) database maintained by the California Air Resources Board.

The next step in the health risk assessment process is to estimate the ambient concentrations of toxic substances. This is accomplished by using a screening air dispersion model and assuming conditions that result in maximum impacts. The screening analysis was performed using the U.S. EPA approved ISCST3 dispersion modeling program (please see staff's Air Quality section for a detailed discussion of the modeling methodology). Finally, ambient concentrations were used in conjunction with RELs and cancer unit risk factors to estimate health effects which might occur from exposure to facility emissions. Exposure pathways, or ways in which people might come into contact with toxic substances, include inhalation, dermal (through the skin) absorption, soil ingestion, consumption of locally grown plant foods, and mother's milk.

The above method of assessing health effects is consistent with the California Air Pollution Control Officers Association (CAPCOA) Air Toxics "Hot Spot" Program Revised 1992 Risk Assessment Guidelines (October 1993) referred to earlier, and results in the following health risk estimates.

Impacts

Dispersion modeling for diesel emissions from fire pump engine testing resulted in a maximum modeled annual impact on the northwest fenceline of the facility. That location has a cancer risk of 0.1 in one million, which is less than staff's ten in one million significance level. The area has a very low population density and an appropriate receptor will have lower risks than the modeled maximum. Since the health risk screening showed that the resulting risks are insignificant, the fire pump engine is exempt from SCAQMD permit requirements.

The screening health risk assessment for the project, including combustion and non-combustion emissions, resulted in a maximum acute hazard index of 0.1275 at the eastern project site boundary. The chronic hazard index at the point of maximum impact is 0.029. The location of the maximum chronic hazard is about 3,000 meters south of the proposed site (Calpine 2001a, Figure K-9-2). As **Public Health Table 2** shows, both acute and chronic hazard indices are under the REL of 1.0, indicating that no short- or long-term adverse health effects are expected.

Public Health Table 2
Operation Hazard/Risk

Type of Hazard/Risk	Hazard Index/Risk	Significance Level	Significant?
ACUTE NONCANCER	0.1275	1.0	No
CHRONIC NONCANCER	0.029	1.0	No
INDIVIDUAL CANCER	0.39×10^{-6}	10.0×10^{-6}	No

Source: Calpine 2001a, Table K-9-6, and response to workshop DR 79, page 15.

Cancer Risk

As shown in **Public Health Table 2**, total worst-case individual cancer risk is calculated to be 0.39 in one million at a location approximately 3,000 meters south of the project site. The original HRA was revised at staff's request to add the risk from "mothers milk" pathway (Inland 2002).

Maximum modeled cancer risk from the diesel fire pump engine is 0.1 in one million.

Cooling Tower

In addition to toxic air contaminants, the possibility (however remote) exists for bacterial growth to occur in the cooling towers, including Legionella. Legionella is a type of bacteria that grows in water (optimal temperature of 37° C) and causes Legionellosis otherwise known as Legionnaires' Disease.

Good preventative maintenance is very important in the efficient operation of cooling towers and other evaporative equipment (ASHRAE 1998). Preventive maintenance includes having effective drift eliminators, periodically cleaning the system if appropriate, maintaining mechanical components in working order, and maintaining an effective water treatment program with appropriate biocide concentrations. Staff notes that most water treatment programs are designed to minimize scale, corrosion, and biofouling and not to control Legionellae.

Untreated or inadequately treated cooling systems in the United States have been correlated with an outbreak of Legionellosis. These outbreaks are usually associated with building HVAC systems but it is possible for growth to occur in an industrial cooling tower.

The following management strategies are directed at minimizing colonization, amplification within the equipment, or both (ASHRAE 1998):

- Avoid piping that is capped and has no flow (dead legs).
- Control input water temperature to avoid temperature ranges where Legionellae grow. Keep cold water below 25° C (77° F) and hot water above 55° C (131° F).
- Apply biocides in accordance with label dosages to control growth of other bacteria, algae, and protozoa that may contribute to nutritional needs of Legionellae.

In order to ensure that the chances for Legionellae growth is kept to a minimum, staff proposes two Conditions of Certification **Public Health-1 & 2**. The first condition would require the project owner to prepare and implement a biocide monitoring program to ensure that proper levels of biocide are maintained within the cooling tower water at all times. The second proposed condition would require that all cooling tower fans be variable speed or two-speed. This will allow the project to run some fans at lower speed during the cooler months when full cooling is not needed rather than shut them off. Shutting off a fan may result in the water of the tower sitting at ambient temperature for a long enough time to promote bacterial growth. Staff believes that with the use of variable speed fans and an aggressive antibacterial program, the chances of Legionellae growing and dispersing would be reduced to near zero.

CUMULATIVE IMPACTS

The maximum cancer risk for the IEEC facility is 0.39 in one million, about 3,000 meters south of the proposed site, while the maximum risk from the diesel fire pump is 0.1 in one million.

The maximum impact location occurs where pollutant concentrations from IEEC would theoretically be the highest. Even at this location, staff does not expect any significant change in lifetime risk to any person, and the increase does not represent any real contribution to the average lifetime cancer risk of 250,000 in one million. Modeled facility-related residential risks are lower at more distant locations, and actual risks are expected to be much lower, since worst-case estimates are based on conservative assumptions, and overstate the true magnitude of the risk expected. Therefore, staff does not consider the incremental impact of the additional risk posed by the IEEC project to be either significant or cumulatively considerable.

The worst-case long-term noncancer health impact from IEEC (0.029 hazard index) is well below the significance level of 1.0 at the location of maximum impact. At this level, staff does not expect any cumulative health impacts to be significant. As with cancer risk, long-term hazard would be lower at all other locations, and cumulative impacts at other locations would also be less than significant.

Even in the unlikely event that worst-case emissions from an existing facility were to coincide both geographically and temporally with IEEC emissions at the location of maximum impact, the overall long-term health outlook would not change for anyone. Thus, the IEEC project will not result in any significant cumulative cancer or chronic noncancer health impacts.

ENVIRONMENTAL JUSTICE

In the **Socioeconomics** section of this Preliminary Staff Assessment, staff presents census tract information that shows less than 50% minority and low-income populations within six miles of the proposed project. Since staff has concluded that there will be no significant direct or cumulative public health-related impacts, there will also be no significant impact to any minority or low-income populations. Therefore, from a public health prospective, there are no environmental justice issues.

COMPLIANCE WITH LORS

Staff concludes that construction and operation of the IEEC project will be in compliance with all applicable LORS regarding long-term and short-term project impacts.

FACILITY CLOSURE

The scope of staff's public health analysis is limited to routine releases of harmful substances to the environment. During either temporary or permanent facility closure, the major concern would be from accidental or non-routine releases from either hazardous materials or wastes which may be onsite. These are discussed in the sections **Hazardous Materials** and **Waste Management**, respectively. During temporary closure (periods greater than those required for normal maintenance), it is unlikely that there would be any routine releases of harmful substances to the environment, since the facility would not be operating. For permanent closure, the only routine emissions would be related to facility demolition or dismantling, such as exhaust from heavy equipment or fugitive dust emissions. These would be subject to closure conditions adopted by the Energy Commission once a closure plan is received from the project owner.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

AGENCY COMMENTS

The California Department of Education and the Romoland School District

Comment: *The California Department of Education and the Romoland School District provided staff with regulations concerning School Facilities Construction, and were concerned about the proximity of the proposed IEEC to schools in the area.*

Response: As mentioned under LORS, the regulations provided by CDE apply only to school siting processes and not the reverse, that is, siting industrial facilities in proximity to schools. Nevertheless, California Health and Safety Code section 41700 and SCAQMD Rule 1401 require that industrial facilities demonstrate through conducting a Health Risk Assessment that there would be no significant risk to public health from their emissions. Therefore, even though the CDE regulations do not apply to the proposed IEEC, both the applicant and staff have conducted an analysis consistent with the CDE, state, and local regulations. Staff finds as a result of this analysis that no significant risk would be posed to the schools by emission from the proposed facility.

CONCLUSIONS

Staff has analyzed potential public health risks associated with construction and operation of the IEEC project, and does not expect any significant adverse cancer, or short- or long-term noncancer health effects from project emissions. Implementation of

Staff's proposed Conditions of Certification will also ensure that the risk of Legionellae growing and dispersing would be reduced to less than significant levels.

The health risk assessment performed by the applicant has been reviewed by CEC staff and was found to be in accordance with guidelines adopted by OEHHA (Office of Environmental Health Hazard Assessment), CARB and CAPCOA. Pursuant to the accepted Risk Management Policy, the increased carcinogenic risk attributed to this project is considered to be not significant since it is less than 10.0 in one million. The chronic hazard index attributed to the emission of non-carcinogenic air contaminants is considered to be not significant since it is less than 1.0. Therefore, the IEEC facility is in compliance with accepted Toxic Risk Management Policy and with the policies and regulations of the South Coast Air Quality Management District.

PROPOSED CONDITIONS OF CERTIFICATION

Public Health-1 The project owner shall develop and implement a cooling tower Biocide Use and Monitoring Program to ensure that the potential for bacterial growth is kept to an absolute minimum.

Verification: At least 60 days prior to the commencement of cooling tower operations, the Biocide Use and Monitoring Program shall be provided to the CPM for review and approval.

Public Health-2 The project owner shall install only variable speed (or two-speed) cooling tower fans. The fans shall be operated at least at the minimum speed at all times during plant operation to prevent the growth of Legionellae bacteria.

Verification: At least 60 days prior to the installation of cooling tower fans, the project owner shall provide the specifications of the fans to the CPM to ensure that the fans are of variable speed or two-speed. The project owner shall notify the CPM within two days if the fans are unable to be operated.

REFERENCES

ASHRAE 1998. American Society of Heating, Refrigeration, and Air Conditioning Engineers. Legionellosis: Position Paper. June 25.

California Air Resource Board. 2002. California Air Quality Data, http://www.arb.ca.gov/aqd/aqd.htm

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CAPCOA. 1993. California Air Pollution Control Officers Association. CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines. Prepared by the Toxics Committee. October.

FWEC (Foster Wheeler Environmental Corp/Booth). 2002d. Workshop Responses to CEC Staff Workshop Data Requests February 26, 2002. Submitted to the California Energy Commission, April 16, 2002.

SRP. 1998. Scientific Review Panel on Toxic Air Contaminants. Findings of the Scientific Review Panel on The Report On Diesel Exhaust as adopted at the Panel's April 22, 1998 Meeting.

SOCIOECONOMICS

Sue Walker

INTRODUCTION

This socioeconomic impact analysis evaluates the potential short- and long-term project-induced impacts on local housing, employment and population, schools, medical and protective services, and the fiscal and physical capability of local agencies to meet the needs of project-related population changes. The analysis includes demographic information, which is used in several technical areas for a focused evaluation of Environmental Justice, including this analysis. The socioeconomic analysis also discusses the potential direct, secondary (indirect and induced) and cumulative impacts of the proposed Inland Empire Energy Center (IEEC) on community resources and services.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

EXECUTIVE ORDER 12898

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," focuses federal attention on the environment and human health conditions of minority communities and calls on agencies to achieve environmental justice as part of this mission. The 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 issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

Civil Rights Act of 1964, Public Law 88-352, 78 Stat.241

(Codified as amended in various sections of 42 U.S.C.) Title VI of the Civil Rights Act prohibits discrimination on the basis of race, color, or national origin in all programs or activities receiving federal financial assistance.

STATE

California Government Code, Sections 65996-65997

As amended by SB 50 (Stats. 1998, ch. 407, sec. 23), these sections state that public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities, except the statutorily required school impact fees.

14 California Code of Regulations, Section 15131

The California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000 through 15387 provide the guidelines for implementation of the California Environmental

Quality Act (CEQA). Section 15131 provides direction for the evaluation of a proposed project's potential economic and social effects, including:

- Economic or social effects of a project shall not be treated as significant effects on the environment.
- Economic or social factors of a project may be used to determine the significance of physical changes caused by the project.
- Economic, social and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce and or avoid the significant effects on the environment.

REGIONAL

Southern California Association of Governments (SCAG)

The Southern California Association of Governments (SCAG) developed the Regional Comprehensive Plan and Guide (RCPG) to disclose issues related to future development in the Southern California Region, including: Los Angeles; Orange; San Bernardino; Riverside; Ventura; and, Imperial Counties. The RCPG is a composition of plans for the Southern California Region and serves as a guide for development within the Southern California Region. When preparing the RCPG, SCAG reviewed the applicable plans and policies of all local jurisdictions within the SCAG region to develop regional goals and policies. While no specific RCPG goals or policies are directly applicable to the IEEC, compliance with the RCPG as a whole would ensure the RCPG goal of guiding development within the Southern California Region.

SETTING

PROJECT LOCATION

The proposed IEEC site is located in Riverside County, approximately 6-miles west of the City of Hemet and approximately 30-miles southeast of the City of Riverside. The IEEC site is located near the communities of Romoland and Sun City, in an unincorporated portion of Riverside County. The site is currently used for agricultural purposes. For a full description of the site please refer to the **PROJECT DESCRIPTION** section of this Preliminary Site Assessment (PSA).

The study area (affected area), as defined in the socioeconomics section of the Application for Certification (AFC) (Calpine, 2001a), includes Los Angeles, Orange, Riverside, and San Bernardino Counties. The study area identified in the AFC was identified in the Electric Power Research Institute's report titled "Socioeconomic Impacts of Power Plants," which states that construction workers will commute as much as two hours to construction sites from their homes rather than relocate. Additionally, the report states operational workers will commute as much as one hour to a power plant site from their homes rather than relocate.

DEMOGRAPHIC CHARACTERISTICS

Within the regional study area, the City of Hemet and the County of Riverside are considered the primary areas that may be affected by potential population in-migration resulting from the proposed project. Because demographic information is unavailable for unincorporated areas, U.S. Census data for the nearby communities of Romoland and Sun City are not presented. Historic, recent, and projected population figures for Riverside County and the City of Hemet are summarized in **SOCIOECONOMICS TABLE 1**.

SOCIOECONOMICS TABLE 1
Recent and Projected Population Figures for the Study Area

Area	Year			
	1990[1]	2000[1]	2010[2]	2020[2]
Riverside County	1,170,413	1,545,387	2,159,700	2,773,400
City of Hemet	36,094	58,812	N/A	N/A

Sources:
[1] US Census: 1990 – 2000.
[2] Historical and Projected Population Figures from California Department of Finance, Demographic Research Unit, County Population Projection with Race/Ethnic Detail, Estimated July 1, 1990-1996 and projections from 1997 through 2040.
N/A – Not Available

Minority Population Characteristics

SOCIOECONOMICS TABLE 2 provides minority population percentages for the State, County of Riverside, and the City of Hemet as presented in the AFC. Staff's Environmental Justice screening analysis, described in the Impacts section of this analysis, is based on the ethnic/racial profile of the area within a six-mile radius of the project site. As shown in **SOCIOECONOMICS FIGURE 1,** the total population within a six-mile radius of the proposed IEEC is 86,306. Of this total 38,983 persons (45 percent) are categorized as minority.

Socioeconomics Table 2
Demographic Profile of Proposed Project Area, 2000

Race/Ethnicity	**Population**
State of California	
Total Population	**33,871,648**
White Alone Population	**15,816,790 (46.7%)**
Hispanic or Latino Population (of any race)	**10,966,556 (32.4%)**
People of Color*	**7,088,302 (20.9%)**
Riverside County	
Total Population	**1,545,387**
White Alone Population	**453,903 (29.4%)**
Hispanic or Latino Population (of any race)	**559,757 (36.2%)**
People of Color*	**531,727 (34.4%)**
City of Hemet	
Total Population	**58,812**
White Alone Population	**41,345 (70.3)**
Hispanic or Latino Population (of any race)	**13,585 (23.1)**
People of Color*	**3,882 (6.6)**

***People of Color includes Black, American Indian, Allaska Native, Asian, Native Hawaiin/Other Pacific Islander, Some Other Race, and Two or More Races and American Indian**
Source: U.S. Census Bureau, 2002.

PLACEHOLDER FOR SOCIOECONOMICS FIGURE 1
6-MILE RADIUS WITH CENSUS BLOCKS SHOWING MINORITY PERCENTAGE
2000

Low-Income Population Characteristics

Because certain 2000 U.S. Census economic data remains unavailable, staff uses 1990 Census data for its low-income analysis. In 1990, the percentage of the population living below the poverty level was 11.25 percent for the census block groups within a six-mile radius of the IEEC.

EMPLOYMENT AND ECONOMIC CHARACTERISTICS

SOCIOECONOMICS TABLE 3 identifies labor force characteristics for the four-county study area (Los Angeles, Riverside, Orange, and San Bernardino Counties) for the year 1999 from information supplied by the California Employment Development Department (EDD). The statistics for Los Angeles and Riverside Counties indicate a civilian labor force with an unemployment rate above the State's unemployment rate of 5 percent (CA EDD, 2001). Adjacent Orange and San Bernardino Counties show an unemployment rate below that of the entire State of California. The civilian labor force represents all residents between 16-55 years of age that are employable.

Socioeconomics Table 3
Labor Force Characteristics of Four-County Study Area, 1999

	Los Angeles County	Riverside County	Orange County	San Bernardino County
Civilian labor force	4,658,600	687,800	1,471,600	754,600
Unemployment	274,857 (5.9%)	37,829 (5.5%)	39,733 (2.7%)	36,220 (4.8%)
Agriculture	9,317	27,512	7,358	5,282
Construction	139,758	55,024	88,296	37,730
Manufacturing	745,376	82,536	250,172	98,098
Transportation/ public utilities	279,516	20,634	58,884	52,822
Trade	698,790	165,072	367,900	191,196
Finance/insurance	279,516	27,555	73,128	22,638
Services	1,490,752	192,584	421,189	188,650
Government	652,204	123,804	147,160	152,902
Other	363,371	48,047	57,073	5,282

Source: California Employment Development Dept., March 1999 benchmark.

SOCIOECONOMICS TABLE 3 indicates that services employ the highest proportion of any sector, while trade and manufacturing accounts for the second highest proportion of employment. The construction sector employs approximately 320,800 workers in the four-county study area. Recent statistics reported by the EDD for the month of May 2001 indicate that the Riverside-San Bernardino Metropolitan Service Area (MSA) had a total civilian labor force of 1,538,700 persons and an unemployment rate of 4.4 percent (EDD, 2001). In May 2001, the Riverside area employment showed a net increase of 0.3 percent in employment from the levels measured in March 2001, and a net increase of 1.3 percent in employment since May 2000. In May 2001, the EDD estimated that the construction sector employed 81,000 persons, an increase of 4.8 percent since May 2000, and that 51,300 were employed in the transportation and public utility sector, an increase of 1.4 percent since May 2000 (EDD, 2001)

SOCIOECONOMICS TABLE 4 provides total earnings, by County, for the study area as a whole for 1996 and 1997. Within Riverside County, the majority of employment earnings are generated in the service, retail, manufacturing, construction and

government industries. Construction employment represents approximately 4.5 percent of total employment earnings within the study area, and is concentrated primarily around residential and commercial development.

Socioeconomics Table 4
Non-Farm Earnings for the Study Area 1996 – 1997*

Industry	San Bernardino	Riverside	Los Angeles	Orange	Four-County Total	Percentage of Four-County Total
Services	4,359,801	3,846,167	69,720,311	17,656,717	95,582,996	34.9%
Wholesale Trade	1,038,327	564,054	12,741,333	5,418,342	19,762,056	7.2%
Retail Trade	2,139,676	1,739,828	15,134,083	5,346,569	24,360,156	8.9%
Manufacturing	2,283,124	1,721,409	28,928,996	10,636,397	43,569,926	15.9%
Government	3,335,280	2,751,353	21,793,746	5,265,875	33,476,254	12.2%
Transportation & Public Utilities	1,411,494	608,509	13,100,568	3,060,636	18,181,207	6.6%
Construction	1,212,587	1,357,784	6,446,561	3,308,447	12,325,379	4.5%
Finance, Ins. & Real Estate	936,703	754,351	16,159,000	6,435,627	24,285,681	9.0%
Agriculture	118,652	295,091	621,876	419,715	1,455,334	0.5%
Mining	46,834	28,483	465,141	83,826	624,284	0.3%
Total	17,212,478	13,667,029	185,111,615	57,632,151	273,623,273	100%

Source: Economic Development Department (EDD), Regional Economic Information System, 1999
* In thousands of dollars.

HOUSING

SOCIOECONOMICS TABLE 5 summarizes the housing unit totals for the City of Hemet and Riverside County as of January 1, 2000. As of January 2000, there were approximately 584,674 total housing units in Riverside County, with 29,401 total housing units within the City of Hemet. These totals include single-family, multi-family, and mobile home residences. Riverside County had a vacancy rate of 13.4 percent, while the City of Hemet had a vacancy rate of 14.1 percent. The vacancy rates for the City of Hemet and Riverside County are well above the federal housing standard of 5 percent.

SOCIOECONOMICS TABLE 5
Riverside County and City of Hemet Housing Units, 2000

		Single-Family		Multi-Family					
	Total	Detached	Attached	2-4	5+	Mobile Home	Occupied	Percent Vacant	Persons Per Household
City of Hemet	29,401	10,380	5,931	1,924	6,294	723	25,252	14.1%	2.26
Riverside County	584,674	236,046	112,486	49,038	103,757	4,891	506,218	13.4%	2.98

Source: 2000 US Census

UTILITIES, EMERGENCY AND PUBLIC SERVICES

The East Municipal Water District (EMWD) provides wastewater collection, treatment, and disposal services in the project area. Sewage is collected locally and transported by sewers to one of five Regional Water Reclamation Facilities (RWRF) within the EMWD service area. The RWRFs provide tertiary sewage treatment through a pure oxygen activated sludge process and chemical disinfection. The treated effluent is

stored on site before much of it is sold for municipal, agricultural, or public use (EMWD, 2001).

The EMWD supplies potable water in and around the communities surrounding the proposed project; the IEEC site is included in this service area. The Urban Water Management Plan (EMWD, 2000) describes the water system analysis, identifies improvements to correct existing deficiencies, and provides a framework to serve future growth. The EMWD utilizes a variety of water supplies to meet the needs of its customers. Current supplies include imported water purchased from the Metropolitan Water District of Southern California (MWD), imported seasonal storage, locally produced groundwater, desalinated groundwater, and transfers. These programs, in conjunction with continued expansion of EMWD's water recycling program, provide a high degree of supply flexibility in meeting the growing demand for water within the EMWD service area.

Police service in most parts of Riverside County is provided by the Riverside County Sheriff's Department. In 2001, the Riverside County Sheriff's Department stated that the average response time for calls in the unincorporated portions of Riverside County was approximately 15 minutes. The Riverside County Sheriff station serving the IEEC area is the Perris substation, located at 403 East 4th Street in the unincorporated City of Perris. Average response time to calls in the vicinity of the proposed IEEC is estimated at no longer than 15 minutes from this station (Deluney, 2001).

Emergency medical services are provided by Riverside County sheriff and fire units and local ambulance services. There are a number of emergency hospitals in the Riverside area that can provide most types of routine and emergency medical treatment, including intensive care. The closest emergency medical facility to the proposed IEEC site is the Menifee Valley Medical Center, located at 28400 McCall Boulevard in Sun City, approximately one mile away.

The IEEC project area is served by the Romoland School District and Perris Union High School District.

The Romoland School District maintains two facilities within the community of Romoland. Romoland Elementary School is located at 25890 Antelope, and Harvest Valley Elementary School is located at 29955 Watson Road. Both schools are elementary education facilities, serving kindergarten through eighth grade. During the 2000-2001 school year, attendance at the two schools totaled 1,417 students (Calpine, 2002). During the 2001-2002 school year attendance at the two schools totaled 1,586 students (Calpine, 2002). The District has stated that both schools, at certain grade levels, are over capacity, and that additional schools within the area will be needed to accommodate both existing and future student enrollment projections (Skumawitz, 2002). The District currently projects that enrollment will increase to 3,901 students over the next five years (Calpine, 2002).

The Perris Union High School District (PUHSD) maintains six facilities in Perris Valley. Total enrollment within the district is approximately 6,000 students (Calpine, 2001a). Children attending either of the two elementary education facilities within the Romoland School District would attend Perris High School, located at 175 East Nuevo Road in the

nearby City of Perris. At the time of this writing, staff does not know if these schools are below, at, or above capacity; however, a data request for this information has been submitted to the Applicant.

FISCAL

Construction of the estimated $325-400 million IEEC project would result in annual property tax payments to Riverside County which would be dispersed to local and regional funds. The purchase of construction materials would result in sales tax revenues to be distributed to local, regional, and state funds for the purposes of debt service and to cover operating expenses. Because the IEEC would be located within an unincorporated area, the applicable local agency with taxing powers would be Riverside County. Its current and projected revenue is indicated in **SOCIOECONOMICS TABLE 6**.

Socioeconomics TABLE 6
Riverside County Annual Budget

	2000-2001	2001-2002
Riverside County	$4.3 Billion	$6.1 Billion
Source: Riverside County; 2001		

IMPACTS

STAFF'S CRITERIA FOR DETERMINING IMPACT SIGNIFICANCE

In evaluating socioeconomic impacts, staff determined that a significant impact could occur if the proposed project would:

- Induce substantial population growth in the study area, either directly (for example, by proposing new homes or businesses) or indirectly (for example, through extension of roads or other infrastructure);
- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere;
- Have substantial fiscal and/or economic effects on local government, employment, property and sales taxes and business;
- Result in substantial adverse physical impacts associated with the provision of new or physically altered facilities which could cause significant environmental impacts in order to maintain acceptable service ratios, response times, or other performance objectives for local police protection, school capacity, or other public service operations.

DISCUSSION OF IMPACTS

Population

Construction of the proposed IEEC project could affect the population of the area during construction only if a substantial number of workers had to relocate to the area. However, as indicated in **SOCIOECONOMICS TABLE 7,** the average construction workforce of 250 persons is an insignificant portion of the total construction workforce of approximately 81,000 within the Riverside-San Bernardino Metropolitan Service Area

(EDD, 2000). The Riverside-San Bernardino Building Trades Council (RSBTC) coordinates labor union activities and oversees the allocation of appropriately skilled workers for construction projects in the Riverside area. The RSBTC estimates that a labor pool of 10,000 skilled construction workers would be available for construction of the proposed project during the scheduled 2002 to 2004 construction period. (Calpine, 2001a). Calpine has proposed in its AFC, and staff recommends adopting, a Condition of Certification (SOCIO-2) that requires a local hiring and procurement preference policy for the project. Therefore, the IEEC would not contribute to a significant increase in population in Riverside County or the neighboring communities.

A sufficient number of qualified personnel are expected to be available in the area to fill most of the IEEC's operational positions. However, to assess the potential for long-term population impacts, the worst-case scenario of five operational employees relocating to the area is used to determine the impact. As stated in **SOCIOECONOMICS TABLE 5**, the most recent household figures for Riverside County identifies 2.98 persons per household. Using this figure, the worst-case assumption for in-migration resulting from operation of the IEEC would be 15 persons.

The worst-case scenario of 15 persons relocating to the Riverside area would account for less than .00001 percent of the most recent population of 1,545,387 persons residing in Riverside County. While these additional persons could locate near the proposed IEEC site, they would likely be dispersed throughout the Riverside area. Given the small size of the proposed operational workforce, and the minimal impact of the worst-case induced population figure resulting from the operational workforce, impacts resulting from population in-migration would be less than significant.

Employment and Economy

Staff does not expect construction of the IEEC to begin in August 2002 as originally stated in the AFC. Construction of the proposed project is expected to last approximately 24 months, beginning in early 2003 and ending approximately in the first quarter of the year 2005. Once construction begins, it would provide job opportunities for an average of 250 construction workers. The maximum construction workforce required for completing the IEEC would be approximately 508 workers for a maximum of 4 months. **SOCIOECONOMICS TABLE 7** provides a summary of the skilled labor by craft needed throughout the construction of the IEEC.

SOCIOECONOMICS TABLE 7
NUMBER OF WORKERS, BY CRAFT

Trade	Total Workers Available In Riverside-San Bernardino MSA – 2004[1]	Maximum Number of Workers Needed[2]	Average Number of Workers Needed
Boiler Makers	3,680	106	58
Carpenters	11,460	32	13
Electricians	10,350	73	31
Iron Workers	3,780	48	22
Laborers	13,120	32	14
Pipe Fitters	2,780	71	31
Painters/Insulation	11,930	40	18
Bricklayers/Masons	5,520	2	2
Millwrights	4,820	21	15
Operating Engineers	5,380	23	17
Contractor Staff	8,180	60	29
TOTAL	81,000	508	250

[1] Data from the State of California, Employment Development Department, Labor Market Information, Table 6, Occupational Employment Projections 1997-2004. Total workers calculated from the 1995 EDD estimated workforce for Riverside-San Bernardino MSA. (EDD 2000)
[2] The maximum number of workers by each craft would be needed at different points in time during project construction.

Payrolls for project construction employees would have a positive impact on the area. In estimating the economic impact of these construction jobs, an average annual salary, including benefits, of $50,000 for each construction-related employee was assumed. An average of 250 construction workers would be employed during construction of the IEEC for 24 months, so the estimated average payroll would be approximately $25 million (Calpine, 2001a). This revenue is considered a positive impact to the community.

Upon completion of the IEEC, it is estimated that approximately 23 people would be permanently employed at the site. The operational workforce would be drawn from the local area and from within the Applicant's organization. A local hiring policy would be followed. It is estimated that less than five employees with specialized skills and expertise to operate the electrical generation equipment would need to be recruited from outside the local area (Calpine 2001a). The worst-case scenario of five employees relocating to the Riverside area is not expected to create a significant adverse impact.

Operational payroll for the IEEC would have a positive impact on the surrounding community. Annual operational payroll, including salary, overtime, benefits, and incentives, is estimated to be $1.3 million.

Secondary effects of the project include both indirect and induced effects. Indirect effects include employment income changes in inter-industry purchases as they respond to the new demands of those industries directly affected by the IEEC. Induced effects represent the response by all local industries caused by the expenditures of new household income generated by the direct and indirect effects due to the changes in final demand for a given industry.

The Applicant estimated local and regional employment and income effects of the IEEC using an Impact Planning (IMPLAN) input-output model. The IMPLAN relies upon "multipliers" to evaluate the secondary economic and employment benefits of a proposed project. These multipliers reflect the estimated increase in local and regional

employment and income that result from each dollar or employee added to the area due to the project. Multipliers typically range from 1.2 to 2.5 (California Environmental Protection Agency, 1994).

The estimates of the Applicant's IMPLAN model were based upon Type I and Type II Multipliers. The Type I Multiplier was defined as direct plus indirect effects divided by direct effects (Calpine, 2001e). The Type II Multiplier was defined as direct plus indirect plus induced effects divided by direct effects. For construction, the Applicant's multipliers for employment were 1.45 (Type I) and 1.91 (Type II). For construction-related income, the multipliers were 1.36 (Type I) and 1.69 (Type II) (Calpine, 2001e). For operation, the Applicant's multipliers for employment were 1.96 (Type I) and 3.08 (Type II), and the income multipliers were 1.41 (Type I) and 1.8 (Type II) (Calpine, 2001e). These multipliers are within the approximate range that staff has determined to be appropriate.

According to the Applicant's estimates for the Industrial and Commercial sectors of construction in Riverside County, the indirect income generated by the project would be $5,156,250, and the induced income would be $5,193,750 for the first year of construction (Calpine, 2001e). In the second year of construction, the indirect income generated by the project would be $3,437,500, and the induced income would be $3,462,500 (Calpine, 2001e). The total two-year indirect and induced income generated by project construction would be $8,593,750 and $8,656,250, respectively. The combined direct, indirect and induced income generated by the facility during construction is estimated to be $42,250,000 (Calpine, 2001e). This increase in local and regional income is considered to be a positive impact.

During operation of the IEEC, the total indirect income is anticipates to be $538,109 and the induced income is estimated to be $503,191 (Calpine, 2001e). The combined direct, indirect and induced income during annual operation of the project is anticipated to be $2,341,300 (Calpine, 2001e). As above, this increase in local and regional income is considered to be a beneficial impact.

During the first year of IEEC construction, the Applicant estimated that an additional 133 indirect and 139 induced jobs would be created, and that in the second year of construction 87 indirect and 93 induced jobs would be created (Calpine, 2001e). Including direct employment for construction (500 employees), the project would thus generate 952 jobs (Calpine, 2001e). These additional employment positions are considered a beneficial impact to the local and regional area.

During operation of the IEEC, the Applicant estimated that 22 indirect and 26 induced jobs would be created (Calpine, 2001e). Including the 23 new positions directly created for plant operation, the IEEC would thus create 71 direct, indirect and induced jobs (Calpine, 2001e). The additional employment positions generated by operation of the IEEC would be both a local and regional beneficial impact.

Housing

The proposed IEEC project site does not contain any existing housing within its boundaries. Therefore, no displacement of existing housing would occur.

Based on information provided in the AFC and summarized in **SOCIOECONOMICS TABLE 7**, there are enough construction workers/laborers available within the four-county area to meet the demands of project construction. As a result, the demand for housing within the study area is not expected to increase appreciably as a result of the proposed project because the vast majority of the work force is expected to commute from within a two-hour distance of the project site.

Under the worst-case operation scenario, 15 persons would relocate to Riverside County, resulting in a demand for 5 additional housing units. Based on information provided in **SOCIOECONOMICS TABLE 5**, the most recent vacancy rate for Riverside County is 13.4 percent. That number equates to approximately 78,456 available housing units within Riverside County. Within the City of Hemet the vacancy rate is 14.1 percent, which equates to approximately 4,116 available housing units. Therefore, even under a worst-case scenario, adequate housing would be available for these operations personnel based on current vacancy rates. No significant impact would occur on the demand for housing in Riverside County. Therefore, no replacement or additional housing would have to be constructed as a result of the proposed project.

Utilities, Emergency And Other Public Services

The project would not directly or indirectly induce substantial population growth in the area. Any short-term increase in population due to construction activities is considered to be minimal, with adequate numbers of construction workers currently residing within the project area. Physical impacts to public services and utilities are usually associated with population in-migration and growth in an area, which increase the demand for a particular service leading to the need for expanded or new facilities. An increase in population in any given area may result in the need to develop new, or alter existing, government facilities to accommodate increased demand. As an electric generation project with few long term employees, the proposed project is not expected to result in an increase in the population of the area.

Electricity, natural gas, water, and wastewater connections to the proposed project would be supplied via new infrastructure within the capacity of existing service providers. No constraints would be placed on any current public service providers as a result of the proposed project. No adverse physical impacts associated with the provision of public facilities (new or altered) would occur.

In the event that emergency services are required, adequate facilities are available within approximately one mile of the project site. The proposed project would have private security and for existing police protection personnel, equipment and response times are considered adequate. The proposed project would not increase demand for police protection services. In addition, as referenced above, no significant population increase requiring new services would result from construction or operation of the IEEC. It is not expected that the proposed project would increase the use of existing police facilities such that a substantial physical deterioration, alteration, or expansion of these facilities would occur. Therefore, no significant impacts on police protection services would occur as a result of the IEEC.

Construction of the proposed IEEC project could affect the population of the area during the construction period if a substantial number of workers had to relocate to the area.

However, as indicated above, the average construction workforce of 250 persons is anticipated to commute to the site; consequently, no significant population increase that could adversely affect student enrollment of the Romoland School District and Perris Union High School District is anticipated. Operations of the proposed IEEC facility could result in a worst-case scenario of 15 persons relocating to the Riverside area. While these additional persons could locate near the proposed IEEC site, they would likely be dispersed throughout the Riverside area and would not likely impact these Districts alone. It is additionally noted that both Districts have applied for the State's School Facilities Program funding for new construction of additional schools and/or modernization of existing schools to accommodate existing and projected student populations (Calpine, 2002). Therefore, staff currently believes that no significant impact would occur relative to the Romoland School District or the Perris Union High School District. However, a final determination cannot be made until the Applicant fully responds to the data request submitted in April 2002 regarding school capacity.

The IEEC project would be required to pay applicable property taxes and the required statutory facility fee associated with the issuance of a building permit. The Romoland School District and Perris Union High School District have a total school impact fee of $0.33 per square foot for commercial and industrial development. The proposed IEEC covered and closed structures would total approximately 12,600 square feet, which results in a $4,158 school impact fee to be paid by the IEEC (see Condition of Certification SOCIO-1).

Public Finance and Fiscal

Based on the approximate $325 to 400 million capital cost of the proposed IEEC facility, Riverside County would initially expect to receive approximately $4.0 million in additional property tax annually. Based on current tax distribution rates, the distribution of the property tax dollars is provided in **SOCIOECONOMICS TABLE 8**. This distribution would not be affected by AB 81, as discussed below.

SOCIOECONOMICS TABLE 8
POTENTIAL DISTRIBUTION OF ANNUAL PROPERTY TAXES PAID BY IEEC

Property Tax Distribution[1]	Percent	Tax
County Free Library	2.943	$117,723
County Structure Fire Protection	6.336	$253,421
Eastern Municipal Water Implementation District 13	0.924	$36,975
Eastern Municipal Water Adjacent	5.184	$207,353
Flood Control Administration	0.289	$11,550
Flood Control Zone 4	4.760	$190,389
General	30.396	$1,215,840
Mount San Jacinto Junior College	4.279	$171,170
Perris Area Elementary School Fund	10.373	$414,936
Perris Union Junior High School	6.921	$276,862
Perris Union High School	19.275	$770,991
Perris Valley Cemetery	0.225	$8,993
Riverside County Regional Park and Open Space	0.460	$18,392
Riverside County Office of Education	4.541	$181,637
Romoland School	3.070	$122,806
San Jacinto Basin Resource Conservation	0.024	$962
Total	**100**	**$4,000,000**

[1] Tax Rate Area 70-000
Source: Riverside County Tax Allocation Office, 2000

Under a law recently signed by the Governor, Assembly Bill 81 (AB 81), the responsibility for property tax assessment for the IEEC

property and other large power plant properties will shift from local jurisdictions to the State Board of Equalization (BOE) by making them " state assessed properties." This will require annual reassessment at fair market value, and provide that property tax collected be distributed exclusively to the taxing jurisdictions within the Tax Rate Area in which the facility is located. (A " Tax Rate Area" is a grouping of properties within a county wherein each parcel is subject to the taxing powers of the same combination of taxing agencies). While AB 81 could substantially increase total property tax revenue derived from the IEEC over its lifespan, local governments, school and other special districts in the IEEC Tax Rate Area will continue to receive the property tax revenue from the property at the same percentage of the total that they currently receive from property that is locally assessed by the County Assessor in that same Tax Rate Area.

The BOE has amended its Rule 905 (Assessment of Electric Generation Facilities) to provide that, as of January 1, 2003 and commencing with the lien date for the 2003-2004 fiscal year, electric generation facilities 50 megawatts or larger, owned or used by an electrical corporation, as defined by Public Utilities Code, will be assessed by the State. Certain small qualifying facilities and qualifying cogeneration facilities are excluded.

During construction of the proposed project, an estimated $5 to10 million would be spent on local purchases (Calpine, 2001a). These local purchases would contribute to the local economy, including the sales tax base. Sales taxes, which would be applied to goods purchased in California, will be taxed at a rate of 7.50 percent beginning in the year 2003. The sales taxes to be paid by the IEEC on an estimated $5 to 10 million in local purchases would result in total sales taxes between $375,000 to $750,000, resulting in a potential tax distribution shown in **SOCIOECONOMICS TABLE 9**.

SOCIOECONOMICS TABLE 9
POTENTIAL DISTRIBUTION OF ANNUAL SALES TAXES PAID BY IEEC

Sales Tax Distribution	Tax Rate	Amount of Tax
County General Fund	1.00%	$50,000 to $100,000
Local Funds	0.25%	$12,500 to $25,000
Riverside County Transportation Commission	0.50%	$25,000 to $50,000
State of California	5.75%	$287,500 to $575,000
Total	7.50%	$375,000 to $750,000
Source: State Board of Equalization, 2001 Franchise Tax Board, 2001		

In addition to increased tax revenues, local and regional spending by the IEEC would stimulate the creation of new jobs in the Riverside area and would have a positive fiscal and economic impact on the local area.

CUMULATIVE IMPACTS

The potential for cumulative socioeconomic impacts exists when there are other projects proposed in the region that have overlapping construction schedules and project operations that could impact similar resources. Although the Riverside County area has been experiencing growth that has placed demands on the construction

industry, the average construction workforce of 250 persons for the IEEC is an insignificant portion of the area's construction workforce of approximately 10,000. The annual income and property tax revenues generated by the IEEC are expected to provide additional public resources and potential improvements that would outweigh any short-term impacts associated with project construction. Overall, no adverse cumulative socioeconomic impacts are expected to occur from the construction or operation of the proposed IEEC facility at either a local or regional level.

ENVIRONMENTAL JUSTICE SCREENING ANALYSIS

The purpose of the environmental justice screening analysis is to determine whether there exists a low-income and/or minority population within the potentially affected area of the proposed site. Staff conducted the screening analysis in accordance with the "Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis" (Guidance Document) dated April 1998. Minority populations, as defined by this Guidance Document, are identified where either:

- the minority population of the affected area is greater than fifty percent of the affected area's general population; or
- the minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

Energy Commission staff has determined the potential affected area as a six-mile radius of the proposed IEEC site. The six-mile radius is consistent with the radius used for staff's cumulative air quality analysis. When a minority and/or low-income population is identified per the above, staff in the technical areas of air quality, public health, hazardous materials, noise, water, waste, traffic and transportation, visual resources, land use, socioeconomics and transmission line safety and nuisance consider possible impacts on the minority/low-income population as part of their analysis. This environmental justice (EJ) analysis consists of identification of significant impacts (if any), identification of mitigation, and a determination of whether there is a disproportionate impact if an unmitigated significant impact has been identified. Staff's environmental justice approach includes providing notice (in appropriate languages) of the proposed project and opportunities for participation in public workshops to minority and/or low-income communities, and providing information on staff's EJ approach to minority and/or low-income persons who attend staff's public workshops.

MINORITY POPULATION CHARACTERISTICS

Census 2000 information on racial demographics presented in **SOCIOECONOMICS TABLE 2** for Riverside County indicates that approximately 29.4 percent of the County's population is white alone. **SOCIOECONOMICS FIGURE 1** depicts the distribution of the white and minority populations within a six-mile radius of the project site.

Within the six-mile radius of the site, 54.8 percent of the total population is non-Hispanic white, while the remaining 45.2 percent is minority. Within this radius there are multiple census blocks with a greater than 50 percent minority population, the majority of which are associated with the communities of Perris and Romoland. Within a one-mile radius

of the IEEC site, 64 percent of the population is minority. However, based upon field reconnaissance of the project area, the vast majority of these census blocks are sparsely populated, the exception being the community of Romoland. Conversely, within a two-mile radius of the project site, the minority population percentage decreases to 33 percent.

Although the minority population is less than 50 percent within the six-mile radius of the project site, there are many census blocks with greater than 50 percent minority population. Staff considers these pockets which require a focused Environmental Justice analysis. Staff concludes that there are no significant adverse socioeconomic impacts; therefore, there are no Environmental Justice issues related to socioeconomics.

LOW-INCOME POPULATION CHARACTERISTICS

The low-income population evaluation was performed using data from the 1990 census because comparative data from the Census 2000 has not been released and was not available at the time that this document was prepared. As discussed previously, the total percentage of individuals within a six-mile radius of the proposed IEEC project site living under the poverty level was 11.25 percent. Additionally, within a six-mile radius of the project site, there were no “pockets” where more than 50 percent of the people living in the area are under the poverty level. Even though the percentage of people living under the poverty level was well below staff’s 50 percent threshold for triggering a focused Environmental Justice analysis, one was done due to the pockets of high percentage minority population.

FACILITY CLOSURE

UNEXPECTED TEMPORARY CLOSURE

Should the IEEC be temporarily shutdown or closed, there would be no significant socioeconomic impacts. The applicant would conduct a review to determine if there had been any environmental damage or release of hazardous materials. If not, the IEEC could be “mothballed.” Before the IEEC begins commercial operation, the applicant would develop a contingency plan to deal with premature or unexpected closures. This would include communication with the Energy Commission and local agencies regarding the schedule of facility closure and compliance with LORS.

PLANNED CLOSURE

In the event that a decision is made to permanently close the facility, the applicant would develop a plan for decommissioning and submit it to the Energy Commission and other appropriate agencies for review and approval. The plan would include compliance with all applicable LORS. Should the plant be permanently closed, the beneficial socioeconomic impacts such as worker payroll, project expenditures, and property and other tax revenues would no longer occur. This would have a significant adverse impact on local tax revenues.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff believes that the IEEC would not cause a significant adverse direct, indirect, or cumulative impact on housing, schools, employment, public finance, or public services. The proposed project would not induce significant population growth in the area, nor would it involve the displacement of housing or people. Therefore, the project would not result in any significant socioeconomic impacts to population, housing, schools, or public services.

Although minority and low income populations exist in the vicinity of the proposed power plant site, staff has not identified any significant unmitigated adverse socioeconomic effects associated with the proposed project. Therefore, there are no socioeconomic environmental justice issues.

RECOMMENDATIONS

If the Energy Commission certifies the proposed project, staff recommends adoption of the following conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner shall pay the one-time statutory school development fee as required at the time of filing for the in-lieu building permit with the Riverside County Building Department.

Verification: The project owner shall provide proof of payment of the statutory development fee in the next Monthly Compliance Report following the payment.

SOCIO-2 The project owner and its contractors and subcontractors shall recruit employees and procure materials and supplies within the Riverside-San Bernardino MSA first, unless:

- to do so will violate federal and/or state statutes;
- the materials and/or supplies are not available;
- qualified employees for specific jobs or positions are not available; or
- there is a reasonable basis to hire someone for a specific position from outside the Riverside–San Bernardino MSA.

Verification: At least 60 days prior to site mobilization, the project owner shall submit to the CPM copies of contractor, subcontractor, and vendor solicitations and guidelines stating hiring and procurement requirements and procedures. In addition, the project owner shall notify the CPM by letter of the reasons for any planned procurement of materials or hiring outside the Riverside-San Bernardino MSA that will occur.

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SOIL AND WATER RESOURCES

Greg Peterson and John Kessler

INTRODUCTION

This section analyzes potential effects on soil and water resources of the Inland Empire Energy Center (IEEC), as proposed by Calpine Corporation (Applicant). The analysis specifically focuses on the potential for the project to cause impacts in the following areas:

- Whether construction or operation will lead to accelerated wind or water erosion and sedimentation.
- Whether the project will exacerbate flood conditions in the vicinity of the project.
- Whether the project's demand for water will adversely affect surface or groundwater supplies.
- Whether project construction or operation will lead to degradation of surface or groundwater quality.
- Whether the project will comply with all applicable laws, ordinances, regulations and standards

Where the potential for impacts is identified, staff has proposed mitigation measures to reduce the significance of the impact and, as appropriate, has recommended conditions of certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Clean Water Act

The Clean Water Act (33 USC § 1257 et seq.) requires states to set standards to protect water quality through the regulation of point source and certain non-point source discharges to surface water. These discharges are regulated through requirements set forth in specific or general National Pollutant Discharge Elimination System (NPDES) permits. Stormwater discharges during construction and operation of a facility, and incidental non-stormwater discharges associated with pipeline construction also fall under this act, and are addressed through a general NPDES permit. In California, requirements of the Clean Water Act regarding regulation of point source discharges and storm water discharges are delegated to, and administered by, the nine Regional Water Quality Control Boards (RWQCB).

Section 404 Permit to Place or Discharge Dredged or Fill Material

Section 404 of the Clean Water Act regulates the discharge of dredged or fill material into waters of the United States, including rivers, streams and wetlands. The Army

Corps of Engineers (ACOE) issues site-specific or general (nationwide) permits for such discharges.

Section 401 Water Quality Certification

Section 401 of the Clean Water Act provides for state certification that federal permits allowing discharge of dredged or fill material into waters of the United States will not violate federal and state water quality standards. These certifications are issued by the RWQCBs. Proposed linear facilities can cross ephemeral drainages that are considered waters of the United States.

STATE

California Constitution, Article X, Section 2

This section requires that the water resources of the State be put to beneficial use to the fullest extent possible. The waste, unreasonable use, or unreasonable method of use of water is prohibited. The conservation of such waters is to be exercised with a view to the reasonable and beneficial use in the interest of the people and for the public welfare. The right to water or to the use or flow of water in or from any natural stream or water course in the State is and shall be limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not and shall not extend to the waste or unreasonable use, or unreasonable method of use, or unreasonable method of diversion of water. This section is self-executing, and the Legislature may also enact laws in the furtherance of the policy contained in this section.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1967, Water Code Section 13000 et seq., requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards and implementation procedures. The criteria for the IEEC are contained in the Santa Ana Regional Water Quality Control Plan. These standards are typically applied to the proposed project through the Waste Discharge Requirements (WDRs) permit. The Porter-Cologne Water Quality Control Act also requires the SWRCB and nine RWQCBs to ensure the protection of water quality through the regulation of waste discharges to land. Such discharges are regulated under Title 23, California Code of Regulations, Chapter 15, Division 3. These regulations require that the RWQCB issue Waste Discharge Requirements specifying conditions regarding the construction, operation, monitoring and closure of the waste disposal site, including injection wells and evaporation ponds for waste disposal.

California Water Code

Section 13551 of the Water Code prohibits the use of "…water from any source of quality suitable for potable domestic use for non-potable uses, including …industrial… uses, if suitable recycled water is available…" given conditions set forth in Section 13550. These conditions take into account the quality and cost of the water, the potential for public health impacts and the effects on downstream water rights, beneficial uses and biological resources.

Section 13552.6 of the Water Code specifically identifies that the use of potable domestic water for cooling towers, if suitable recycled water is available, is an unreasonable use of water. The availability of recycled water is based upon a number of criteria that must be taken into account by the SWRCB. These criteria are that: the quality and quantity of the reclaimed water are suitable for the use; the cost is reasonable, and the use is not detrimental to public health, will not impact downstream users or biological resources, and will not degrade water quality.

Section 13552.8 of the Water Code states that any public agency may require the use of recycled water in cooling towers if certain criteria are met. These criteria include that recycled water is available and meets the requirements set forth in Section 13550, the use does not adversely affect any existing water right, and if there is public exposure to cooling tower mist using recycled water, appropriate mitigation or control is necessary.

The Safe Drinking Water and Toxic Enforcement Act of 1986, Health and Safety Code section 25249.5 et seq., prohibits the discharge or release of chemicals known to cause cancer or reproductive toxicity into drinking water sources.

California Code of Regulations Title 23, Division 3, Chapter 16 governs the installation and maintenance of underground storage tanks. These regulations are intended to protect waters of the state from discharges of hazardous substances from underground storage tanks by establishing construction and monitoring requirements for new underground storage tanks, and are administered by the Regional Water Quality Control Boards.

Tertiary Wastewater Treatment Permit

Under Title 22 of the California Code of Regulations, the California Department of Health Services reviews and approves wastewater treatment systems to meet treatment standards. California Title 22 recognizes that there are different recycled water uses, and depending on the risk of human contact, different treatment standards are permissible. For industrial cooling, Title 22 reclaimed water needs to be a minimum of disinfected secondary-23 (Most Probable Number of 23 coliform bacteria/100ml). For unrestricted use of reclaimed water, such as in a distribution network serving multiple users, tertiary treatment is required to meet a standard of 2.2 MPN/100 ml.

STATE POLICIES

State Water Resources Control Board

The SWRCB has also adopted a number of policies that provide guidelines for water quality protection. The principle policy of the SWRCB which addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power plant Cooling (adopted by the Board on June 19, 1976 by Resolution 75-58). This policy states that fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. This SWRCB policy requires that power plant cooling water should come from, in order of priority: wastewater being discharged to the ocean, ocean water, brackish water from natural sources or irrigation

return flow, inland waste waters of low total dissolved solids, and other inland waters. This policy also addresses cooling water discharge prohibitions.

State Water Resources Control Board Resolution No. 68-16 (the "Anti-Degradation Policy") declares the State's policy that, among other things, the discharging of wastes will not pollute or result in a nuisance.

State Water Resources Control Board Resolution 77-1 encourages and promotes reclaimed water use for non-potable purposes. The California legislature's Water Recycling Act of 1991 makes the following findings and declarations;

- The State is subject to periodic drought conditions.
- The development of traditional water resources in California has not kept pace with the State's population, which is growing at the rate of over 700,000 per year and which is anticipated to reach 36 million by the year 2010.
- There is a need for a reliable source of water for uses not related to the supply of potable water to protect investments in agriculture, green belts, and recreation, and to replenish groundwater basins, and protect and enhance fisheries, wildlife habitat, and riparian areas.
- The environmental benefits of recycled water include a reduced demand for water in the Sacramento-San Joaquin Delta, which is otherwise needed to maintain water quality, reduced discharge of waste into the ocean, and the enhancement of groundwater basins, recreation, fisheries, and wetlands.
- The use of recycled water has proven to be safe from a public health standpoint, and the State DHS is updating regulations for the use of recycled water.
- The use of recycled water is a cost-effective, reliable method of helping to meet California's water supply needs.
- The development of the infrastructure to distribute recycled water will provide jobs and enhance the economy of the state.
- Retail water suppliers and recycled water producers and wholesalers should promote the substitution of recycled water for potable water and imported water in order to maximize the appropriate cost-effective use of recycled water in California.
- Recycled water producers, retail water suppliers, and entities responsible for groundwater replenishment should cooperate in joint technical, economic, and environmental studies, as appropriate, to determine the feasibility of providing recycled water service.
- Retail water suppliers and recycled water producers and wholesalers should be encouraged to enter into contracts to facilitate the service of recycled and potable water by the retail water suppliers in their service areas in the most efficient and cost-effective manner.
- Recycled water producers and wholesalers and entities responsible for groundwater replenishment should be encouraged to enter into contracts to facilitate the use of recycled water for groundwater replenishment if recycled water is available and the authorities having jurisdiction approve its use.

- Wholesale prices set by recycled water producers and recycled water wholesalers, and rates and retail water suppliers are authorized to charge for recycled water, should reflect an equitable sharing of the costs and benefits associated with the development and use of recycled water.Local

County of Riverside

The County of Riverside specifies criteria for Grading and Erosion Control and for design of storm water facilities associated with the proposed IEEC project. The County also assesses a Flood Mitigation Fee in accordance with Riverside County's Homeland/Romoland Area Drainage Plan (ADP) to assist in providing revenue for establishing adequate community drainage facilities (Riverside 2002a).

Eastern Municipal Water District

EMWD requires a Service Agreement for providing a host of water and wastewater services proposed for the IEEC project. The Service Agreement will include Recycled Water for supplying process and cooling water, Potable Water for domestic and fire protection, Process Wastewater to be discharged into the Non-Reclaimable Waste Line, and Sanitary Wastewater service.

ENVIRONMENTAL SETTING

REGIONAL AND VICINITY DESCRIPTION

The Applicant proposes to build the Inland Empire Energy Center (IEEC), a 670 MW combined cycle plant, southeast of the community of Romoland in southwestern Riverside County. In relation to larger communities, the proposed IEEC site is located southeast of Perris, and northeast of Sun City. The Applicant proposes to construct the IEEC within 35 acres of a 45.8-acre parcel being acquired by the Applicant. Existing uses on the IEEC site include dry-land agriculture for the production of wheat. Two Southern California Edison (SCE) transmission lines, one 500 kV and the other 161 kV, cross the southernmost portion of the IEEC site in an east-west direction. Characterized by flat topography, the proposed site is located off of Ethanac Road, with Antelope Road running north to south along the western boundary, and McLaughlin Road running east to west along the southern boundary.

Land use in the vicinity of the IEEC is primarily agriculture, intermixed with commercial, industrial and rural residential uses in the immediate vicinity. Medium-density residential development is concentrated in and near the community of Romoland, located approximately ¼ mile north of the site, and in Sun City located approximately 3 miles southwest of the site. Romoland School is located approximately ¼ mile north of the site. Major landmarks near the proposed project include SCE's Valley Substation located approximately ¾ miles east of the site, and the Burlington Northern and Santa Fe (BNSF) Railroad traversing diagonally along the northeast boundary of the IEEC site (Calpine 2001a, AFC Sections 1.5, 1.8 & 5.7).

Several new linear facilities will also be required. Please refer to **PROJECT DESCRIPTION Figure 3** for an illustration of the proposed linear facilities. The preferred routes for each are described as follows:

1. The Recycled Water Pipeline, as proposed for supply from EMWD's integrated regional water reclamation facilities (RWRF), would consist of approximately 0.1 mile of new 24-inch diameter pipeline. The pipeline would connect to an existing 48-inch recycled water pipeline located in McLaughlin Road adjacent to the project's southern boundary, and run north on Antelope Road to the IEEC site.

2. The Non-Reclaimable Wastewater Pipeline, as proposed for discharge of IEEC process wastewater, would consist of approximately 4.7 miles of 12 to 18-inch new pipeline. The new pipeline would connect into an existing non-reclaimable wastewater pipeline in Sun City, and follow north along Murrieta Road, east along McLaughlin Road, and north on Antelope Road to the IEEC site.

3. The Sanitary Sewer Pipeline, as proposed for discharge of sanitary wastes and backwash wastewater from the microfiltration system, would consist of approximately 0.1 miles of new pipeline. The new pipeline would connect to an existing 33-inch diameter sewer line on McLaughlin Road near the southern property boundary of the IEEC site, and run north on antelope Road.

4. The Domestic Water Pipeline, would consist of approximately 0.5 mile of 8-inch pipeline. The pipeline would run north-south along Antelope Road providing a loop connection between State Highway 74 to the north and McLaughlin Road to the south, along the western boundary of the IEEC site.

5. The Natural Gas Pipeline, would consist of approximately 0.9 miles of 30-inch pipeline, with the point of interconnection being PG&E's Sempra Mainlines 1027, 1028 and 6900, located on Menifee Road. The interconnection is located southeast of the IEEC site, and the pipeline would run westward for approximately 1/8th mile before being pressurized in a new Compressor Station. The new Natural Gas Pipeline would then run north to near the BNSF Railroad, then traverse diagonally to the northwest parallel to the tracks, then westward along McLaughlin Road and finally northward on Antelope Road to the IEEC (CALPINE 2001a, AFC Section 3.0 & Figure 3.2-2).

6. The 500 kV Transmission Line, would consist of approximately 0.9 miles of transmission line from a new switchyard proposed to be on-site at IEEC to Southern California Edison's (SCE's) Valley Substation located east of the IEEC site. The new transmission line will exit from the southern boundary of the IEEC site, run to the east along McLaughlin Road crossing over the BNSF Railroad, and then into the Valley Substation. A section of an existing SCE 115 kV transmission line will also have to be relocated as a result of the new 500 kV transmission line.

In addition to the Recycled Water Pipeline, infrastructure improvements to EMWD's RWRF would include a new Recycled Water Pump Station at the Moreno Valley RWRF, providing EMWD the ability to pressurize an existing gravity pipeline for supply to IEEC, and providing EMWD more flexibility in the operation of its overall RWRF. Supply of recycled water will be further reinforced with the proposed addition of a Supplemental Raw Water Pump Station to be located within the grounds of EMWD's new Perris Water Treatment Plant (WTP), which is currently under construction. Raw fresh water as

supplied from the Colorado River Aqueduct would be pumped into the recycled water system up to a capacity of 7.4 mgd as needed to supplement recycled water supply. The new Recycled Water Pump Station at the Moreno Valley RWRF and the new Supplemental Raw Water Pump Station at Perris WTP should meet Title 22 standards for redundant equipment and backup power supply (IEEC 2002c, Data Request #115 & Figure 115-1).

SOILS

As stated above, the 45.8-acre site being acquired by the Applicant was previously used for dry-land agriculture for the production of wheat and serves as the corridor for two SCE transmission lines along the southern boundary. Although 35 acres will clearly no longer be available for agricultural use, the Applicant has indicated that the remaining 10.8-acre portion of the parcel could be returned to agricultural use following construction. Based on the draft Grading Plans, the existing grade for the IEEC site ranges from 1448 to 1439 feet above mean sea level (MSL), and gently drains to the west and southwest. The power plant will have a finished grade of approximately 1445 feet above MSL, and will include open interception ditches along the northern and eastern perimeters to capture storm runoff. During construction, approximately 35 acres will be under permanent development, while the balance of up to 10.8 acres will be used for construction laydown and parking. Imported fill is estimated at 8,000 cubic yards.

Monserate Sandy Loam (MmB) is the primary soil type covering the IEEC site, as well as for the proposed recycled water, domestic water and sewer line routes. Other less dominant, but similar soil types are found on the IEEC site, while numerous other soil types lie along the routes of the linear facilities for non-reclaimable wastewater and natural gas. Rather than listing the other numerous soil types separately, only the primary soil types are being listed in Soil and Water Table 1. Additional soil characteristic data can be found in Table 5.6-1 of the AFC. Soils on the IEEC site were developed from sedimentary alluvium, shed off the adjacent highlands consisting of mixed igneous rock.

SOIL AND WATER Table 1
Soil Types Potentially Affected & Characteristics

Primary Soil Name	Slope Class %	Erosion Hazard	Permeability	Drainage	Shrink-Swell Potential
Monserate Sandy Loam (MmB)	0 – 5%	Slight	Moderate to Slow	Well-Drained	Low
Monserate Sandy Loam (MnD2)	5 – 15%	High	Moderately Rapid to Slow	Well-Drained	Low
Exeter Very Fine Sandy Loam (EwB)	0 – 5%	Slight to Moderate	Moderate to Slow	Well-Drained	Low
Greenfield Sandy Loam (GyC2)	2 – 8%	Slight to Moderate	Moderate	Well-Drained	Low
Madera Fine Sandy Loam (MaB2)	2 – 5%	Slight to Moderate	Slow to Very Slow	Moderately Well-Drained	Low

(Calpine 2001a, AFC Sections 1.8.6, 3.5.8, 5.6 and Appendix G – Section 3)

SOIL AND GROUNDWATER CONTAMINATION

A Phase I Environmental Site Assessment (CALPINE 2001a, Appendix H - Phase I ESA) was performed for the proposed IEEC site, and noted the following:

- The site is currently used for agriculture. High-powered electric lines, telephone lines, and a drainage ditch run parallel to the southern property boundary. Concrete debris from an old irrigation system and some old tires are in the center of the east side of the site.
- The site has been vacant or used for agriculture since prior to 1953.
- Evidence of past or present hazardous substance use, storage or disposal was not observed on the property during the site reconnaissance.
- An asphalt-gravel plant is north of the IEEC site. Piles of asphalt and gravel and old conveyors and other equipment used at the gravel plant are east of the site. Mathews Road and the BNSF Railroad are northeast of the site. Residential and vacant properties are south of the site, across McLaughlin Road. Construction equipment is stored on a portion of the property west of the site, across Antelope Road. The remainder of the western adjoining property is vacant.
- Based on an environmental database search, the IEEC site and surrounding properties were not identified as locations of known materially hazardous conditions.

In addition to information provided in the Phase I ESA for the proposed IEEC, soils and groundwater contamination are known to exist on March Air Reserve Base (MARB) as a result of historic base operations. MARB and select off-site areas are designated as an EPA Superfund Site, and are located in the Perris North sub-basin, approximately 15 miles north of the proposed IEEC. Groundwater contamination occurs both on-base and off-base to the east and southeast of MARB. The principal organic chemicals of concern are trichloroethylene (TCE) and tetrachloroethylene (PCE). In addition to the MARB site, groundwater contamination has been detected in monitoring wells for the Double Butte Landfill, located approximately 3 miles southeast of the proposed IEEC (CALPINE 2001a, Section 5.4).

GROUNDWATER

The proposed IEEC site is located in the West San Jacinto Groundwater Basin (WSJGB). Groundwater in this vicinity has been an important source of water supply since the late 1800s. Water is produced currently for municipal, agricultural, industrial and domestic purposes. Groundwater use for agriculture is slowly yielding to municipal use as overlying land uses change from rural to urban. Groundwater resources within the WSJGB are managed by EMWD and other cooperating agencies and producers in accordance with an AB 3030 Monitoring Program, which divides approximately 104,500 acres of the WSJGB into nine sub-basins. IEEC overlies the Perris South III sub-basin, and is bordered by the Perris South II sub-basin to the north, the Winchester sub-basin to the southeast and Menifee I sub-basin to the southwest. The Lakeview sub-basin is located northeast of the Perris South II sub-basin.

Regionally, groundwater flows generally toward the south-central part of the Perris South II sub-basin, then northeast into the Lakeview sub-basin. The regional flow

pattern can be disrupted locally by extensive pumping. Regional flow gradients range from 10 to 100 feet per mile. Current depths to water range from less than 20 feet below ground surface (bgs) to nearly 300 feet bgs, with depths to groundwater in the vicinity of the IEEC generally ranging from 50 to 100 feet bgs. Historic groundwater levels generally show mixed trends over time in response to periods of drought, above normal rainfall, and changes in the locations and magnitude of pumping. Throughout most of the WSJGB Basin, groundwater levels declined during the 1950's into the early 1970's in response to periods of drought and agricultural pumping, but have since recovered to levels that in some areas are among the highest in recorded history. However, to the opposite extreme, groundwater levels in the Lakeview sub-basin located northeast of the IEEC site have declined steadily on the order of 250 feet since about 1915.

As part of the AB3030 Program, EMWD's goal is to directly measure or estimate all groundwater produced from the basin, and in support of this endeavor, EMWD monitors production from 91 wells. In 2000, groundwater production from the basin was about 23,000 acre-feet, in comparison to the estimate for safe yield from the WSJGB of 48,000 acre-feet/year. Significant reserves of brackish to saline groundwater, characterized as having concentrations of Total Dissolved Solids (TDS) in excess of 1,000 mg/l and 10,000 mg/l respectively, occur in the southern part of the basin. The salinity of these groundwater reserves precludes direct use for potable or agricultural purposes. In order to recover these resources, EMWD has employed a phased program for developing groundwater desalinization, from which the product is of excellent quality for potable purposes. Planned extractions will occur in the Perris South II and Menifee I sub-basins located directly north and south of the proposed IEEC, and possibly from the Lakeview sub-basin located to the northwest of the Perris South II sub-basin. Currently, capacity for recovery and treatment is 3 mgd, with immediate plans to implement an additional 4.5 mgd. After monitoring each progressive phase to assure that groundwater is not being depleted, EMWD may consider implementing additional brackish groundwater extraction and treatment for potable supply. EMWD believes that it is reasonable to expect that basin production could increase by 8,000 acre-feet/year through its groundwater desalinization program.

Although the groundwater desalinization program provides additional water supply, its primary purpose is to manage salinity in the basin and reverse upward trends. In addition to this program, increasing the utilization of tertiary-treated recycled water produced from its five RWRFs is also key to EMWD's management of groundwater salinity, as it reduces recharge of recycled water that would otherwise contribute to groundwater salinity (CALPINE 2001a, Section 5.4).

SURFACE HYDROLOGY

The proposed IEEC site is located in the Menifee Valley portion of the San Jacinto River watershed. The San Jacinto River watershed encompasses an area of 753 square miles. Climate in the project area is semi-arid. Precipitation occurs principally as rainfall during the winter months from November through April, and averages about 12 inches/year. No perennial surface water sources exist on the project site or within one mile of the IEEC site. San Jacinto River, an ephemeral drainage, traverses the valley in a northeast to southwest direction and is located about 3 miles northwest of the IEEC

site. Salt Creek, another ephemeral drainage, traverses the valley in generally a westward direction and is located about 4 miles south of the IEEC site. The Ethanac Wash is the primary drainage feature near the site of the proposed IEEC, and drains along the IEEC southern property boundary at McLaughlin Road and eventually into the San Jacinto River (CALPINE 2001a, Section 5.4).

The Ethanac Wash defines the 100-year flood boundary in the vicinity of the IEEC. Based on the most recent Flood Insurance Rate Map (FIRM) – Panel 2085 of 3600, it initially appeared that the limits of the 100-year flood plain overlap the IEEC site along the southern boundary (IEEC 2002c, Figure 51-2). However, the Applicant has submitted more recent hydrologic and topographic information applied to water surface profile (HEC-2) modeling indicating that the IEEC site is entirely outside of the 100-year flood zone (FWEC 2002c, Data Response #51 – Attachment 1).

The proposed project linear facilities will cross a total of five ephemeral drainages, which are contiguous and considered jurisdictional waters of the United States Army Corps of Engineers (USACOE) under Section 404 of the Clean Water Act. These ephemeral drainages empty into Ethanac Wash, and then into the San Jacinto River. The jurisdictional bed and bank features range in width between two to five feet at the ordinary high water mark, and are located south of the IEEC site draining in generally an east to west direction. The potable water, recycled water, sanitary sewer and non-reclaimable wastewater pipelines will cross under the drainage feature immediately southwest of the IEEC site within the Antelope Road right-of-way. The natural gas pipeline will cross under the drainage feature slightly to the east of the water and wastewater pipelines, and the 500 kV transmission line will have new tower footings constructed within the drainage feature to a limited extent.

PROJECT WATER SUPPLY

IEEC Plant Water Uses

Recycled water supply from EMWD as provided via a 24-inch service is projected to average 2,468 gpm (3.56 mgd) and peak at 5,136 gpm (7.40 mgd). These average and maximum daily water demands indicate a range of expected average daily flow rates corresponding to average daily temperatures ranging from 61°F to 97°F, and operation excluding and then including duct firing, for the average and maximum conditions respectively. On an annual basis, IEEC's average annual recycled water demands for cooling and process purposes are projected to be 4,150 acre-feet/year based on 8 hours/day duct firing, and peak annual demands are projected to be 4,958 acre-feet/year based on 16 hours/day duct firing. Recycled water will be used for producing steam in the Heat Recovery Steam Generators (HRSG's) and for condensing the steam in the cooling tower. Potable water supply from EMWD as provided via an 8-inch diameter service is projected to average 2 gpm, and will be used for domestic, fire suppression and plant service water purposes. Recycled water supplied to IEEC will be received in a Recycled Water Storage Tank with a capacity of 2.5 million gallons. The average and maximum daily water demands projected for water supply to the IEEC are summarized as follows:

SOIL & WATER TABLE 2
Annual and Daily Project Water Demands

Water Use	Average Instantaneous Use	Maximum Instantaneous Use
Microfiltration Reject to Sanitary Sewer	4 gpm	18 gpm
Reverse Osmosis Reject Water Recycled to Cooling Tower	16 gpm	81 gpm
Demineralized Water to CTG Foggers to Stack	15 gpm	66 gpm
Demineralized Water to CTG for Wash Water Recycled to Cooling Tower	2 gpm	2 gpm
Demineralized Water to Steam Cycle Makeup Recycled to Cooling Tower	31 gpm	175 gpm
HRSG Blowdown System Quench Water Recycled to Cooling Tower	23 gpm	43 gpm
Water to Cooling Tower Makeup	2,377 gpm	4,751 gpm
Total Plant Water Usage Requirements	**2,468 gpm**	**5,136 gpm**

(1) Average annual water consumption requirements are based on operation at 61°F with two CTGs operating at 100% load, no HRSG duct firing, CTG inlet air fogging, and no CTG power augmentation steam injection;
(2) Peak annual water consumption requirements are based on operation at 97°F with two CTGs operating at 100% load, maximum HRSG duct firing, CTG inlet air fogging, and CTG power augmentation steam injection;
(3) Average and peak water demands are conservatively based on a minimum of 5 cycles of concentration of the cooling water, which is expected to operate within a range of 5 – 10 cycles of concentration.

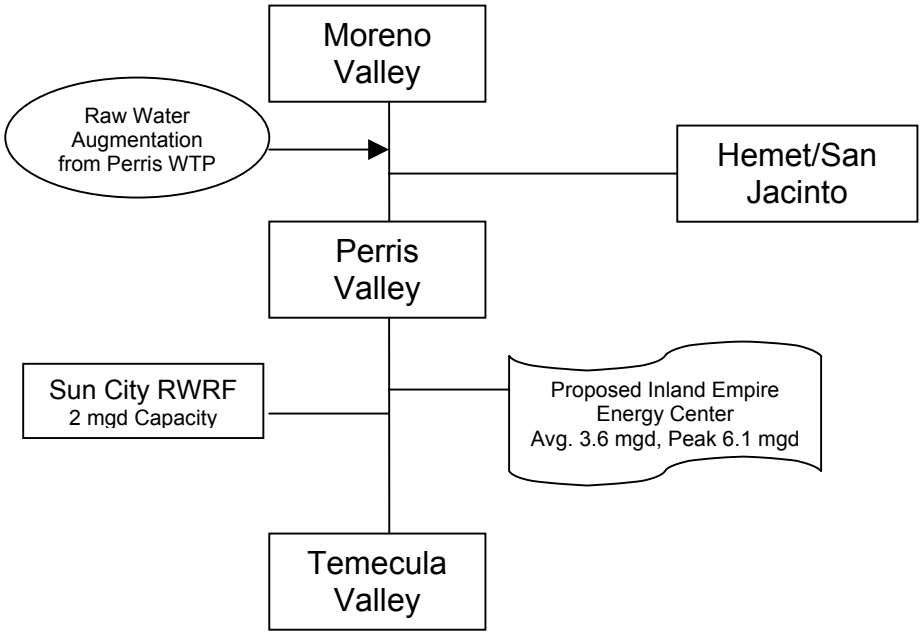
(Calpine 2001a, Section 3.4.9, Figures 3.4-6 and 3.4-7)

EMWD's Recycled Water Supply

EMWD provides wholesale and retail water service and wastewater services to a 555 square mile service area in Riverside County. It is responsible for water supply, water treatment, wastewater collection, wastewater treatment, water recycling and groundwater management within its boundaries. EMWD is a member public agency of the Metropolitan Water District of Southern California (MWD). EMWD's recycled water system is a system interconnecting 5 Regional Water Reclamation Facilities (RWRFs) with approximately 135 miles of distribution pipelines. Flow equalization, local storage and regional storage facilities are operated together to manage wastewater supplies and maximize beneficial reuse within EMWD.

The physical arrangement of EMWD's integrated recycled water system for serving recycled water supply to IEEC is as shown in Soil & Water Figure 1.

Soil and Water Figure 1
EMWD's Recycled Water System



Recycled water supply to the proposed IEEC will primarily originate from the Moreno Valley and Perris Valley RWRFs due to the expected supply and demand relationships and hydraulic gradient within EMWD's recycled water system. Presently, reclaimed water approaches full utilization during summer months, while significant excess supply exists in winter months, largely because agricultural use is seasonal. Agricultural use is responsible for about 55 percent of the overall annual demand for recycled water in EMWD's service area, in addition to 29 percent being applied to disposal/incidental recharge, 10 percent for municipal purposes and 6 percent for environmental purposes (IEEC 2002c, Data Response #83). The projected availability of recycled water supply to IEEC as proposed by EMWD is as shown in Soil & Water Table 3.

Soil & Water Table 3
Projected Summary of IEEC Recycled Water Use & Augmentation of Fresh Water to EMWD's Recycled Water System (acre-feet/year)

Year	Recycled Water Available From EMWD	Fresh Water Augmentation Needed To Meet Avg. 4,150 afy Demands	Fresh Water Augmentation Needed To Meet Peak 4,958 afy Demands
2005	4,086	64	872
2006	4,276	0	682
2007	4,465	0	493
2008	4,628	0	330
2009	4,769	0	189
2010	4,888	0	70
2011	4,958	0	0

2015	4,958	0	0
2020	4,958	0	0
2025	4,958	0	0
2030	4,958	0	0

(IEEC 2002c, Data Response # 81)

EMWD believes the projection of available recycled water is conservative because it does not account for additional recycled water that may be available as a result of less agricultural use when agricultural lands are taken out of production for urban development (IEEC 2002g). In addition, before augmenting its recycled water system with fresh water, recycled water would first be withdrawn from storage if available, of which EMWD has 10 storage ponds encompassing about 500 acres and a total capacity of over 6,000 acre-feet (IEEC 2002c, Data Request #83).

EMWD's Recycled and Fresh Water Quality

The quality of the recycled and fresh water supplies proposed from EMWD's recycled water system is characterized in Soil & Water Resources Table 4.

SOIL & WATER RESOURCES TABLE 4
EMWD's Recycled Water Quality

Constituents	Recycled Water Perris Valley RWRF mg/l	Recycled Water Moreno Valley RWRF mg/l	Raw Water Colorado River Aqueduct mg/l	IEEC Design Parameter mg/l as Constituent
Cations (mg/l)				
Calcium	40.2	23.2	73.3	73.3
Magnesium	12.3	11.3	26.9	26.9
Sodium	111.5	93.7	87.0	111.5
Potassium	14.2	12.7	4.3	14.2
Ammonium	0.2	0.2	-	0.2
Total Cations	-	-	-	
Anions (mg/l)				
Carbonate	0.3	0.3	1.0	1.0
Bicarbonate	131.4	103.0	158.5	158.5
Hydroxyl	0.3	0.3	No Data	0.3
Carbon Dioxide	No Data	No Data	1.2	1.2
Sulfate	76.2	48.8	237.8	237.8
Chloride	156.0	131.0	76.5	156.0
Nitrate	0.4	2.9	0.9	2.9
Phosphate	No Data	No Data	No Data	No Data
Fluoride	0.2	0.1	0.3	0.3
Total Anions				
Hardness (mg/l)	146.5	104.7	294.0	294.0
Alkalinity				
Total Alkalinity	108.5	84.8	131.3	131.3
Bicarbonate Alkalinity	107.8	84.5	130.0	130.0
Metals (mg/l)				
Aluminum	No Data	No Data	0.23	-
Total Chromium	<.005	<.005	No Data	-
Copper	<.007	<.007	No Data	-
Manganese	0.10	0.10	No Data	-
Zinc	0.08	0.08	No Data	-

Other				
PH	7.3	7.2	8.3	7.6
Silica	23.4	18.7	9.0	23.4
Turbidity (NTU)	No Data	No Data	0.8	0.8
Total Dissolved Solids (TDS)	509.2	426.7	596.0	596.0
Total Suspended Solids (TSS)	<3	<3	No Data	3.0
Total Organic Carbon	8.4	9.5	3.7	9.5
Sp. Conductivity (umho/cm)	880.8	735.0	948.8	948.8

(Calpine 2001a, Table 3.4-5) (IEEEC 2002c, Data Request #105)

Possible Measures for Reducing the Fresh Water Augmentation of Recycled Water

Staff has reviewed the merits of several measures for reducing overall cooling and process water demands, which have the potential to reduce the projected need to augment the recycled water system with fresh water. These are briefly identified here and analyzed in the Analysis of Project-Related Impacts below:

Brackish Groundwater

Significant reserves of brackish to saline groundwater, characterized as having concentrations of Total Dissolved Solids (TDS) in excess of 1,000 mg/l and 10,000 mg/l respectively, occur in the southern part of the WSJGB. The salinity of these groundwater reserves precludes direct use for potable or agricultural purposes. In order to recover these resources, EMWD has employed a phased program for developing groundwater desalinization.

In-Plant Water Conservation

1. Increasing the Cycles of Concentration of Cooling Water – The Applicant currently assumes the IEEC will operate within a range of 5 to 10 cycles of concentration and operation in the higher range could further reduce water use.

2. Reclaiming Storm Water Runoff – A 7.6 acre-foot detention basin is proposed on the IEEC site to detain and regulate storm water runoff to avoid discharges in excess of pre-project conditions, and water detained could potentially be recycled for use as cooling tower makeup.

3. Concentration of Waste Streams - A range of processes are available to concentrate cooling tower blow-down and other waste streams and recover high quality water for reuse. The most widely used in the power plant industry are membrane systems, like microfiltration and reverse osmosis, which are currently proposed to be employed for refining the IEEC steam make-up water. Waste Stream Concentration would reduce the discharge volume into EMWD's Non-Reclaimable Wastewater Line.

4. Zero-Liquid Discharge (ZLD) System - Although a ZLD System is not currently proposed, it could reduce the IEEC cooling water demands by treating and recycling

wastewater for cooling tower makeup that is currently proposed for discharge into EMWD's Non-Reclaimable Wastewater Line.

Process and Sanitary Wastewater

The Applicant proposes to discharge sanitary wastes and backwash from its microfiltration process into the sanitary sewer. Cooling tower blowdown would be discharged into the Non-Reclaimable Wastewater Pipeline. Other wastewater streams would be recycled for use as cooling tower makeup. These include the reject stream from reverse osmosis, HRSG blowdown, and recovery from plant service water drains.

IEEC will produce non-reclaimable wastewater at an average rate of approximately 0.86 mgd, and up to 1.2 mgd peak flow. A new 4.7 mile long pipeline for conveying the IEEC non-reclaimable wastewater discharge will be constructed from IEEC to EMWD's Reach 4 Pipeline that conveys wastewater to the Temescal Valley Regional Interceptor and Santa Ana Regional Interceptor (TVRI and SARI) Systems pipeline for eventual treatment at Orange County Sanitation District's (OCSD's) treatment plant and discharge into the Pacific Ocean. EMWD's Reach 4 Pipeline has a current capacity of 10 mgd, and is only utilized to about 1 mgd currently in conjunction with EMWD's groundwater desalinization program. EMWD also has current capacity entitlement for up to 4.378 mgd discharge into the TVRI and SARI pipelines.

The OCSD has established maximum allowable concentration limits for non-reclaimable wastewater discharged to their system, and EMWD has adopted similar limits for its customers to assure compliance with OCSD's requirements. A comparison of EMWD's maximum allowable non-reclaimable wastewater discharge limits with IEEC's expected discharge for various constituents is as shown in Soil and Water Table 5.

Soil and Water Table 5
Comparison of EMWD's Maximum Allowable Concentrations for Non-Reclaimable Wastewater with IEEC's Wastewater Quality

Constituent	EMWD's Maximum Allowable Concentration (mg/l)	IEEC Effluent @ 5 Cycles of Concentration (mg/l)	IEEC Effluent @ 7 Cycles of Concentration (mg/l)
Arsenic	2.0	0.18	0.25
Cadmium	1.0	0.04	0.06
Chromium	2.0	0.07	0.10
Copper	3.0	0.09	0.13
Cyanide (Total)	5.0	0.001	0.002
Cyanide (Amenable)	1.0	0.001	0.002
Lead	2.0	0.19	0.27
Mercury	0.03	0.007	0.01
Nickel	10.0	0.26	0.36
Oil & Grease	100.0	N/A	N/A
Silver	5.0	0.08	0.11
PCB's	0.01	N/A	N/A
Total Toxic Organics	0.58		

Zinc	10.0	1.05	1.47

N/A = Not Applicable
(CALPINE 2001a, Figure 3.4-6, Table 5.4-6 and Section 5.4)

Storm Water

The existing grade for the IEEC site ranges from 1448 to 1439 feet above mean sea level (MSL), and gently drains to the west and southwest. The power plant will have a finished grade of approximately 1445 feet above MSL, and will include two open interception ditches along the northern and eastern perimeters to capture run-on storm water flows. The interception ditch along the northern boundary will be a landscaped ditch sized for a capacity of 4.6 cfs for the 100-year, 1-hour event and draining to the west, through a culvert under Antelope Road, and continuing via an existing shallow ditch on the west side of Antelope Road in a southward direction. The interception ditch along the easterly boundary will be a landscaped ditch sized for a capacity of 407 cfs for the 100-year, 1-hour event and draining to the south and discharging along the southern boundary of the IEEC property as sheet flow. During construction, approximately 35 acres will be under permanent development, while the balance of up to 10.8 acres will be used for construction laydown and parking.

The Riverside County Flood Control and Water Conservation District requires that all structures be protected from flooding associated with a 100-year storm event. In addition, the District specifies that if a regional storm drain facility is not present (as is the case for IEEC), then the Applicant must mitigate the impacts associated with increased runoff from the development by including a storm water detention basin. The detention basin is to be sized to mitigate the runoff from the 2-year, 5-year and 10-year storm events for durations of 1, 3, 6 and 24 hours. The lower the duration, such as for a 1-hour storm, the higher the precipitation intensity and resulting average flow rate, which provides a design basis for sizing the storm water conveyance capacity. The higher the duration, such as for a 24-hour storm, the lower the precipitation intensity and average flow rate, but the greater the overall volume of accumulated storm water. The 24-hour duration provides a design basis for sizing the volume of the detention basin. The proposed 7.6 acre-foot detention basin, will be sized to detain two consecutive 24-hour, 25-year storms, which is also adequate to detain a 24-hour, 100-year storm. The detention basin is proposed to be located near the southwest corner of the site, and would discharge to the southwest into an existing drainage swale, which flows in a westward direction (IEEC 2002c, Data Request #'s 117, 118, 119 and 122).

A comparison of pre- and post-developed storm water volumes and peak flows for the power plant excluding chemical containment areas that will otherwise drain to the cooling tower, is provided in Soil & Water Table 6, including the effect of regulating storm water runoff through the detention basin.

Soil & Water Table 6
Comparison of Pre- and Post-Developed Storm Water Volumes and Peak Flows for the Process Area

	Unit Hydrograph Results				Detention Basin Routing Results		
	Pre-Developed		Post-Developed				
24-Hour Storm Recurrence	Flood Volume acre-feet	Peak Flow cfs	Flood Volume acre-feet	Peak Flow cfs	Basin Volume acre-feet	Routed Peak Flow cfs	Basin Depth feet
2-Year	0.40	0.63	2.40	4.60	0.80	1.1	1.00
5-Year	0.50	1.60	3.60	7.04	1.85	1.1	1.30
10-Year	2.20	6.80	4.80	9.08	3.16	1.1	1.70
25-Year	3.20	9.00	6.00	12.30	4.31	1.1	2.10
100-Year	4.70	12.30	8.00	16.03	6.20	1.1	2.60

Basin capacity of 7.6 acre-feet with 3.0 feet of depth, and a 6-inch diameter outlet pipe;
(IEEC 2002c, Data Request #118)

The southern boundary of the IEEC runs parallel to a group of small bed and bank drainage features, which are considered waters of the United States under the jurisdiction of the United States Army Corp of Engineers (USACOE). The proposed project linear facilities will cross a total of five ephemeral drainages, which are contiguous and empty into Ethanac Wash, and then into the San Jacinto River. These jurisdictional bed and bank features range in width between two to five feet at the ordinary high water mark, and are located immediately south of the IEEC site draining in generally an east to west direction. The potable water, recycled water, sanitary sewer and non-reclaimable wastewater pipelines will cross under the drainage feature immediately southwest of the IEEC site within the Antelope Road right-of-way. The natural gas pipeline will cross under the drainage feature slightly to the east of the water and wastewater pipelines, and the 115 kV and 500 kV transmission lines will have new tower footings constructed within the drainage feature to a limited extent (IEEC 2002g, Data Response #164).

ANALYSIS OF PROJECT RELATED IMPACTS

DIRECT AND INDIRECT IMPACTS

Soil

Accelerated wind and water-induced erosion may result from earthmoving activities associated with construction of the proposed project and associated linear features. Activities that expose and disturb the soil leave soil particles vulnerable to detachment by wind and water. Prolonged periods of precipitation, or high intensity and short duration runoff events coupled with earth disturbance activities can result in on-site erosion eventually increasing the sediment load within nearby receiving waters.

Based on the soil characteristics of the IEEC site and associated linear facilities, erosion potential from wind and water is generally slight to moderate. The project owner will be required to implement soil erosion control measures during construction and operation.

The erosion potential is high in the southeast corner of the IEEC site adjacent to McLaughlin Road, where there are 1 to 2 acres of Monserate Sandy Loam. This area corresponds with the Ethanac Wash drainage feature, a tributary to the San Jacinto River, and appears to define the limit of the 100-year floodplain. The proposed power plant and related facilities located on the IEEC site would be arranged north of this feature, and thus soil disturbance would be limited to construction laydown and parking, and would not be expected to cause a significant adverse impact.

The project site size is 45.8 acres, of which 35 acres would be developed permanently for the IEEC facility. The highest potential for erosion will be during construction when the surface will be void of vegetation. Best Management Practices (BMPs) for erosion control are proposed to be implemented and have been conceptually described by the Applicant. More detailed plans will be developed as part of the Erosion and Sedimentation Control Plan as required under Condition of Certification **Soil & Water 1**. These plans will be site specific and address the entire project including ancillary facilities and linear features. The Erosion and Sedimentation Control Plan should also address placement of geotextile fabric in areas of the Construction and Laydown Area where crushed rock will be temporarily placed, in order to accommodate reuse of the soils for agriculture. Staff's recommendation under this condition is for plans to be provided by the applicant, reviewed for compliance with local land use LORS by Riverside County, and approved by the Energy Commission Compliance Project Manager, prior to initiating any earthmoving activities.

Soil and Groundwater Contamination

Based on the findings resulting from the Phase I ESA, it does not appear that there is any known contamination at the IEEC site, nor any significant potential for such conditions to exist considering its historical use for agriculture.

The soil and groundwater contamination known to exist on March Air Reserve Base (MARB) resulting from historic use of trichloroethylene (TCE) and tetrachloroethylene (PCE), is currently undergoing a remediation program. The base operates an Enhanced Groundwater Extraction and Treatment System along the eastern boundary to capture and treat contaminated groundwater. The IEEC is not expected to affect or be affected by the soil and groundwater contamination at MARB.

In addition to the MARB site, groundwater contamination has been detected in monitoring wells for the Double Butte Landfill, located southeast of the proposed IEEC. Preliminary testing suggests some organic chemicals have moved south from the landfill into shallow aquifer zones of the Winchester sub-basin, which is located southeast of the Perris South III sub-basin where the proposed IEEC would reside. The IEEC is not expected to affect or be affected by the soil and groundwater contamination at Double Butte Landfill.

There do not appear to be any potential adverse impacts associated with soil and groundwater contamination that could affect or could be exacerbated by the proposed IEEC project.

Groundwater

The proposed IEEC would not use groundwater as its water supply. However, water balance and salinity concentrations in the groundwater basin are a related consideration to the proposed recycled water supply to IEEC because there would be a slight reduction in the quantity of EMWD's recycled water applied to groundwater recharge. Supply of tertiary-treated recycled water produced in excess of customer demands is stored in five locations consisting of ten storage/percolation ponds over about 500 acres of land, and of a cumulative capacity of over 6,000 acre-feet. As noted in Soil & Water Table 4, TDS concentrations of the effluent from the Perris Valley and Moreno Valley RWRFs have an average concentration of about 509 and 427 mg/l respectively. West San Jacinto Groundwater Basin (WSJGB) recharge from all sources is estimated to average on the order of 48,000 - 50,000 acre-feet/year, with the contribution from EMWD's recycled water storage/percolation ponds estimated to average 8,300 acre-feet/year (CALPINE 2001a, Section 5.4). The proposed supply to IEEC of 4,150 acre-feet/year would directly reduce the groundwater recharge attributable from recycled water from about 8,300 to 4,150 acre-feet/year. Considering that the existing average recovery from groundwater is about 23,000 acre-feet/year, and the average annual recharge is about 48,000 acre-feet/year, a reduction in average annual recharge by an amount of 4,150 acre-feet/year (from about 48,000 to 44,000 acre-feet/year) due to IEEC's utilization, would not cause a depletion or a net adverse impact on the overall WSJGB water balance. Projected recovery of groundwater by 2030 is about 33,780 acre-feet/year, which in comparing to average annual recharge of 44,000 acre-feet /year (accounting for IEEC's demand), would still not cause a depletion or a net adverse impact on the overall WSJGB water balance.

The proposed use of recycled water would have a net positive effect in reducing groundwater salinity consistent with supporting EMWD's management objectives. Increasing the utilization of tertiary-treated recycled water produced from EMWD's five RWRFs is a key component to EMWD's management of groundwater salinity, as it avoids recharge of recycled water that would contribute to increasing salinity concentrations in non-brackish groundwater. The proposed use of recycled water by IEEC also will have a net positive effect on groundwater nitrate levels. The IEEC will use reclaimed water year around instead of seasonally as in agricultural uses, thus providing a demand more consistent with patterns of supply.

EMWD's groundwater desalinization program contributes to the management of groundwater salinity. Although the groundwater desalinization program provides additional water supply, its primary purpose is to manage salinity in the basin and reverse upward trends. EMWD's desalination projects are part of a long-range program to extract brackish groundwater to upgrade basin groundwater quality. Their primary goal is to reduce the salinity of a confined brackish lower groundwater aquifer thought to be caused by years of agricultural irrigation, with development of a new potable water supply being a secondary goal. The implementation of additional phases of the Brackish Water Recovery Program is subject to maintaining aquifer water balance as monitored by EMWD. EMWD has completed their first 3MGD desalination plant, with a second 4.5 MGD facility under design.

IEEC's proposed utilization of recycled water would not cause a depletion or a net adverse impact on the overall WSJGB water balance. The proposed use of recycled water by IEEC would have a net positive effect on improving groundwater salinity concentrations in localized sub-basins of the WSJGB.

Surface Hydrology

The project site is located near the 100-year floodplain on the southern boundary of the IEEC property near McLaughlin Road, and to a lesser extent on the western boundary west of Antelope Road. The Ethanac Wash defines the 100-year flood boundary in the vicinity of the IEEC. Based on the most recent Flood Insurance Rate Map (FIRM) – Panel 2085 of 3600, it appears that the limits of the 100-year flood plain overlap the IEEC site along the southern boundary (IEEC 2002c, Figure 51-2). However, the Applicant has submitted more recent hydrologic and topographic information applied to water surface profile (HEC-2) modeling, indicating that the IEEC site is entirely outside of the 100-year flood zone (FWEC 2002c, Data Response #51 – Attachment 1). No permanent facilities are proposed to be located within the previously considered 100-year flood boundary, and the Applicant is considering using the southern portion of the IEEC site for construction staging and parking.

In a letter dated February 10, 2001, FEMA responded to a Request for a Conditional Letter of Map Revision (CLOMR) by Albert A. Webb Associates representing Riverside County, to evaluate updated topographic and hydrologic data along Ethanac Wash in the vicinity of the proposed IEEC Project. In its response, FEMA indicated that it had received all information necessary to consider the request for a CLOMR. FEMA's response also indicated that the proposed project meets the minimum floodplain management criteria of the National Flood Insurance Program (NFIP) Regulations, and that if the project is constructed as proposed, a revision to the FIRM would be warranted. Based on the above, it does not appear that the proposed IEEC Project will either exacerbate flood conditions, or be exposed to flood conditions itself.

Condition of Certification **Soil and Water 7** requires that following initiation of commercial operation of the IEEC, the project owner shall provide the CPM with evidence in coordination with County of Riverside of its submittal of as-built plans and related information as specified in FEMA's CLOMR letter dated February 20, 2001. This information will allow FEMA to initiate a revision to the FIRM and Flood Insurance Study (FIS) Report. The project owner shall also submit a copy of FEMA's Final Letter of Map Revision (LOMR) in response to its submittal of as-built plans.

The proposed project linear facilities will cross a total of five ephemeral drainages, which are contiguous and considered jurisdictional waters of the United States Army Corps of Engineers (USACOE) under Section 404 of the Clean Water Act. The potable water, recycled water, sanitary sewer and non-reclaimable wastewater pipelines will cross under the drainage feature immediately southwest of the IEEC site within the Antelope Road right-of-way. The natural gas pipeline will cross under the drainage feature slightly to the east of the water and wastewater pipelines, and the 115 and 500 kV transmission lines will have new tower footings constructed within the drainage feature to a limited extent. Temporary disturbance to the drainages is estimated to total 0.145 acres as a result of trenching and backfilling the water and wastewater pipelines and underground portions of electric lines, and construction of the above-ground

portions of the 115 kV and 500 kV transmission lines. Lands within the drainages affected by temporary construction disturbance will be compacted and graded back to original contours, and thus will restore the pre-developed flow capacity of the swales. Permanent disturbance is estimated as a worst case to total 0.014 acres as a result of construction of two of the new 115 kV transmission tower footings and four of the new 500 kV transmission tower footings that may be located within the drainage features. If this is the case, the USACOE will likely permit the Applicant to redirect the drainage channel around the new footings, providing an equivalent flow capacity to the altered sections of the drainage (USACOE 2002a). Therefore, the construction of the new footings will not exacerbate flood conditions.

Project Water Supply

EMWD has committed to provide IEEC recycled water in accordance with availability of unallocated existing supplies, as well as allocation of 100 percent of new supply as it becomes available from its Perris Valley and Moreno Valley RWRFs. On December 20, 2001, the Applicant and EMWD executed a MOU for the Provision of Recycled Water to IEEC, expressing this commitment (EMWD 2002d). In the interim, recycled water is projected to be available for IEEC cooling and process needs beginning in 2005, which is expected to be the first year of project operation, in sufficient quantities to meet 98 percent of average annual demands and 82 percent of peak annual demands. By 2006, recycled water is projected to be available in sufficient quantities to meet 100 percent of average annual demands and 86 percent of peak annual demands. By 2011, recycled water is projected to be available in sufficient quantities to meet 100 percent of both average and peak annual demands.

Staff is recommending Condition of Certification **SOIL & WATER 6** specifying that prior to initiating project construction, the project owner shall submit evidence of having secured a Service Agreement with EMWD. The Service Agreement shall address recycled water for supplying process and cooling water, potable water for domestic and fire protection, process wastewater to be discharged into the non-reclaimable waste line, and sanitary wastewater service. Securing the Service Agreement prior to construction is consistent with the terms of the MOU between EMWD and IEEC.

Supply of recycled water to IEEC benefits EMWD's recycled water program by developing a demand for recycled water particularly in the winter months when EMWD's other customers, particularly agricultural use, is limited. Over the past decade, winter-time supply of recycled water has ranged from 1,800 acre-feet/month to more recently around 2,700 acre-feet/month, while demands have ranged over the same period from about 200 growing to 700 acre-feet/month. The excess in supply of recycled water over demand is primarily conveyed to EMWD's percolation/storage ponds, which contributes adversely to salinity concentrations in the groundwater. IEEC will create a new winter demand ranging from about 260 to 400 acre-feet/month, which has the potential to reduce winter surpluses of recycled water on the order of 12 to 20 percent. IEEC's summer demands for recycled water would range from about 469 to 536 acre-feet/month. Recycled water is projected to supply at least 50 percent of the peak monthly demand during 2005, increasing to full supply by around 2010 or 2011. The increase in recycled water supply is based on an average annual increase of about 3 percent/year. Soil and Water Table 7 summarizes IEEC's peak monthly recycled water demands in comparison to EMWD's projections of available recycled water supply.

Soil & Water Table 7
IEEC's Proposed Peak Monthly Water Demands vs. EMWD's Projected Availability of Recycled Water (Acre-Feet)

Month	Demand AF/month	2005	2006	2007	2008	2009	2010	2011	2015	2020	2030
Jan	398	398	398	398	398	398	398	398	398	398	398
Feb	360	360	360	360	360	360	360	360	360	360	360
Mar	304	304	304	304	304	304	304	304	304	304	304
Apr	294	294	294	294	294	294	294	294	294	294	294
May	351	351	351	351	351	351	351	351	351	351	351
June	340	340	340	340	340	340	340	340	340	340	340
July	536	322	369	417	464	511	536	536	536	536	536
Aug	536	256	304	351	399	446	493	536	536	536	536
Sep	519	256	304	351	399	446	493	519	519	519	519
Oct	536	420	467	515	536	536	536	536	536	536	536
Nov	386	386	386	386	386	386	386	386	386	386	386
Dec	398	398	398	398	398	398	398	398	398	398	398
Total	4,958	4,086	4,276	4,465	4,628	4,769	4,888	4,958	4,958	4,958	4,958

(IEEC 2002c, Data Response #81)
Note: Shaded areas represent months when recycled water supply is projected to be deficient in meeting IEEC demands.

Recycled water supplied to IEEC will be received in a proposed 2.5 million gallon storage tank. The 2.5 million gallons of water will be used during an interruption in water supply. The adequacy of the proposed IEEC water reserve has been analyzed for both cases of complete interruption and hourly fluctuations in supply. For the case if recycled water supply were completely interrupted, the storage tank would be adequate to supply process and cooling water for 8 hours at the maximum demand of 5,136 gpm, and for about 16 hours at the average demand of 2,468 gpm. In comparison, EMWD has experienced RWRF interruptions for up to 24 hours on rare occasions in the past (EMWD 2002c). If an outage were to occur that exceeded the capacity of EMWD's recycled water storage ponds, EMWD would supply additional raw fresh water into its recycled water system in order to maintain service without interruption. If the service interruption were a result of a rupture in the distribution piping, the repair could typically be accomplished within 24-hours. Since IEEC's water supply comes from several of EMWD's RWRFs, recycled water supply could be maintained at some limited flow to IEEC via distribution piping not affected by the isolated rupture unless the rupture were in the pipeline directly supplying IEEC. The worst-case system fluctuations in the supply rate from EMWD's recycled water system, requires a storage volume of about 1.2 million gallons. The storage tank is intended to buffer any hourly fluctuations in inflow, providing a reliable supply to IEEC for the full range of project operations. The 2.5 million gallon tank appears adequate to buffer fluctuations in the deliveries from the recycled water supply system (IEEC 2002c, Data Response #107).

Fresh surface water required to augment the recycled water system will originate from EMWD's entitlements for Colorado River water delivered from the Colorado River Aqueduct. On Feb 11, 2002, Metropolitan Water District (MWD), of which EMWD is a member agency, released a 20-year forecast of how water supplies will be assured for

future development, as required under SB 221 & 610. MWD assures that it would be able to meet EMWD's future water supply needs, including service for IEEC, accounting for reduced entitlements expected for Colorado River diversions (EMWD 2002b). As part of MWD's and EMWD's water supply management initiatives, a wide variety of water conservation projects have been proposed, such as canal linings, groundwater banking, and urban water conservation. Based on MWD's projections of water supply available to EMWD, the augmentation of fresh water into EMWD's recycled water system does not appear to cause a significant adverse impact to EMWD's other water customers. In addition, the point of delivery of raw water into EMWD's recycled water system will be the Perris Water Treatment Plant, a site already approved for development. The booster pump proposed for pressurizing the recycled water system at the Moreno Valley RWRF will be developed within the existing site boundaries. Therefore, neither of these system reinforcement measures is expected to cause significant adverse impacts. Staff's proposed Conditions of Certification **Soil & Water 4 and 5** address water supply and limit the amount of fresh water used to augment recycled water as attributable to IEEC.

Soil & Water Table 8
Recommended Limits of Fresh Water Augmentation to EMWD's Recycled Water System Attributable to IEEC (acre-feet/year)

Year	Recycled Water Available From EMWD	Fresh Water Augmentation Needed To Meet Average 4,150 afy Demands	Fresh Water Augmentation Needed To Meet Peak 4,958 afy Demands	**Recommended Limits of Fresh Water Augmentation Attributable to IEEC**
2005	4,086	64	872	**1,000**
2006	4,276	0	682	**800**
2007	4,465	0	493	**600**
2008	4,628	0	330	**400**
2009	4,769	0	189	**200**
2010	4,888	0	70	**100**
2015	4,958	0	0	**100**
2020	4,958	0	0	**100**
2025	4,958	0	0	**100**
2030	4,958	0	0	**100**

(IEEC 2002c, Data Request # 81)

The basis for staff's proposed schedule is six-fold:

1. EMWD's projection for availability of recycled water as summarized in Soil & Water Table 3, indicates that fresh water augmentation into EMWD's recycled water system will no longer be necessary by the 7th year of project operation, or 2011;

2. The recommended phase-out of fresh water is based on a schedule accounting for IEEC's peak annual demands, and will not affect seasonal variations in the availability and utilization of recycled water;

3. EMWD believes its projections for the availability of fresh water are conservative, as they do not account for decreased use of recycled water when agricultural lands are taken out of production for urban development (IEEC 2002g);

4. Fresh water will continue to serve as a backup supply for EMWD's recycled water system, even after new recycled water supply exceeds the demands of IEEC. The proposed annual fresh water augmentation of 100 afy beginning in the sixth year and thereafter is an annual volume adequate to meet the IEEC's water demands for 4 days on a peak basis (5,136 gpm) and 9 days on an average basis (2,468 gpm);

EMWD has experienced RWRF interruptions for up to 24 hours on rare occasions in the past (EMWD 2002c).

The Applicant has the opportunity to implement economic water conservation measures to further assure that fresh water can be conserved within these limits.

The proposed project water use is not expected to result in a significant adverse impact to surface or groundwater supplies.

EMWD's Recycled and Fresh Water Quality

Water quality expected from EMWD's recycled water system characterized by source, is as shown in Soil and Water Table 4. IEEC will receive a blend of these water supplies from Perris Valley and Moreno Valley RWRF's and possibly Colorado River, therefore the IEEC is being designed to operate with the highest level of each constituent. The quality of the two primary sources, those of Perris Valley and Moreno Valley RWRF's, are very similar. Therefore, significant fluctuations in water quality are not expected, which reduces the potential for upset in IEEC operations.

Water treated for the HRSG system undergoes three primary water treatment processes including microfiltration, reverse osmosis and mixed bed demineralization. Each of these processes will have capacity redundancy equivalent to either two 100 percent or three 50 percent capacity trains. In addition, storage of demineralized water in two 150,000 gallon tanks will be adequate to support 2 days of the average demand for HRSG steam production (IEEC 2000c, Data Request #98).

Possible Measures for Reducing the Fresh Water Augmentation of Recycled Water

Staff has analyzed several measures for reducing overall cooling and process water demands, which have the potential to reduce the projected need to augment the recycled water system with fresh water. These are briefly analyzed here as follows:

Brackish Groundwater

In considering the potential to use brackish groundwater for supply to IEEC, EMWD has already implemented a program for desalinizing brackish groundwater under progressive phases. Current capacity is 3 mgd, with immediate plans to implement an additional 4.5 mgd, and after monitoring to assure groundwater aquifer balance, EMWD may implement additional capacity. The quality of desalinated brackish groundwater is

such that it is superior to most other potable water sources, and as it is developed and treated, EMWD is dedicating its use for potable water. EMWD's comprehensive basin management plan and infrastructure is such that makeup for the deficit in recycled water supply for IEEC during the proposed IEEC early years is best augmented by either Colorado River or State Water Project supply. In addition, EMWD has no infrastructure in place to convey desalinated brackish groundwater to IEEC.

In-Plant Water Conservation

1. Increasing the Cycles of Concentration of Cooling Water – IEEC will utilize a titanium heat exchanger (to reduce fouling) and add chemicals such as scale inhibitors, dispersants and alkalinity control in order to achieve optimal cycles of concentration of the cooling water. Based on the quality of recycled water available for IEEC, the projections for plant water use are conservatively based on 5 cycles to represent a worst case, while the Applicant expects to achieve closer to 6 – 8 cycles of concentration in actual operation. Staff feels that since Colorado River Aqueduct water will not directly influence the quality of reclaimed water received by IEEC, that 8 cycles of concentration is a more consistent minimum and that up to 10 cycles is practical. As an example of water savings, estimated cooling water demands decrease by about 9 percent, from about 4,919 gpm to 4,497 gpm, when increasing the cycles of concentration from 5 to 8 cycles. This would equate to an average annual water savings of about 264 acre-feet/year of combined fresh and recycled water. Considering about 40 percent of the annual demand occurs during July through October when fresh water will likely be augmenting EMWD's recycled water system (in reference to Soil & Water Table 7), the potential for fresh water savings is on the order of about 100 acre-feet/year. The Applicant projects that cooling water for the IEEC as proposed could be concentrated more than 10 cycles, without exceeding the waste discharge limits of the cooling tower blowdown for discharge into the Non-Reclaimable Wastewater Line. The controlling constituent limiting the cooling water to about 10 cycles of concentration is silica from the Perris Valley RWRF. The IEEC project appears very capable of operating at a minimum of 8 cycles of concentration in utilization of cooling water.

2. Reclaiming Storm Water Runoff – The proposed IEEC site should produce about 25 acre-feet/year in storm water runoff. The Applicant does not propose to recycle storm water. Recycling of a full detention basin of storm water would satisfy about 24 hours of winter make-up water demand and 16 hours at the annual average make-up water demand. While recycling of storm water for cooling water makeup would reduce demand of EMWD's water supply, it would also effectively reduce utilization of EMWD's reclaimed water during winter when agricultural use is minimal, and recycled water supply is plentiful. Further, EMWD is seeking other customers like IEEC to expand recycled water use during winter in order to reduce recharge of groundwater with recycled water which results in intensifying salinity in groundwater. Reclaiming storm water runoff would not achieve reductions in the use of fresh water augmentations to EMWD's recycled water system.

3. Concentration of Waste Streams – Implementation of process wastewater treatment though use of microfiltration and reverse osmosis, could be used to concentrate the wastewater streams up to 75% prior to discharge to the non-reclaimable wastewater

line. This would result in conserving about 0.5 mgd (550 acre-feet/year) of combined fresh and recycled water on an annual basis. Considering about 40 percent of the annual demand occurs during July through October when fresh water will likely be augmenting EMWD's recycled water system (in reference to Soil & Water Table 7), the potential for fresh water savings is on the order of about 220 acre-feet/year. The potential water savings is appreciable considering the limited investment to implement a process wastewater treatment system versus the savings resulting from non-reclaimable wastewater sewer capacity and user fees, reduction in makeup recycled water cost, and reduction in Colorado River water augmentation. Assuming costs are comparable to other power plants, a system for Concentration of Waste Streams could cost on the order of $2 - $4.5 million for capital investment and $200,000 - $400,000 per year for operating costs including chemicals and energy.

4. Zero-Liquid Discharge (ZLD) System - Although a ZLD System is not currently proposed, it could reduce the IEEC cooling water demands by treating and recycling wastewater for cooling tower makeup that is currently proposed for discharge into EMWD's Non-Reclaimable Wastewater Line. Staff has estimated the potential for water conservation based on the average day discharge of process wastewater of about 0.7 mgd, which equates to a wastewater volume of approximately 780 acre-feet/year (CALPINE 2001a, Figure 3.4-6). Therefore, assuming some minimal water losses in a ZLD process, implementation of a ZLD System could potentially reduce the average annual cooling and process water demand of 4,150 acre-feet/year by about 15 to 18 percent, or up to 750 acre-feet/year. Considering about 40 percent of the annual demand is concentrated during July through October when fresh water will likely be augmenting (for the first several years) EMWD's recycled water system (in reference to Soils & Water Table 7), the potential for fresh water savings is on the order of about 300 acre-feet/year. Although the potential water savings are appreciable, the capital and operating costs are also appreciable. Using a comparable to other power plants, a ZLD System could cost on the order of $10 - $20 million for capital investment and $1 - $2 million/year for operating costs including chemicals, energy and sludge disposal.

In summary, staff believes that implementation of several of the in-plant water conservation measures are economically attractive based on approximately $9 million in savings that could be realized in reducing the capacity needed for the non-reclaimable wastewater line. The Applicant's estimated cost for the non-reclaimable wastewater pipeline is $2.38 million for the pipeline and $10.34 million for the capacity charge that would be imposed by EMWD, for a total of over $13 million. Staff believes that the total cost associated with the non-reclaimable wastewater pipeline could be reduced to about $4 million by implementing the following recommended water conservation measures: 1) Increasing the cycles of concentration of cooling water from 5 to 8 cycles, which would achieve water savings of approximately 264 acre-feet/year at no additional cost to the project; and 2) Concentrating the waste streams, which would achieve water savings of an additional 550 acre-feet/year, at a cost of about $2 - $4.5 million for capital. This cost would be more than offset by the $9 million savings by reducing the capacity required in the non-reclaimable wastewater line, and would result in a net savings to the project on the order of $4.5 – $7 million. If these conservation measures were implemented, staff estimates that total recycled and fresh water use could be conserved on the order of about 800 acre-feet/year, reducing the average

annual water use from 4,150 to 3,350 acre-feet/year, and the peak annual water use from 4,958 to 4,158 acre-feet/year. Staff also believes that the dependency on fresh water augmentation into EMWD's recycled water system would be greatly reduced during the early years of project operation, estimated to initially yield fresh water conservation on the order of 320 acre-feet/year.

Process and Sanitary Wastewater

Wastewater disposal can lead to soil, surface, and ground water degradation and impairment of beneficial uses. The Applicant proposes to discharge sanitary wastes and backwash from its microfiltration process into the sanitary sewer. Cooling tower blowdown would be discharged into the Non-Reclaimable Wastewater Pipeline. Other wastewater streams would be recycled for use as cooling tower makeup. These include the reject stream from reverse osmosis, HRSG blowdown, and recovery from plant service water drains.

IEEC will produce non-reclaimable wastewater at an average rate of approximately 0.86 mgd, and up to 1.2 mgd peak flow, and will be conveyed via a new 4.7-mile long pipeline from IEEC to EMWD's Reach 4 Pipeline. EMWD's Reach 4 Pipeline has a current capacity of 10 mgd, and is only utilized to about 1 mgd currently in conjunction with EMWD's groundwater desalinization program. EMWD also has current capacity entitlement for up to 4.378 mgd discharge into the TVRI and SARI pipelines, and therefore it is evident that the addition of IEEC's proposed non-reclaimable wastewater volume will not exceed EMWD's current capacity for conveyance and disposal.

The OCSD has established maximum allowable concentration limits for non-reclaimable wastewater discharged to their system, and EMWD has adopted similar limits for its customers to assure compliance with OCSD's requirements. As indicated in the comparison of EMWD's maximum allowable non-reclaimable wastewater discharge limits with IEEC's expected discharge concentrations for various constituents, as shown in Soil and Water Table 5, IEEC's non-reclaimable wastewater discharge quality will be in compliance with EMWD's discharge requirements. Furthermore, EMWD confirmed their acceptance of IEEC's non-reclaimable wastewater in a phone discussion between representatives of EMWD and staff on April 15, 2002 (EMWD 2002b).

Condition of Certification **Soil & Water 6** is recommended to assure that prior to initiating project operation, the project owner has secured a Service Agreement with EMWD. The Service Agreement is to address Recycled Water for supplying process and cooling water, Potable Water for domestic and fire protection, Process Wastewater to be discharged into the Non-Reclaimable Waste Line, and Sanitary Wastewater service. The Service Agreement is also expected to include the Industrial Waste Discharge Permit and Non-Reclaimable Wastewater Discharge Permit as issued by EMWD.

Storm Water

Development of roads, buildings, and other paved or impermeable surfaces as part of the IEEC project will increase the rate and volume of runoff generated on the site. This may increase storm water discharges and the potential for sediment and contaminants to be conveyed by storm water flows off-site. The proposed IEEC will prevent increases in the volume of storm water runoff following development by constructing a 7.6 acre-

foot storm water detention basin. Riverside County Flood Control and Water Conservation District requires that the detention basin be sized to mitigate the runoff from the 2-year, 5-year and 10-year storm events for durations of 1, 3, 6 and 24 hours. The Applicant proposes to not only meet these conditions, but to also size the detention basin to detain two consecutive 24-hour, 25-year storms, as well as a 100-year, 24-hour storm, maintaining discharge below pre-developed rates. The detention basin will also be grass-lined, which encourages removal of traces of oil and grease should they be conveyed into the detention basin from power plant paved areas. Staff is concerned about the adequacy of erosion control measures for the discharge from the detention pond, and is highlighting this as an area of particular concern to be addressed in the final Storm Water Pollution Prevention Plans (SWPPPs) applicable to both construction and industrial activities as recommended in Conditions of Certification **Soil & Water 2 and 3** respectively.

Two open interception ditches are proposed along the northern and eastern perimeters to capture run-on storm water flows. The interception ditch along the northern boundary will be a landscaped ditch sized for a capacity of 4.6 cfs for the 100-year, 1-hour event and draining to the west, through a culvert under Antelope Road, and continuing via an existing shallow ditch on the west side of Antelope Road in a southward direction. The interception ditch along the easterly boundary will be a landscaped ditch sized for a capacity of 407 cfs for the 100-year, 1-hour event and draining to the south and discharging along the southern boundary of the IEEC property as sheet flow. Staff is concerned about the potential for erosion in the southeast corner of the site where the eastern boundary interception ditch will discharge overland up to a rate of 407 cfs during the 100-year storm. This discharge area corresponds with a zone of Monserate Sandy Loam, which characteristically has high erosion potential. Staff is also highlighting this area as an area of particular concern to be addressed in the final Storm Water Pollution Prevention Plans (SWPPPs) applicable to both construction and industrial activities as recommended in Conditions of Certification **Soil & Water 2 and 3** respectively.

During construction, approximately 35 acres will be under permanent development, while the balance of up to 10.8 acres will be used for construction laydown and parking. The southern boundary of the IEEC runs parallel to a group of small bed and bank drainage features, which are considered waters of the United States under the jurisdiction of the United States Army Corp of Engineers (USACOE). The potable water, recycled water, sanitary sewer and non-reclaimable wastewater pipelines will cross under the drainage feature immediately southwest of the IEEC site within the Antelope Road right-of-way. The natural gas pipeline will cross under the drainage feature slightly to the east of the water and wastewater pipelines, and the 115 kV and 500 kV transmission lines will have new tower footings constructed within the drainage feature to a limited extent. Lands within the drainages affected by temporary construction disturbance will be compacted and graded back to original contours, and thus will restore both the pre-developed flow capacity of the swales as well as the pre-developed patterns for storm water runoff. Permanent disturbance is estimated as a worst case to total 0.014 acres as a result of construction of two of the new 115 kV transmission tower footings and four of the new 500 kV transmission tower footings that may be located within the drainage features (IEEC 2002g, Data Request #164). If this is the case, the USACOE will likely permit the Applicant to redirect the drainage channel

around the new footings, providing an equivalent flow capacity to the altered sections of the drainage (USACOE, 2002a). Therefore, the construction of the new footings will not significantly alter storm water runoff conditions.

Measures necessary for establishing erosion control for storm water discharged from the IEEC site at both the interception ditch along the eastern boundary and the detention pond may prompt additional consultation and even jurisdiction for permitting with the USACOE. Although the Applicant has submitted a Request for Nationwide Permit No. 12 to the USACOE addressing the effects to jurisdictional waters resulting from construction of the linear facilities, no information was provided to the USACOE in its application dated May 17, 2002 pertaining to storm water drainage alterations from the IEEC site to the jurisdictional waters. The magnitude and limits of concentrated flow and necessary BMPs for erosion control have not been identified nor provided to the USACOE. As a precaution, staff is recommending that the erosion control plans associated with the storm water discharges from the eastern interception ditch and the detention basin be clearly delineated on drawings in relation to the bed and bank jurisdictional feature running parallel and outside the IEEC southern boundary. These plans shall be reviewed for consideration of jurisdiction by the USACOE, and for adequacy of BMPs by Riverside County, the RWQCB, and CPM prior to initiating construction. Conditions of Certification **Soil & Water 2 and 3** address this concern, and the potential that necessary erosion control BMP's could be considered as a placement of fill within jurisdictional waters, triggering consideration under Section 404 of the Clean Water Act.

The County of Riverside assesses a Flood Mitigation Fee in accordance with Riverside County's Homeland/Romoland Area Drainage Plan (ADP) to assist in providing revenue for establishing adequate community drainage facilities. Condition of Certification **Soil & Water 8** specifies that prior to construction, the Applicant shall pay the appropriate Flood Mitigation Fee to the County of Riverside (Riverside 2002a).

CUMULATIVE IMPACTS

Groundwater

IEEC's proposed utilization of recycled water would not cause a depletion or a net adverse impact on the overall WSJGB water balance. The proposed use of recycled water by IEEC would have a net positive effect on improving groundwater salinity in localized sub-basins of the WSJGB.

Water Supply

The proposed project water supply is not expected to result in any significant adverse impacts to surface water supplies in consideration of quantity and quality of existing resources.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed IEEC power plant (please refer to Socioeconomics Figure 1 in this Staff Assessment). However, as indicated in Socioeconomics Figure 1, there are multiple census blocks with greater than 50 percent

minority persons within the six-mile radius; staff considers these to be pockets or clusters. Staff also reviewed Census 1990 information that shows the low-income population is less than fifty percent within the same radius. Because staff has determined there to be pockets or clusters of minority population within the six-mile radius, staff has conducted a focused environmental justice analysis for soil and water resources. Based on the soil and water resources analysis, staff has not identified unmitigated significant direct or cumulative impacts resulting from the construction or operation of the project. Therefore, there are no soil and water resource environmental justice issues related to this project.

FACILITY CLOSURE

The IEEC is expected to operate for a minimum of 30 years. Closure options range from "mothballing," with the intent of a restart at some time, to the removal of all equipment and facilities.

The facility closure plan will be submitted to the California Energy Commission for approval prior to decommissioning. Compliance with all applicable LORS, and any local and/or regional plans will be required. The plan will address all concerns regarding soil and water resources.

COMPLIANCE WITH LORS

The project as proposed will comply with all relevant LORS if the recommended Conditions of Certification are adopted.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

COUNTY OF RIVERSIDE

Riverside-1 In Riverside County's March 5, 2002 letter to James Bartridge, Project Manager at the CEC, the county provided its criteria for Grading and Erosion Control and for design of storm water facilities associated with the proposed IEEC project that is necessary in order to conform with local land use LORS.

Response: CEC staff will assure that the Applicant's plans are consistent with County of Riverside's criteria and local land use LORS for Grading and Excavation as well as Storm Water Pollution Prevention Plans. Condition of Certification **Soil & Water 1** requires that the Erosion and Sedimentation Control Plan shall be consistent with the standards normally required in Riverside County's Grading and Excavation Permits, for all project elements, including a Geotechnical Soils Report and specification of any areas for import or export of soils, and shall be submitted to the county for review and comment, and to the CPM for review and approval. Condition of Certification **Soil & Water 2** requires that the Storm Water Pollution Prevention Plan (SWPPP) for Construction Activity shall be submitted to the CPM for approval, and for review and comment to the County of Riverside. Condition of Certification **Soil & Water 3** requires that the Storm Water Pollution Prevention Plan (SWPPP) for Industrial Activity shall be

submitted to the CPM for approval, and for review and comment to the County of Riverside. Condition of Certification **Soil & Water 8** requires the applicant to pay a Flood Mitigation Fee in the amount assessed in accordance with Riverside County's Homeland/Romoland Area Drainage Plan (ADP) to assist in providing revenue to establish adequate community drainage facilities. The County's preliminary estimate is that the fee will be based on mitigation for 22 acres at the IEEC site, and 5.8 acres at the proposed compressor station.

CONCLUSIONS AND RECOMMENDATIONS

Staff has determined the proposed IEEC project will result in less than significant impacts to soil and water resources if the following conditions of certification are implemented.

PROPOSED CONDITIONS OF CERTIFICATION

The following conditions have been developed for this project:

SOIL & WATER 1: Prior to beginning any site mobilization, the project owner shall obtain Compliance Project Manager (CPM) approval of an Erosion and Sedimentation Control Plan. The Erosion and Sedimentation Control Plan shall be consistent with the standards normally required in Riverside County's Grading and Excavation Permits for all project elements, including a Geotechnical Soils Report and specification of any areas for import or export of soils. The plan shall be submitted to the CPM for approval, and to the County of Riverside for review and comment.

Verification: The Erosion and Sedimentation Control Plan shall be submitted to the CPM for approval and to the County of Riverside for review and comment at least sixty days prior to start of any site mobilization activities.

SOIL & WATER 2: Prior to beginning site mobilization, the project owner shall submit a Notice of Intent for construction under the General National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Storm Water Associated with Construction Activity to the State Water Resources Control Board (SWRCB). The project owner shall prepare a Storm Water Pollution Prevention Plan (SWPPP) for Construction Activity. The SWPPP shall be submitted to the United States Army Corps of Engineers (USACOE) for consideration of jurisdiction under Section 404 of the Clean Water Act, to Riverside County and the RWQCB for review and comment, and to the CPM for review and approval. The SWPPP will include final construction drainage design consistent with the criteria specified by County of Riverside and specify Best Management Practices (BMP's) for all on and off-site IEEC project facilities. BMP's shall also control soil erosion from storm water drainage below the detention pond and from storm water discharge of the eastern boundary interception ditch and protect the bed and bank drainage feature running parallel to but outside the southern IEEC boundary.

Verification: At least 60 days prior to the start of any site mobilization activities, the SWPPP for Construction Activity and a copy of the Notice of Intent for construction under the General NPDES Permit for Discharges of Storm Water Associated with Construction Activity filed with the SWRCB, shall be submitted to the USACOE, County of Riverside, and the RWQCB for comments and to the CPM for approval.

SOIL & WATER 3: Prior to initiating site mobilization, the project owner shall submit a Notice of Intent for operation under the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity to the State Water Resources Control Board (SWRCB). The project owner shall prepare a Storm Water Pollution Prevention Plan (SWPPP) for Industrial Activity. The SWPPP shall be submitted to the USACOE for consideration of jurisdiction under Section 404 of the Clean Water Act, to Riverside County and the RWQCB for review and comment, and to the CPM for review and approval. The SWPPP will include final operating drainage design consistent with the criteria specified by the County of Riverside and specify BMP's and monitoring requirements for the IEEC project facilities. BMP's shall also control soil erosion from drainage of storm water below the detention pond and from storm water discharge in the eastern boundary interception ditch to protect the bed and bank drainage feature running parallel to but outside the IEEC southern boundary.

Verification: At least 60 days prior to initiating site mobilization, the SWPPP for Industrial Activity and a copy of the Notice of Intent for operating under the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity filed with the SWRCB, shall be submitted to the USACOE, County of Riverside, and the RWQCB for comments, and to the CPM for approval.

SOIL & WATER 4: The project owner shall use tertiary-treated water supplied from Eastern Municipal Water District's (EMWD's) Recycled Water System as its primary source of water for cooling and process water supply. Based on EMWD's projected availability of recycled water supply to IEEC, it is recognized that EMWD may need to augment its recycled water system with fresh water during the early years of IEEC project operation. EMWD's fresh water augmentation to its recycled system will not be supplied directly to IEEC, but rather to it's Perris Water Treatment Plant where it will blend into the overall recycled water system. The project owner will obtain copies of project water-use records derived from EMWD's recycled water revenue meters. In addition, the project owner shall obtain copies of meter records for EMWD's fresh water augmentation to its recycled water system at the Perris Water Treatment Plant. The project owner shall prepare an annual summary, which will include the monthly range and monthly average of daily water usage in gallons per day, and total water used on a monthly and annual basis in acre-feet. The annual summary shall distinguish sources and uses of water according to recycled water supplied for IEEC cooling and process purposes, fresh water for IEEC potable supply, and fresh water augmenting EMWD's recycled water system at the Perris Water Treatment Plant. For years subsequent to the initial year of IEEC operation, the annual summary will also include the yearly range and yearly average water use.

Verification: The project owner will submit to the CPM in the Annual Compliance Report, a water-use summary for the life of the project. Any anticipated changes not consistent with these Conditions of Certification in the water supply for the project, shall be noticed in writing to the CPM at least 60 days prior to the effective date of the proposed change.

SOIL & WATER 5: IEEC has agreed to use recycled water to the fullest extent possible. Recycled water available from EMWD will not be adequate to provide a full supply of recycled water for IEEC and EMWD's other customers for approximately the first seven years of IEEC operation. Following the first seven years, adequate recycled water supply is expected. Soil & Water Table 8 shown here indicates the amount of fresh water that can be augmented to EMWD's recycled water system as attributable to IEEC's process and cooling water demands. This ranges from 1,000 acre-feet/year (afy) during the initial year of project operation, 800 afy in the second year, 600 afy in the third year, 400 afy in the fourth year, 200 afy in the fifth year and 100 afy thereafter. IEEC must manage its water use for cooling and process needs in order to not exceed these maximum limits of fresh water augmentation to EMWD's recycled water system attributable to the IEEC.

Soil & Water Table 8
Maximum Limits of Fresh Water Augmentation to EMWD's Recycled Water System Attributable to IEEC (acre-feet/year)

Year	Recycled Water Available From EMWD	Fresh Water Augmentation Needed To Meet Average 4,150 afy Demands	Fresh Water Augmentation Needed To Meet Peak 4,958 afy Demands	**Maximum Limits of Fresh Water Augmentation Attributable to IEEC**
2005	4,086	64	872	**1,000**
2006	4,276	0	682	**800**
2007	4,465	0	493	**600**
2008	4,628	0	330	**400**
2009	4,769	0	189	**200**
2010	4,888	0	70	**100**
2011 and after	4,958	0	0	**100**

If a recycled water supply deficiency occurs due to an act of God, a natural disaster, an unforeseen emergency or other unforeseen circumstances outside the control of the project owner, additional fresh water in excess of 100 afy can be used. If one of the aforementioned unavoidable circumstances should occur, the CPM, project owner and EMWD shall confer and determine how to restore the recycled water supply as soon as practicable.

Verification: The project owner shall submit a water use summary to the CPM in the Annual Compliance Report for the life of the project. Any change in the water supply for the project during construction or operation of the plant shall be noticed in writing to the CPM at least 60 days prior to the effective date of the proposed change. The project owner shall track its fresh water use on a monthly basis using EMWD's meter readings in order to notify the CPM immediately upon exceeding, or upon forecasting to exceed, the maximum fresh water use as specified in this Soil & Water 5.

SOIL & WATER 6: Prior to initiating project operation, the project owner shall submit evidence of having secured a Service Agreement with EMWD. The Service Agreement shall address recycled water for process and cooling, potable water for domestic and fire protection, process wastewater to be discharged into the non-reclaimable waste line, and sanitary wastewater service. The Service Agreement shall include the Industrial Waste Discharge Permit and Non-Reclaimable Wastewater Discharge Permit as issued by EMWD.

Verification: At least 60 days prior to the start of project operation, the project owner shall submit to the CPM a copy of the executed Service Agreement for IEEC between the project owner and EMWD for obtaining recycled water, potable water, process wastewater discharge and sanitary wastewater service.

SOIL & WATER 7: Following initiation of commercial operation, the project owner shall provide the CPM and the County of Riverside evidence of its submittal of as-built plans and related information as specified in FEMA's Conditional Letter of Map Revision (CLOMR) dated February 20, 2001 in order for FEMA to initiate a revision to the Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) Report. The project owner shall also submit a copy of FEMA's Final Letter of Map Revision (LOMR).

Verification: Within 180 days following initiation of commercial operation of the IEEC, the project owner shall submit to the CPM and the County of Riverside evidence of its submittal of as-built plans and related information in order for FEMA to initiate a revision to the FIRM and FIS Report and issue a LOMR. The project owner shall also submit to the CPM evidence of receipt of the LOMR from FEMA, and a copy of the revised FIRM.

SOIL & WATER 8: Prior to site mobilization, the applicant shall pay a Flood Mitigation Fee in the amount assessed in accordance with Riverside County's Homeland/Romoland Area Drainage Plan (ADP) to assist in providing revenue to establish adequate community drainage facilities. The amount of the fee for industrial development shall be calculated on the basis of the prevailing Area Drainage Plan fee rate multiplied by the area of the new development.

Verification: Within thirty days after certification, the project owner shall submit to the CPM, documentation that payment has been made to the County of Riverside, for the Flood Mitigation Fee.

REFERENCES

Calpine (Calpine Corporation/Hatfield) 2001a. Submittal of Application for Certification, Volume 1 & Appendices, Inland Empire Energy Center (01-AFC-17). Dated August 8, 2001 and docketed August 17, 2001.
Cited in text as: (Calpine 2001a, AFC Section #)

Calpine (Calpine Corporation/Hatfield) 2001e. Data Adequacy Response Set 1. Dated December 4, 2001 and docketed December 4, 2001.
Cited in text as: (Calpine 2001e, Request #)

EMWD (Eastern Municipal Water District) 2002a. Report of Conversation for EMWD Staff Workshop between EMWD, Applicant & CEC Staff at EMWD's office on January 30, 2002 (See Response to Data Request #83).
Cited in text as: (EMWD 2002a)

IEEC (Inland Empire Energy Center) 2002c. Data Request Response Set #1. Dated February 13, 2002 and docketed February 13, 2002.
Cited in text as (IEEC 2002c, Data Request #)

FWEC (Foster Wheeler Environmental Corp/Booth). 2002c. Data Request Response Set #2. Dated February 21, 2002 and docketed February 21, 2002.
Cited in text as (FWEC 2002c, Data Request #)

IEEC (Inland Empire Energy Center) 2002f. Data Request Response Set #3. Dated March 14, 2002 and docketed March 15, 2002.
Cited in text as (IEEC 2002g, Data Request #)

IEEC (Inland Empire Energy Center) 2002g. Report of Conversation for Meeting between Applicant & CEC Staff on April 4, 2002 at the CEC's Office for Clarification of Water Data Requests – Set 1.
Cited in text as: (IEEC 2002g)

IEEC (Inland Empire Energy Center) 2002g. Data Request Response Set #5. Dated May 20, 2002 and docketed May 20, 2002.
Cited in text as (IEEC 2002g, Data Request #)

EMWD (Eastern Municipal Water District) 2002b. Report of Conversation for Teleconference between Charlie Bachmann of EMWD and Greg Peterson & John Kessler of CEC Staff on April 15, 2002.
Cited in text as: (EMWD 2002b)

EMWD (Eastern Municipal Water District) 2002c. Phone Discussion between Charlie Bachmann of EMWD and John Kessler of CEC Staff on June 17, 2002 regarding historical outage duration of recycled water supply.
Cited in text as: (EMWD 2002c)

EMWD (Eastern Municipal Water District) 2002d. MOU dated December 20, 2001 between EMWD and IEEC LLC for the Provision of Recycled Water to the Inland Empire energy Center.
Cited in text as: (EMWD 2002d)

Riverside (County of Riverside) 2002a. Letter dated March 5, 2002 from County of Riverside to Mr. James Bartridge – Project Manger, CEC providing comments for consistency of the proposed IEEC with local land use LORS.
Cited in text as: (Riverside 2002a)

USACOE (United States Army Corps of Engineers) 2002a. Phone Discussion between Robert Smith of the USACOE and John Kessler of CEC Staff on July 10, 2002 regarding Section 404 Nationwide Permit compliance.
Cited in text as: (USACOE 2002a)

TRAFFIC AND TRANSPORTATION

Paul Taylor

INTRODUCTION

The Traffic and Transportation Section of this staff assessment is an objective analysis of the transportation systems in the vicinity of the project. It addresses the Inland Empire Energy Center's (IEEC) compatibility with applicable Laws, Ordinances, Regulations, and Standards (LORS). This assessment also analyzes and identifies potential impacts related to the construction and operation of the project on the surrounding transportation systems and roadways, and potential mitigation measures to avoid or lessen those impacts. It includes the evaluation of the influx of large numbers of construction workers, and how, over the course of the construction phase, the movement of these workers can increase roadway congestion and also affect traffic flow.

Staff has analyzed the information provided in the Application for Certification (AFC) and other sources to determine the potential for the IEEC to have significant traffic and transportation impacts, and has assessed the availability of mitigation measures that could reduce or eliminate the significance of those impacts. Conditions of certification are included to implement the appropriate mitigation measures and to ensure that the project complies with the applicable LORS.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

- Title 49, Code of Federal Regulations. Chapter 11, Subchapter C. These authorities establish national standards for the transportation of hazardous materials.
- Title 49, Code of Federal Regulations, Sections 171-177, governs the transportation of hazardous materials, the type 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.
- Part 77, Federal Aviation Administration (FAA) Regulations, establishes standards for determining obstructions in navigable airspace and sets forth requirements for notification to the FAA of proposed construction. Notification is also required if the structure or obstruction is more than a specified height and falls within any restricted airspace in the approach to airports.

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 rights-of-way. In addition, the California Health and Safety Code addresses the transportation of hazardous materials.

Provisions within the California Vehicle Code are as follows:

- Section 353 defines hazardous materials.
- Sections 31303-31309 regulate the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- Section 31030 identifies commercial shipping routes for specified waste streams.
- Sections 31600-31620 regulate the transportation of explosive materials.
- Sections 32000-32053 regulate the licensing of carriers of hazardous materials and include noticing requirements.
- Sections 32100-32109 establish special requirements for the transportation of inhalation hazards and poisonous gases.
- Sections 34000-34121 establish special requirements for the transportation of flammable and combustible liquids over public roads and highways.
- Sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-7. 34506, 34507.5, and 34510-11 regulate the safe operation of vehicles, including those used for the transportation of hazardous materials.
- Section 25160 et seq. address the safe transport of hazardous materials.
- Sections 2500-2505 authorize the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives.
- Sections 13369, 15275, and 15278 address the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. These sections also require certificates permitting the operation of vehicles transporting hazardous materials.

California Streets and Highways Code, Sections 117 and 660-72, and California Vehicle Code, Section 35780 et seq., require permits for the transportation of oversized loads on county roads.

California Street and Highways Code, Sections 660, 670, 1450, 1460, 1470, and 1480, regulates right-of-way encroachment and the granting of permits for encroachments on state and county roads.

Per the California Department of Transportation (Caltrans), all construction within the public right-of-way will need to comply with the “Manual of Traffic Controls for Construction and Maintenance of Work Zones”.

LOCAL

- Southern California Association of Governments (SCAG) Regional Transportation Plan (RTP) - establishes regional transportation goals, policies, objectives, and

actions for various modes of transportation, including intermodal and multimodal transportation activities. SCAG is the overall administering agency, and the RTP and the related Regional Transportation Improvement Plan are implemented by Riverside County.

- SCAG Traffic Congestion Relief Program - establishes guidelines for development of a balanced transportation system, relating population and traffic growth, land use decisions, level of service (LOS) performance standards, and air quality improvement. SCAG is the administering agency.
- County of Riverside, County General Plan - establishes goals and policies, and identifies implementation measures for County traffic and transportation systems. The Riverside County Board of Supervisors is the administering agency. County Ordinance No. 748 requires project developers to pay a Signal Mitigation Program fee at the time of occupancy or final building permit.

SETTING

REGIONAL SETTING

The IEEC project site is located in an unincorporated portion of Riverside County approximately 15 miles southeast of the city of Riverside, six miles west of the city of Hemet and four miles southeast of the City of Perris. It is near the communities of Romoland and Sun City, and generally southeast of the intersection of Ethanac Road and Antelope Road. Regional access to the site is provided by I-215 from the north and south, and SR 74 from the east and west.

Descriptions of some of the critical roads and highways in the study area are provided below. Figure 5.11-3 in the AFC (Calpine 2001a), attached hereto and referred to as **Traffic and Transportation Figure 1** illustrates the major roads, potential access roads, and highways in the project area.

LOCAL SETTING

I-215 and SR 74 are the two major highways in the area of the project site. Ethanac Road is the primary east-west road providing access to the project site. Ethanac Road turns southeast just east of the BNSF railroad and becomes Matthews Road. Antelope Road, a north-south street intersecting Ethanac Road will provide normal access to the IEEC site. Other north/south and east/west collector roads near the IEEC site include Mapes Road, Watson Road, McLaughlin Road, Rouse Street, Menifee Road, Palomar Road, Trade Winds Road, and Sherman Road.

I-215 provides access to the Moreno Valley and the greater Riverside area north of the project site. I-215 is a controlled access freeway south of the project area between Ethanac Road and Newport Road, while it is a limited access freeway north of Ethanac Road. I-215 consists of two travel lanes in each direction both north and south of Ethanac Road. It has an annual average daily traffic (AADT) of 44,000 vehicles per day (California Department of Transportation [CALTRANS] 1999) both north and south of Ethanac Road.

SR 74 provides access to the cities of Hemet and San Jacinto east of the project site, and the City of Perris located west of the site. SR 74 is a four-lane, east-west expressway within the region. It typically consists of two twelve-foot wide travel lanes in each direction and six to eight-foot wide shoulders. A continuous left turn lane also exists along SR 74 within the vicinity of the project. West of the project site, SR 74 merges with I-215 and then diverges from I-215 at 4th Street. AADT volumes along SR 74 are 18,500 vehicles per day west of Ethanac Road, and 19,500 vehicles per day east of Ethanac Road (CALTRANS 1999).

Ethanac Road consists of two twelve-foot wide lanes (one in each direction), and typically four to six-foot wide shoulders. AADT volumes along Ethanac Road are 3,855 vehicles per day west of SR 74. Ethanac Road provides access to I-215, the community of Sun City, and the City of Perris west of the project site. Ethanac Road's easternmost extent occurs at its intersection with SR 74 and Matthews Road approximately 300 to 400 feet east of Antelope Road.

The Riverside County Transportation Commission (RCTC) (Chase, 2001) and the Riverside County Economic Development Agency (Holland, 2001) indicate that the County, in coordination with Caltrans, is planning to close access from Ethanac Road to SR 74. Traffic between SR 74 and Ethanac Road would be redirected along Matthews Road and Palomar Road. For purposes of analysis, it is assumed that this road closure and traffic realignment project will be complete prior to the construction and operation of the proposed IEEC project.

Ethanac Road turns into Matthews Road immediately after the interconnection between SR 74 and Ethanac Road. Matthews Road parallels the BNSF railroad that borders the northeast boundary of the project site in a northwest-southeast direction. Matthews Road is a two-lane (one lane in each direction) collector with approximately ten-foot wide travel lanes and typically one to three-foot wide shoulders. A stop sign controls traffic at its intersection with Palomar Road. Approximately 1,500 feet southeast of its intersection with Palomar Road, Matthews Road becomes an unimproved, two-lane facility.

Normal access to the IEEC will be from a 24-foot wide, 1,000 feet long extension of Antelope Road from its current terminus south of Ethanac Road. Currently, Antelope Road is primarily an unimproved road oriented in a north-south direction. Approximately 200-300 feet of Antelope Road is paved south of Ethanac Road; the remainder of the roadway south of Ethanac Road is unimproved (i.e. dirt). North of SR 74, Antelope Road is a two-lane, improved (i.e. paved) facility.

ACCIDENT HISTORY

Caltrans reports that I-215 had an accident rate of 0.54 accidents per million vehicle-miles traveled, whereas SR 74 had an accident rate of 1.90 accidents per million vehicle-miles traveled (Griffin 2001). In 1999, countywide average accident rates for freeways were 0.78, whereas the average accident rate for conventional multilane facilities was 1.85 (CALTRANS 2000). These relatively low accident rates generally reflect the LOS C or better conditions of the nearby roadways.

RAILWAYS

The San Jacinto Branch of the BNSF railroad crosses Ethanac Road approximately 500 feet north of the project site. Within the project vicinity, the railroad runs southeasterly (or northwesterly). It runs parallel to Case Road west of I-215 and parallel to Matthews Road east of the project site.

The railroad right-of-way is owned by Riverside County Transportation Commission (RCTC), whereas BNSF maintains and operates the rail line (Chase 2001). Conversations with BNSF revealed that the number of train trips made within the vicinity of the study area is approximately 2 to 3 trips per week (Russeau 2001). Trains in the project vicinity travel at approximately 10 miles per hour (Russeau 2001).

No traffic control system or railroad-crossing signal currently exists where Ethanac Road intersects the railroad, immediately north of the project site. RCTC reports that there are no plans to install a signalization system at this particular location (2001).

PUBLIC TRANSPORTATION

Public transportation in the area is provided by Riverside Transit Agency (RTA) Route 27. Route 27 runs along SR 74 in the project vicinity and connects the communities of Hemet, Perris, Sun City, Moreno Valley, and Mead Valley. There are several bus stops in the vicinity of the project site. The stop closest to the site is approximately a quarter mile north of the site at SR 74 and 4th Street (RTA 2001). Generally, one Route 27 bus runs every 1.5 hours in each direction Monday through Friday. (RTA 2001). No park-and-ride lots for carpooling were identified within 3 miles of the project site (SCAG 2001).

PEDESTRIANS AND BICYCLES

A majority of the roads in the area are narrow, with little or no shoulder and few sidewalks. Within the project area, the Circulation Element of Riverside County's General Plan designates SR 74 a Class II bikeway from east of the project site to I-215 west of the site. West of the intersection of SR 74 and I-215 the bikeway continues parallel to the BNSF Railroad. During field reconnaissance, a few bicyclists were observed using roadway shoulders as travel lanes. Also, an off-road bicycle trail exists along the BNSF Railroad right-of-way southeast of the project site, generally between Ethanac and Menifee Roads.

TRUCKS

The Transportation Element of the Riverside County General Plan does not specifically detail size and weight/load limits for any roadways in the county. Therefore, all applicable regulations are found in California Vehicle Code. Some notable limits are 20,000 pounds per axle and 10,500 per wheel or wheels on one end of the axle.

Existing truck volumes are available based on 1998 Caltrans data for I-215 and SR 74. In 1998 I-215 had an AADT of 44,000 at the back leg (south) of the south junction with SR 74 of which 2,590 were trucks. The AADT for the ahead leg (north) of the south junction with SR 74 was 58,000 of which 6,844 were trucks. In 1998 SR 74 had an

AADT of 15,700 at the back leg (west) of the south junction with I-215 of which 1,836 were trucks. The ahead leg (east) had an AADT of 18,500 of which 1,710 were trucks.

CURRENT ROADWAY AND INTERSECTION OPERATING CONDITIONS

When evaluating a local transportation system, staff uses levels of service (LOS) measurements as the foundation on which to base its analysis. LOS measurements represent the flow of traffic. In general, LOS ranges from "A" with free flowing traffic, to "F" which is heavily congested with flow stopping frequently. The following roadway segments that would be affected by IEEC project traffic operate at acceptable levels of service (LOS C or better) under existing conditions based on daily and peak hour volumes:

- I-215 (4-lane urban freeway)
- North of Mapes Road – LOS C
- Mapes Road to Ethanac Road – LOS A
- South of Ethanac Road – LOS A
- SR 74 (4-lane expressway)
- West of Antelope Road – LOS A
- Ethanac Road to Palomar Road – LOS A
- Palomar Road to Menifee Road – LOS A
- Ethanac Road (2-lane collector)
- Murrieta Road to I-215 – LOS A
- I-215 to SR 74/BNSF Railroad – LOS A
- Matthews Road (2-lane collector)
- Ethanac Road to Palomar Road – LOS A
- Palomar Road (2-lane collector)
- Matthews Road to SR 74 – LOS A
- Menifee Road (2-lane collector)
- SR 74 to Watson Road – LOS A
- Matthews Road to Rouse Street – LOS A

AIRPORTS

The IEEC site is located approximately three miles southeast of the Perris Valley Airport and Parachuting Center, six miles west of the Hemet-Ryan Airport, and 10 miles southeast of the March Air Reserve Base. FAA Form 7460-1 is normally required when new or altered structures are within an airport control zone; which is generally within a five-mile radius (FAA 2002). For airports with runways longer than 3,200 feet, the restricted space extends 20,000 feet (3.3. nautical miles from the runway). The Perris

Valley Airport and Parachuting Center is the only airport with a runway of at least 3, 200 feet that is located within 20,000 feet (3.3 nautical miles1) of the proposed IEEC site.

ANALYSIS AND IMPACTS

PROJECT SPECIFIC TRANSPORTATION RELATED CHANGES

The only permanent change proposed to the existing transportation network is a 24-foot wide and 1,000 feet long extension of Antelope Road from its current terminus south of Ethanac Road. Normal access to the IEEC will be from the extended Antelope Road. The project developer will pave the currently unpaved portion prior to the start of construction. Also, a 20-foot wide loop road will provide internal circulation within the IEEC site.

THRESHOLDS OF SIGNIFICANCE

Significance criteria are based on CEQA Guidelines, the CEQA Environmental Checklist Form (amended December 1, 1999) and on performance standards or thresholds established by responsible agencies.

An impact may be considered significant if the project results in:

- An increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);
- A level of service standard established by the county congestion management agency for designated roads or highways, is exceeded either individually or cumulatively;
- A change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- A substantial increase in hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Inadequate emergency access;
- Inadequate parking capacity;
- A significant hazard to the public or the environment through the transportation of hazardous material.

CONSISTENCY WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Public Resources Code § 25525 states that the Energy Commission shall not certify any facility when it finds "that the facility does not conform with any applicable state, local, or regional standards, ordinances, or laws, unless the [Energy] commission determines

1 A nautical mile contains 6,076 feet, whereas a linear mile contains 5,280 feet.

that such a facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving such public convenience and necessity. In making the determination, the commission shall consider the entire record of the proceeding, including, but not limited to the impacts of the facility on the environment, consumer benefits, and electric system reliability." In no event shall the Commission make any finding in conflict with applicable federal law or regulation.

When determining if a project is in conformance with state, local or regional ordinances or regulations, the Energy Commission typically meets and consults with applicable agencies to determine conformity and, when necessary, "to attempt to correct or eliminate any noncompliance" (§ 25523(d)(1)). The traffic and transportation laws, ordinances, regulations, standards (LORS), and policies applicable to the project have been analyzed in the Impacts section below to determine the extent to which the AEP is consistent or at variance with each requirement or standard.

IMPACTS

The following discussion identifies potential traffic impacts associated with the construction of the IEEC, and provides an explanation of the impact conclusion.

CONSTRUCTION PHASE

Traffic impacts from the IEEC construction were evaluated based on daily, as well as peak hour volumes. The peak month of construction activity was evaluated to provide a conservative (i.e. worst case) analysis. The peak period of construction is expected to occur 12 to 15 months after the start of construction.

Construction Workforce and Truck Traffic

For traffic impact analysis purposes, based on the applicant's construction experience with similar projects (e.g. Delta Energy Center in Contra Costa County), it was assumed that one third of workers would carpool and that this would translate into an average vehicle occupancy of 1.5 persons per vehicle. Also, truck trips were converted to Passenger Car Equivalent (PCE) trips by applying a factor of 2.0 to reflect the additional impact that large trucks have on street system operations beyond that of a normal passenger car, as per the 1985 Highway Capacity Manual.

The table below presents a summary of the trip generation for the project construction phase. For a peak month of construction activity, the proposed project will generate a total of 780 actual one-way vehicle trips per day and approximately 860 PCE one-way trips per day. This includes both construction worker commute traffic and truck traffic.

Trip Generation Summary Table
Construction Phase

	Daily Vehicle Round Trips		Daily Vehicle One-Way Trips		Daily PCE (1) One-Way Trips		Peak Hour PCE (2, 4) Trips	
	Average	Peak (2)	Average	Peak (2)	Average	Peak (2)	Average	Peak (2)
Workers (3)	166	326	332	652	332	652	132	260
Delivery Trucks	15	40	30	80	60	160	3	8
Total	**181**	**366**	**362**	**732**	**392**	**817**	**135**	**268**

(1) A passenger car equivalent (PCE) factor of 2.0 was applied to delivery trucks and heavy trucks.

(2) "Peak" refers to scheduled peak quarter of construction activity (4th quarter 2003).

(3) Assumes 1/3 of workers carpools (1.5 persons per vehicle).

(4) Assumes 80% of workers and 10% or deliveries arrive or depart during peak traffic hour.

Construction traffic impacts to local and regional roads will be determined by the routes used by construction workers and delivery trucks when arriving and departing from the project site. Most workers and deliveries of building supplies and equipment will come from the greater Riverside area. More specifically, for purposes of analysis, the primary route to the site will be south on I-215, east on Ethanac Road, and south on Antelope Road to the site. For the purposes of this analysis, the following assumptions were made:

- When entering or leaving the site at Antelope Road, approximately 75% of the traffic will travel west of the site on Ethanac Road, and the remaining 25% will go southeast on Matthews Road.
- Most of the traffic using Ethanac Road west of the site will originate from the Riverside area; it is assumed that 75% will be from the north (Riverside area), 20% will be from the south (San Diego County area), and the remaining 5% will be from the east (Hemet and San Jacinto area).
- Approximately 80% of the construction workers will arrive or depart during peak traffic hours; 10% of delivery trucks will arrive or depart during peak traffic hours.
- Access to SR 74 from Ethanac Road (and vice versa) will be closed prior to construction of the IEEC, as planned by Riverside County.

RAILWAYS

The San Jacinto Branch of the BNSF railroad crosses Ethanac Road approximately 500 feet north of the project site, and will need to be crossed by IEEC traffic. No traffic control system or railroad-crossing signal currently exists where Ethanac Road intersects the railroad, immediately north of the project site. RCTC reports that there are no plans to install a signalization system at this particular location (Chase 2001). As

part of the construction traffic control plan, traffic control will be coordinated with BNSF to ensure motorists are aware of any railroad trips during construction (See **Condition of Certification TRANS 6**.

LINEAR FACILITIES

Three linear facilities will be constructed in conjunction with the IEEC: a natural gas pipeline, non-reclaimable wastewater pipeline, and transmission interconnection. Each of the linear facilities is discussed below.

Menifee Road Natural Gas Pipeline

Construction of this 0.9-mile long natural gas pipeline route is anticipated to take 1 to 2 months. A peak monthly workforce of approximately 14 employees will be required for pipeline construction. An average workforce of 10 is estimated over the duration of the pipeline construction.

Pipeline construction requires the use of heavy equipment including bulldozers, excavators (backhoe, loader, motor grader, and trencher), cranes, water trucks, and fuel trucks. An estimated 6 pieces of heavy equipment will be used during the short construction period.

Deliveries of heavy equipment, construction materials and supplies, piping, concrete, rebar, miscellaneous consumables, and other construction equipment will be made to the pipeline route by truck.

The pipeline route is approximately 0.9 miles long and the entire route is adjacent to unpaved roads with low existing traffic volumes. Given the short construction period, the limited construction at any one location, the small number of truck deliveries, and their distribution along the route, traffic impacts associated with construction equipment and materials deliveries for the Menifee Road natural gas pipeline will be insignificant.

Non-Reclaimable Wastewater Pipeline

Construction of the non-reclaimable wastewater pipeline is anticipated to take 5 months. A peak monthly workforce of approximately 17 employees will be required during the 2nd through 4th months of pipeline construction. An average monthly workforce of 11 is estimated over the duration of the pipeline construction.

Construction of the non-reclaimable wastewater pipeline requires the use of heavy equipment including bulldozers, excavators (backhoe, loader, motor grader, and trencher), cranes, water trucks, and fuel trucks. An estimated 18 pieces of heavy equipment will be used during the wastewater pipeline peak construction period (the 2nd through 4th months of pipeline construction).

Deliveries of heavy equipment, construction materials and supplies, piping, concrete, rebar, miscellaneous consumables, and other construction equipment will be made to the pipeline route by truck.

The pipeline route is approximately 4.7 miles long and most of the route is adjacent to a combination of paved and unpaved rural roads with low to very low existing traffic

volumes. Except for road crossings, construction vehicles will not be on paved local roads, but will be on agricultural field access roads that parallel the paved roads. Given the short construction period, the limited construction at any one location, the small number of truck deliveries, and their distribution along the 4.7-mile long route, traffic impacts associated with construction equipment and materials deliveries for the natural gas pipeline will be insignificant.

Transmission Interconnection

A new 0.9 mile 500 kV transmission line will be constructed to connect the project switchyard at IEEC to the Southern California Edison (SCE) Valley substation, approximately one mile east of the project site. Construction of the transmission interconnection will take approximately four months. The new transmission structures will be between 80 and 162 feet in height. Given the fact that Perris Valley Airport is the only airport in the project area (2.9 nautical miles northwest), the towers will not impact airport safety and will not require FAA notification or an avigation easement from the Riverside County Airport Land Use Commission (Calpine 2001a, Riverside County 2002a).

The transmission line will be built during the later half of the overall project construction period, and it will involve a work crew from the general labor force for the project. Because construction will be limited both in duration and scope, and will occur in industrial and agricultural areas with very low traffic volumes on nearby roadways, no significant impacts to traffic and circulation are expected.

CHANGES TO LEVEL OF SERVICE

The combination of commute, truck, and visitor traffic associated with the construction phase of the IEEC will increase the volume of traffic in the local area. However, the level of service will not change between existing and “existing plus project” conditions on affected road segments with the addition of daily or peak hour project construction traffic. All of the roadway segments listed previously under existing conditions will remain at the same levels of service, all of which are acceptable levels of service (LOS C or better).

During plant construction, a traffic control plan (see **Condition of Certification TRANS-6**) will be developed and enacted so that traffic flow and access on local roads and intersections will not seriously degrade existing traffic patterns. The traffic control plan will outline what measures will need to be taken on a month-to-month basis based on the expected construction traffic volumes. The construction contractor will be required to prepare a construction traffic control plan and implementation program that addresses timing of heavy equipment and building materials deliveries; an employee trip reduction plan; and signing, lighting, and traffic control device placement.

The following specific best management practices will be incorporated into the construction traffic control plan:

- Truck loads will not exceed legal limits.
- Loads will be covered with full tarp to prevent the wind from blowing materials out of the truck.

- Trucks and trailers will be swept cleaned or hosed after unloading and before entering highway.
- Mufflers, brakes, and all loose items on trucks will be maintained to minimize noise and ensure safe operation.
- Truck operations will be kept to quietest operating speeds. Drivers will be advised to avoid downshifting during vehicle operations through residential communities.
- Traffic control will be coordinated with BNSF to ensure motorists are aware of any railroad trips during construction.

The unpaved section of Antelope Road between Ethanac Road and the project site will be paved prior to construction (See **Condition of Certification TRANS-8**). Pursuant to a request by Riverside County, Antelope and San Jacinto Roads shall have improved rights-of-way (Riverside County 2002b). In addition, as noted in the LORS description earlier, Riverside County Ordinance No. 748 requires that a Signal Mitigation Program fee shall be paid when the final building permit is granted (See Condition of Certification **TRANS-8**). Both of these requests are normal for all project developments that involve county roads (Riverside 2002c).

ROADWAY SIZE AND WEIGHT LIMITS

Occasional transportation of large project components such as the generator turbines may exceed the load size and weight limits of regional and local roadways. Oversize and/or overweight loads will require Overload Limit Permits from Caltrans. Mitigation measures and a condition of certification (see **TRANS-1**) that ensure compliance are discussed later in the Conditions section of this analysis.

OPERATIONAL PHASE

Workforce and Visitor Traffic

The operation of the IEEC will require a labor force of approximately 23 full-time employees with a maximum of 15 employees during the day shift. Sixteen parking spaces will be available for employee and visitor vehicles on a paved lot adjacent to the administration building. It is assumed that the majority of the permanent workforce will reside in the greater Riverside area, and that their preferred route to work will be south on I-215, east on Ethanac Road and south on Antelope Road to the project site. This travel route will easily accommodate the operations related traffic. No significant long-term traffic impacts are expected as a result of the IEEC's operational workforce and visitor traffic.

Truck Traffic

During operation of the IEEC, trucks will periodically deliver/pickup replacement parts, lubricants, liquid fuels, aqueous ammonia, sulfuric acid, trash, and other consumables. On average there will be two truck deliveries (round trips) to the project site per day. The anticipated travel routes for materials delivery will be south on I-215 from the greater Riverside area, then east on Ethanac Road and south on Antelope Road to the project site.

The existing highway and roadway system will not be significantly impacted by the increase in truck traffic associated with the operation of the IEEC. Potential impacts of the transportation of hazardous substances can be mitigated to insignificance by compliance with Federal and State standards established to regulate the transportation of hazardous substances. Mitigation measures and conditions of certification that ensure this compliance are discussed later in this analysis.

CHANGE IN AIR TRAFFIC PATTERNS

The IEEC site is located approximately three miles southeast of the Perris Valley Airport and Parachuting Center, six miles west of the Hemet-Ryan Airport, and 10 miles southeast of the March Air Reserve Base.

As noted above in the LORS and setting descriptions, the Federal Aviation Administration (FAA) Regulations, Part 77 establishes standards for determining obstructions in navigable airspace and sets forth requirements for notification to the FAA of proposed construction. Notification is also required if the structure or obstruction is more than a specified height and falls within any restricted airspace in the approach to airports. For airports with runways longer than 3,200 feet, the restricted space extends 20,000 feet (3.3. nautical miles from the runway). The Perris Valley Airport and Parachuting Center is the only airport with a runway of at least 3, 200 feet that is located within 20,000 feet (3.3 nautical miles) of the proposed IEEC site.

The applicant submitted a Form 7460-1 to the FAA on February 25, 2002. The FAA has determined that the power plant heat recovery steam generators are not a threat or hazard to air operations in the local area (FAA 2002b). However, FAA staff stated on June 26, 2002 that a separate Form 7460-1 will need to be submitted to the FAA regarding the transmission line towers (FAA 2002a). This item will be updated in the Final Staff Assessment after the FAA has completed its determination process. The heights of the HRSG stacks and transmission towers, 195 feet, and 125 feet respectively, do not require an avigation easement from the Riverside County Airport Land Use Commission. Staff believes that the IEEC will not result in a change in air traffic patterns, or constitute any hazard to air traffic safety.

HAZARDS POSED BY DESIGN FEATURE OR INCOMPATIBLE USE

There are no identified roadway features (e.g., sharp curves), dangerous intersections or incompatible uses in the project's vicinity that would cause a substantial increase in roadway hazards.

The San Jacinto Branch of the BNSF railroad crosses Ethanac Road approximately 500 feet north of the project site, and will need to be crossed by IEEC traffic. No traffic control system or railroad-crossing signal currently exists where Ethanac Road intersects the railroad, immediately north of the project site. RCTC reports that there are no plans to install a signalization system at this particular location (Chase 2001). Conversations with BNSF revealed that the number of train trips made in the vicinity of the proposed project is approximately 2 or 3 per week (Russeau 2001). Trains traveling through the project vicinity travel at approximately 10 miles per hour (Russeau 2001). As noted earlier, approximately 75 percent of construction workers will enter or leave Antelope Road and travel west on Ethanac Road. The remaining 25 percent will head

east on Ethanac Road and cross the railroad tracks before turning onto Mathews Road (Calpine 2001a). As part of the construction traffic control plan, traffic control will be coordinated with BNSF to ensure motorists are aware of any railroad trips during construction.

EMERGENCY ACCESS

The Riverside County Fire Department serves the project area; the closest station is Station No. 7, located at 27860 Bradley Road in Sun City, approximately 2.5 miles from the project site (that station is staffed 24 hours every day). The average response time to call is 5 minutes throughout the service area.

Emergency medical services are provided by county sheriff and fire units and by local ambulance services. The closest emergency medical facility to the proposed project site is the Menifee Valley Medical Center, located at 28400 McCall Boulevard in Sun City, about two miles from the proposed project site.

Any emergency vehicles would enter through the plant's main entrance on Antelope Road and then return to Ethanac Road via Antelope Road. The surrounding roadways are all currently and expected to operate at or above an allowable LOS, with no significant decreases expected from the construction or operation of the IEEC facility. Staff has concluded that the IEEC would not impede or affect emergency access; therefore, no impact is expected.

PARKING

The applicant has stated that all parking needs for the construction workforce and construction related trucks will be accommodated on the 46 acre site (Calpine 2001a). A sixteen-space parking lot adjacent to the facility's administration building will be built for use during the operational phase. Staff concurs that these parking plans will be sufficient.

TRANSPORTATION OF HAZARDOUS MATERIAL

Construction of the IEEC will involve hazardous materials and waste including waste oil filters, waste oil, waste paint, waste solvents, spent welding materials, gasoline, diesel fuel, oil, lubricants, paints, and solvents. As noted in the **HAZARDOUS MATERIALS MANAGEMENT** section of the Preliminary Staff Assessment, Conditions of Certification HAZ 10 requires the delivery route of hazardous materials to utilize Interstate 215 to Ethanac Road to Antelope Road and then into the facility. Condition of Certification HAZ-11 requires all vendors not to deliver any hazardous material to the site during hours in the mornings and afternoons when children are going to and from school.

The transportation and handling of hazardous substances associated with the IEEC can increase roadway hazard potential. The handling and disposal of hazardous substances are addressed in the **WASTE MANAGEMENT** and the **HAZARDOUS MATERIALS MANAGEMENT** sections of the Preliminary Staff Assessment. Potential impacts of the transportation of hazardous substances can be mitigated to insignificance by compliance with federal and state standards established to regulate the transportation of hazardous substances. Condition of Certification **TRANS-3** addresses compliance with these regulations.

The State Department of Motor Vehicles specifically licenses all drivers who carry hazardous materials. Drivers are required to carry a manifest, available for inspection by the California Highway Patrol at inspection stations along major highways and interstates. Drivers are also required to check for weight limits and conduct periodic brake inspections. Commercial truck operators handling hazardous materials are also required to take instruction in first aid and procedures on handling hazardous waste spills.

The California Vehicle Code and the Streets and Highways Code (Sections 31600 through 34510) are equally important to ensure that the transportation and handling of hazardous materials are done in a manner that protects public safety. Enforcement of these statutes is under the jurisdiction of the California Highway Patrol. For an in-depth description of the amount and type of hazardous materials that will be used during the construction of the facility, see the **WASTE MANAGEMENT** and **HAZARDOUS MATERIALS MANAGEMENT** sections of the Preliminary Staff Assessment.

CUMULATIVE IMPACTS

Given the relatively low density of other surrounding land uses and the adequate capacity of surrounding roadways, the addition of IEEC construction and operation phase traffic is not expected to have any significant impacts. We have not identified any additional projects planned in the area except for those related to the Menifee North Specific Plan. The 35 acre IEEC site is part of the Menifee North Specific Plan. The applicant indicates that the construction and operational traffic generated by the IEEC would be less than the traffic generated by the site under the Menifee North Specific Plan.

The region will likely continue to experience development and traffic volume growth. Consequently, traffic volumes on the regional roadway system will likely increase. The project's level of traffic generation will diminish between the construction and operational phases such that an increase in background traffic should not be problematic. The addition of IEEC construction traffic to the roadways and highways is not expected to have any significant cumulative impacts. The project's level of traffic generation will diminish between the construction and operational phases such that an increase in background traffic should not be problematic.

FACILITY CLOSURE

The planned life of the generation facility is forty years. At least 12 months prior to the proposed decommissioning, the applicant shall prepare a Closure Plan for submission to the Energy Commission for review and action. At the time of closure all then-applicable LORS will be identified and the closure plan will address how these LORS will be complied with. The effects of the IEEC closure on traffic and transportation will be similar to those discussed for the project itself. Closure will create traffic levels that are similar in intensity and duration to those expected during facility construction. The removal of waste and other materials will produce impacts from truck traffic. At this time, no specific conclusions can be drawn on the effects of project closure on traffic and transportation.

MITIGATION

The applicant should implement the following traffic and transportation mitigation measures:

- Enforce a policy that all project-related parking occurs in designated parking areas.
- Enforce a policy that all project-related traffic travel on Antelope Road from the project site to Ethanac Road in order to access SR 74, I-215, and other areas. Project traffic would not travel on Antelope Road north of Ethanac Road so as to avoid the school located on Antelope Road near Monroe Avenue.
- Obtain and comply with all necessary encroachment and transportation permits from Caltrans, Riverside County, City of Perris, and other jurisdictions regarding the transportation of heavy equipment and hazardous materials and any construction activity within the public right-of-way. Pay a Signal Mitigation program fee when the last permit is received from Riverside County.
- Repair any damages to Ethanac Road, Matthews Road, and Palomar Road incurred during IEEC construction to the road's pre-project construction condition.
- Pave the currently unpaved section of Antelope Road between Ethanac Road and the project site prior to commencing construction. Pavement that provides adequate truck turning radii should be in place to help facilitate safe truck-turning movements. Improve the rights-of-way for Antelope and San Jacinto Roads.
- Extend Antelope Road and build a road for circulation within the IEEC. Normal access to the IEEC site will be from a 24-foot wide, 1,000 feet long extension of Antelope Road from its current terminus south of Ethanac Road. A 20-foot wide loop road will provide internal circulation within the IEEC site. Pavement that sufficiently provides adequate truck turning radii should be in place to help facilitate safe truck-turning movements.
- Prepare a construction traffic control plan to the satisfaction of Riverside County, Caltrans, and the CPM.

COMPLIANCE WITH LORS

The applicant has stated their intention to comply with all federal, state and local LORS. Conditions of certification to ensure compliance are proposed below. Therefore, the project is considered consistent with identified federal, state, and local LORS.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed IEEC power plant (please refer to **Socioeconomics Figure 1** in this Staff Assessment). However, as indicated in Socioeconomics Figure 1, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius; staff considers these to be pockets or clusters. Staff also reviewed Census 1990 information that shows the low-income population is less than fifty percent within the same radius. Because staff have determined there to be pockets or clusters of minority population within the six-mile

radius, staff has conducted a focused environmental justice analysis for traffic and transportation. Based on the traffic and transportation analysis, staff has not identified significant direct or cumulative impacts resulting from the construction or operation of the project. Therefore, there are no traffic and transportation environmental justice issues.

CONCLUSIONS AND RECOMMENDATIONS

During the construction phase, increased roadway demand resulting from the daily movement of workers and materials will slightly increase traffic, although the level of service on each of the studied highway and roadway segments would be unchanged, remaining at an acceptable level of service (i.e. LOS C or better).

During the operational phase, increased roadway demand resulting from the daily movement of workers and materials will be negligible.

All transportation and handling of hazardous substances can be mitigated to insignificance by compliance with federal, state, and local standards and permits established to regulate the transportation of hazardous substances.

The owner should also obtain and comply with all necessary encroachment permits from Caltrans, Riverside County, the City of Perris, and all other jurisdictions related to any construction within the public right-of-way.

Construction activities have the potential to damage local roadways. The applicant should be required to repair damaged roadways to their original condition.

The applicant indicates that parking for the construction workforce will be provided in an area on or adjacent to the project site. The applicant is expected to enforce a policy that all project-related parking occurs in designated parking areas; therefore, construction period parking is not considered a significant project impact.

The addition of IEEC construction traffic to the roadways and highways is not expected to have any significant cumulative impacts. The project's level of traffic generation will diminish between the construction and operational phases such that an increase in background traffic should not be problematic.

The conditions of certification proposed below are those that staff has identified as necessary to mitigate project impacts based on the information available to date. Staff will consider comments received on the Preliminary Staff Assessment and may make some changes to this analysis, and possibly the proposed conditions of certification, in the Final Staff Assessment.

If the Energy Commission certifies the IEEC, staff recommends that it adopt the following conditions of certification.

CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall comply with California Department of Transportation (Caltrans) and Riverside County limitations on vehicle sizes and weights. Overload Limit Permits will be obtained from Caltrans, as necessary. In addition, the project owner or their contractor shall obtain other necessary transportation permits from Caltrans and all relevant jurisdictions for both rail and roadway use.

Verification: In the Monthly Compliance Reports, 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 the start of commercial operation.

TRANS-2 The project owner or its contractor shall comply with California Department of Transportation (Caltrans) and Riverside County limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans, Riverside County, City of Perris, and all other relevant jurisdictions.

Verification: In the Monthly Compliance Reports, the project owner shall submit copies of any encroachment 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 the start of commercial operation.

TRANS-3 The project owner shall ensure that all federal and state regulations for the transport of hazardous materials are observed.

Verification: The project owner shall include in its Monthly Compliance Reports copies of all permits and licenses acquired by the project owner and/or subcontractors concerning the transport of hazardous materials.

TRANS-4 Following completion of project construction of the IEEC and all linear facilities, the project owner shall repair Ethanac, Matthews, and Palomar Roads to their pre-construction condition.

Protocol:

Prior to start of site preparation or earth moving activities, the project owner shall photograph, videotape, or digitally record images of Ethanac Road from I-215 to Matthews Road, Matthews Road from Ethanac Road to Palomar Road, and Palomar Road from Matthews Road to SR 74. The project owner shall provide the CEC Compliance Project Manager (CPM), Riverside County, and Caltrans (as necessary) with a copy of these images. At least 60 days prior to start of site preparation or earth moving activities, the project owner shall also notify Caltrans about the schedule for project construction. The purpose of this notification is to postpone any planned roadway resurfacing and/or improvement projects until after the

project construction has taken place and to coordinate construction related activities associated with other projects.

Verification: Within 30 days after completion of project construction, the project owner shall meet wit the CPM, Riverside County, and Caltrans (as needed) to determine and receive approval for the actions necessary and schedule to complete the repair of identified sections of public roadways to original or as near original condition as possible. The project owner shall provide to the CPM a letter from Riverside County stating their satisfaction with the road improvements.

TRANS-5 During construction of the power plant and all related facilities, the project owner shall enforce a policy that all project-related parking occurs in designated parking areas.

Verification: At least 60 days prior to start of site preparation or earth moving activities, the project owner shall submit a parking and staging plan for all phases of project construction to Riverside County for review and comment, and to the CPM for review and approval.

TRANS-6 The project owner shall develop a construction traffic control plan that outlines what measures need to be taken on a month-to-month basis with input from Riverside County, Caltrans and the CPM. Specifically, the construction Contractor will be required to prepare a traffic control plan and implementation program that addresses timing of heavy equipment and building materials deliveries; employee trip reduction; and signing, lighting, and traffic control device placement. The following specific best management practices will be incorporated into the construction traffic control plan:

- Truck loads will not exceed legal limits.
- Loads will be covered with full tarp to prevent wind blowing materials out of the truck.
- Trucks and trailers will be swept clean or hosed after unloading and before entering highway.
- Mufflers, brakes, and all loose items on trucks will be maintained to minimize noise and ensure safe operation.
- Truck operations will be kept to quietest operating speeds. Drivers will be advised of downshifting and vehicle operations through residential communities.
- Traffic control will be coordinated with BNSF to ensure motorists are aware of any railroad trips during construction.
- Hazardous materials will be delivered to the site by using Ethannac and Antelope Roads when the Romoland School is not in session.

Verification: At least 30 days prior to start of site preparation or earth moving activities, the project owner shall provide the plan to Riverside County and Caltrans for review and comment, and to the CPM for review and approval.

TRANS-7 During construction and operation of the IEEC, the project owner and contractors shall enforce a policy that all project-related traffic travel on Antelope Road from the project site to Ethanac Road in order to access SR 74, I-215, and other areas. Project traffic will not travel on Antelope Road north of Ethanac Road so as to avoid the school located on Antelope Road near Monroe Avenue.

Verification: At least 60 days prior to start of site preparation or earth moving activities, the project owner shall provide a traffic routing plan for all phases of project construction and operation to Riverside County and Caltrans for review and comment, and to the CPM for review and approval.

TRANS-8 The project owner and contractor shall pave the currently unpaved section of Antelope Road between Ethanac Road and the project site prior to commencing construction. Pavement that provides adequate truck turning radii shall be in place to help facilitate safe truck-turning movements. Upon completion of construction, the project owner and contractor shall extend Antelope Road and build a road for circulation within the IEEC site. The 24-foot wide, 1,000 feet long extension of Antelope Road from its current terminus south of Ethanac Road will be used to provide normal access to the IEEC site. A 20-foot wide loop road will provide internal circulation within the IEEC site. Pavement that sufficiently provides adequate truck turning radii shall be in place to help facilitate safe truck-turning movement permits. As noted earlier, Antelope and San Jacinto Roads rights-of-way shall be improved as requested in the March 5, 2002 letter from Riverside County. In addition, a Signal Mitigation Program fee will be required.

Verification: At least 60 days prior to start of site preparation or earth moving activities, the project owner shall submit plans for modifications to Antelope and San Jacinto Roads to Riverside County for review and comment, and to the CPM for review and approval. The project owner shall provide to the CPM a letter from Riverside County stating their satisfaction with the plans. In addition to the letter, the project owner shall provide a copy of the Signal Mitigation Program fee payment to the CPM. Within 30 days after completion of project construction, the project owner shall meet with the CPM, Riverside County and Caltrans (as needed) to determine and receive approval for the actions necessary to complete the Antelope Road extension and internal circulation. The project owner shall submit to the CPM a letter from Riverside County stating their satisfaction with the completed road improvements.

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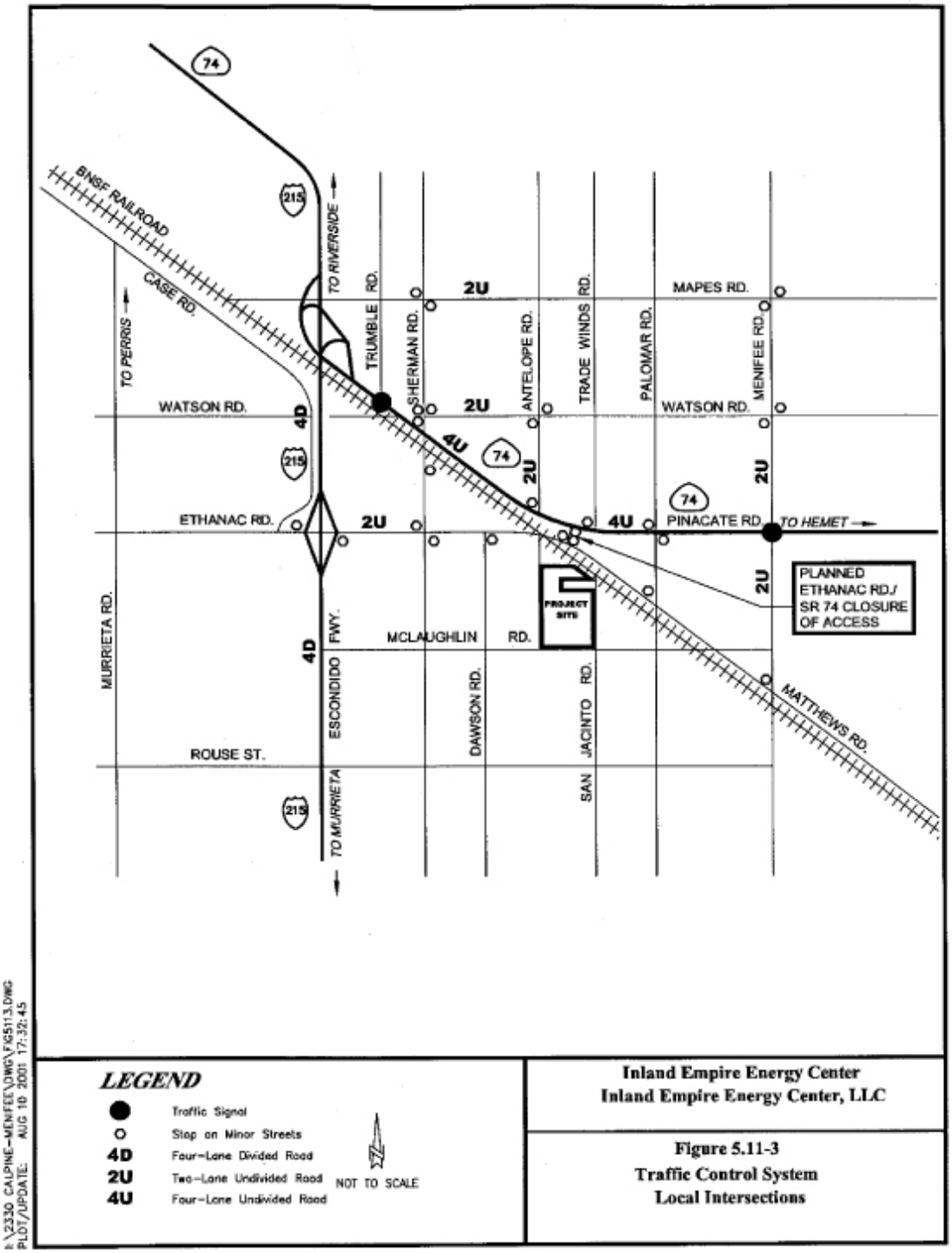
TRAFFIC AND TRANSPORTATION FIGURE 1



TRANSMISSION LINE SAFETY AND NUISANCE

Obed Odoemelam, Ph.D.

INTRODUCTION

The energy from the proposed Inland Empire Energy Center (IEEC) will be delivered to the Southern California Edison (SCE) power grid through a 0.9-mile overhead, 500 kV transmission line that would connect the on-site project switchyard to SCE's Valley Substation to the east of the project site. Since the proposed interconnection line will be operated by SCE (Calpine 2001a, page 3-1), it will be designed and built according to standard SCE practices reflecting compliance with existing health and safety laws, ordinances, regulations, and standards (LORS), as will be discussed later.

The purpose of this staff analysis is to assess the proposed transmission line construction and operational plan for incorporation of the measures necessary to minimize the field and non-field impacts. Reduction of these impacts is the focus of the existing health and safety LORS. If such compliance were established, staff would not recommend further mitigation with respect to the issues of concern in this analysis; if not, staff would recommend revisions as appropriate. Staff's analysis will focus on the following issues as related primarily to the physical presence of the lines or secondarily to the physical interactions of their electric and magnetic fields:

- Aviation safety;
- Interference with radio-frequency communication;
- Audible noise;
- Fire hazards;
- Hazardous shocks;
- Nuisance shocks; and
- Electric and magnetic field (EMF) exposure.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Discussed below by subject area are design-related LORS applicable to the physical impacts of the overhead transmission lines as proposed for IEEC. The potential for these impacts is assessed in terms of compliance with specific federal or state regulations or established industry standards and practices. There presently are no local laws or regulations specifically aimed at the physical structure or dimensions of electric power lines to limit the impacts noted above. However, many local jurisdictions require such lines to be located underground because of the potential for visual impacts on the landscape.

AVIATION SAFETY

Any potential hazard to area aircraft would relate to the potential for collision in the navigable air space. The applicable federal LORS as discussed below are intended to ensure the distance and visibility necessary to prevent such collisions.

Federal

- Title 14, Part 77 of the Code of Federal 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 the aviation hazards of concern.
- 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 produced by the physical interactions of line electric fields. Since electric fields are unable to penetrate most materials, including soil, such interference and other electric field effects are not associated with underground lines. The level of any 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

- Federal Communications Commission (FCC) regulations in Title 47 CFR, Section 15.25. Provisions of these regulations prohibit operation of any devices producing force fields that 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 itself as perceivable interference with radio or television signal reception, or interference with other forms of radio-frequency 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 recommends a specific condition of certification (**TLSN-3**) to ensure compliance with this FCC requirement.

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.

Several design and maintenance options are available for minimizing these electric field-related impacts. When incorporated into the line design and operation, such measures also serve to reduce the line-related audible noise discussed below.

AUDIBLE NOISE

Industry Standards

There are no design-specific federal, state, or local regulations to limit the audible noise from transmission lines. As with radio noise, such noise is limited instead through design, construction, or maintenance practices established from industry research and experience as effective without significant impacts on line safety, efficiency maintainability and reliability. All modern overhead high-voltage lines are designed to assure compliance. As with radio-frequency noise, such audible noise 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, especially in wet weather. Since the noise level depends on the strength of the line electric field, the potential for perception can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during rainfall, but mainly from overhead lines of 345 kV or higher (Electric Power Research Institute 1982).

NUISANCE SHOCKS

Industry Standards

There are no design-specific federal, state, or local regulations to limit nuisance shocks in the transmission line environment. For modern overhead high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code (NESC) and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). Nuisance shocks are caused by current flow at levels generally incapable of causing significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line electric and magnetic fields. As with the proposed overhead line, the applicant will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff recommends a specific condition of certification (**TLSN-2**) to ensure such grounding along the proposed route.

FIRE HAZARDS

The fire hazards 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 and other combustible objects.

State

- General Order 95 (GO-95), CPUC, “Rules for Overhead Electric Line Construction” 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” specifies utility-related measures for fire prevention.

HAZARDOUS SHOCKS

The hazardous shocks addressed through the following regulations and standards are those that could result from direct or indirect contact between an individual and the energized line whether overhead or underground. 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.

State

- 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 ensures the safety of the general public and line workers.
- Title 8, California Code of Regulations, section 2700 et seq., Sections 2700 through 2974. “High Voltage Electric Safety Orders”. These safety orders establish essential requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment

Local

There are no shock hazard-related requirements on the physical dimensions of power lines at the local level.

Industrial Standards

No design-specific federal regulations have been established to prevent hazardous shocks from overhead power lines. Safety is assured within the industry from compliance with the requirements in the National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines. These provisions specify the minimum national safe operating clearances applicable in areas where the line might be accessible to the public. They are intended to minimize the potential for direct or indirect contact with the energized line.

ELECTRIC AND MAGNETIC FIELD (EMF) EXPOSURE

The possibility of deleterious health effects from electric and magnetic field exposure has increased public concern in recent years about living near high-voltage lines. Both fields occur together whenever electricity flows, hence the general practice of describing exposure to them together as EMF exposure. The available evidence as evaluated by CPUC, other regulatory agencies, and staff, has not established that such fields pose a significant health hazard to exposed humans. However, staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore considers it appropriate in light of present uncertainty, to

recommend reduction of such fields as feasible without affecting safety, efficiency, reliability and maintainability.

While there is considerable uncertainty about the EMF/health effects issue, the following facts have been established from the available information and have been used to establish existing policies:

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

State

In California, the CPUC (which regulates the installation and operation of high-voltage lines in California) has determined that only no-cost or low-cost measures are presently justified in any effort to reduce power line fields beyond levels existing before the present health concern arose. The CPUC has further determined that such reduction should be made only in connection with new or modified lines. It required each utility within its jurisdiction to establish EMF-reducing measures and incorporate such measures into the designs for all new or upgraded power lines and related facilities within their respective service areas. The CPUC further established specific limits on the resources to be used in each case for field reduction. Such limitations were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Utilities not within the jurisdiction of the CPUC voluntarily comply with these CPUC requirements. This CPUC policy resulted from assessments made to implement CPUC Decision 93-11-013.

In keeping with this CPUC policy, staff requires evidence that each proposed overhead line will be designed according to the EMF-reducing design guidelines applicable to the utility service area involved. These field-reducing measures can impact line operation if applied without appropriate regard for environmental and other local issues bearing on safety, reliability, efficiency and maintainability. Therefore, it is up to each applicant to ensure that such measures are applied to an extent without significant impacts on line operation and safety. The extent of such applications would be reflected by the ground-level field strengths as measured during operation. When estimated or measured for lines of similar voltage and current-carrying capacity, such field strength values can be used by staff and other regulatory agencies to assess each line for effectiveness at field strength reduction. These field strengths can be estimated for any given design using established procedures. Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m), for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends on line voltage (in the case of electric fields), the geometry of the structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since each new or modified line in California is currently required to be designed according to the EMF-reducing guidelines of the utility in the service area involved, its

fields are required under existing CPUC policies to be of similar intensity to fields from similar lines in that service area. A condition of certification is usually proposed by staff to ensure implementation of the design measures necessary. The applicable condition for this project is **TLSN-4**.

Industrial Standards

There are no health-based federal regulations or industry codes specifying environmental limits on the strengths of fields from power lines. However, the federal government continues to conduct and encourage research necessary for an appropriate policy on the EMF health issue.

In the face of the present uncertainty, several states have opted for design-driven regulations ensuring that fields from new lines are generally similar in intensity to those from existing lines. Some states (Florida, Minnesota, New Jersey, New York, Montana) have set specific environmental limits on one or both fields in this regard. These limits are, however, not based on any specific health effects. Most regulatory agencies believe, as does staff, that health-based limits are inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

Before the present health-based concern developed, measures to reduce field effects from power line operations were mostly aimed at the electric field component whose effects can manifest themselves as the previously noted radio noise, audible noise and nuisance shocks. The present focus is on the magnetic field because only it can penetrate the soil, building and other materials to potentially produce the types of health impacts at the root of the present concern. As one focuses on the strong magnetic fields from the more visible overhead transmission and other high-voltage power lines, staff considers it important for perspective, to note that an individual in a home could be exposed for short periods to much stronger fields while using some common household appliances (National Institute of Environmental Health Services and the U.S Department of Energy, 1995). Scientists have not established which of these types of exposures would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than around high-voltage power lines.

SETTING

According to information from the applicant, Inland Empire Energy Center LLC (Calpine 2001a, pages 1-3, 3-1 through 3-4, 3-66, 5.7-1 through 5.7-30 and 5.15-1 and 5.15-2), the proposed IEEC and related switchyard will be located on approximately 35 acres within a 45.8-acre land parcel approximately ¼ miles to the south of the town of Romoland in unincorporated Riverside County, California. Sun City is located approximately three miles to the southwest. The site is currently used for wheat farming but is zoned for industrial uses. The areas immediately to the east, south, and west are also used for crop farming with an asphalt production facility located immediately to the north. There are a few farm residences in the agricultural lands located to the south of the site.

Two SCE transmission lines (one 500 kV and the other 161 kV) cross over the southernmost portion of the proposed site in an east-west direction as they extend to directly connect to the same SCE Valley Substation that will be used to distribute the power from IEEC. The 0.9-mile route of the project's transmission line will be located within the corridor for these existing lines, which have no nearby residences. The nearest rural residence is approximately 600 feet away (Calpine 2001a, page 4-5), meaning that the residential line-related field exposure at the root of the present health concern would be insignificant for this project. The only project-related EMF exposures of potential significance are the short-term exposures to plant workers, regulatory inspectors, maintenance personnel, approved guests, or individuals in transit across the project's lines. These types of exposures are short term and well understood as not significantly related to the present health concern.

PROJECT DESCRIPTION

The proposed IEEC transmission line will consist of the segments listed below:

- A new 500 kV overhead line within a 0.9-mile route from the project's on-site, 500 kV switchyard to the existing SCE Valley Switchyard to the east;
- The new IEEC 500 kV Switchyard; and
- Relatively minor project-related modifications at specific area 115 kV substations.

As more fully discussed in the information from the applicant (Calpine 2001a pages 3-48, 3-54, and 4-2), the proposed project line will be carried on single-circuit and double-circuit, lattice-type, steel support towers and tubular poles of approximately 80 feet to 162 feet in height. The typical structures and dimensions of these support towers and poles were provided by the applicant as relevant to safety and field reduction effectiveness (Calpine 2001a, pages 3-48 and 3-49, and Appendix I). Details of the proposed tower and conductor placement schemes were also provided. Five support towers will be used. The existing SCE line design will be employed for this IEEC line in keeping with the CPUC requirement for design according to the guidelines of the major utility in the project area. The major utility in this case is SCE whose field-reducing guidelines were established to ensure line design and operation according to existing health and safety LORS. Such design according to applicable guidelines constitutes compliance with CPUC policy on electric and magnetic field management.

IMPACTS

GENERAL IMPACTS

As noted in the LORS section, GO-95, and Title 8, CCR Section 2700 et seq. provide the minimum regulatory requirements necessary to prevent the direct or indirect contact previously discussed in connection with hazardous shocks or aviation hazards. Of secondary concern are the noted field impacts manifesting themselves as nuisance shocks, radio noise, communications interference and magnetic field exposure. The relative magnitude of such impacts would be reflected in the field strengths characteristic of a given line design. Since applied field-reducing measures can affect line operations and safety, the extent of their implementation and resulting field

strengths will vary according to environmental and other local conditions bearing on line safety, efficiency, reliability and maintainability. They will therefore vary from one service area to the other according to prevailing conditions. It would be up to each project proponent to apply such measures to the extent appropriate for the geographic area involved.

PROJECT SPECIFIC IMPACTS

Aviation Safety

The closest airport to IEEC and related facilities is Perris Valley Airport, approximately 2.5 miles northeast of the site. As noted by the applicant (Calpine 2001a, page 4-3), the proposed transmission line does not pose a collision hazard to utilizing aircraft when judged according to current FAA criteria regarding the minimum distance and direction from the primary runway. Furthermore, the line's support towers would (at a maximum height of 162 feet) not be tall enough to pose a collision hazard to area aircraft as defined using the applicable FAA criteria. The same lack of a collision hazard has been true for the two other SCE lines in whose right-of-way the line would be located. While an FAA "Notice of Construction or Alteration" will not be required for the proposed line, the applicant will contact the FAA about the current proposal, as is standard industry practice.

Audible Noise And Interference With Radio-Frequency Communication

The previously noted corona-related communications interference is most commonly caused by irregularities (such as nicks and scrapes on the conductor surface), sharp edges on suspension hardware, and other discontinuities around the conductor surface. The proposed lines will be built and maintained according to SCE practices minimizing such surface irregularities and discontinuities (Calpine 2001a, pages 4-3 through 4-5). Since the potential for such corona-related audible noise and interference is of specific concern for lines of 345 kV and above, the applicant conducted a noise survey that included the area around the existing 500 kV SCE line with which the proposed line would share a right-of-way (Calpine 2001a, pages 5.9-4 through 5.9-13). The results of this survey established the low crackling or sizzling sound from this existing 500 kV line as audible primarily within the right-of-way without adding significantly to the background noise in the area beyond this right-of-way. The low-corona design for the proposed project line would be the same as used for this existing 500 kV line.

Since (a) the edge of the right-of-way usually marks the beginning of the areas of possible human habitation around a high-voltage line, and (b) the nearest human residence is about 600 feet from the proposed route, staff does not expect this IEEC line to generate any complaints about operational noise, or interference with the residential radio or television interference of concern in this analysis. In the unlikely event of specific complaints, the applicant would be responsible for the necessary mitigation as required by the FCC. Staff recommends a specific condition of certification (**TLSN-3**) in this regard. For an assessment of the noise from all phases of the project construction and operation, please see staff's analysis in the **Noise** section.

Fire Hazards

Standard fire prevention and suppression measures for all SCE lines will be implemented for the proposed line. The applicant's intended compliance with the clearance-related aspects of GO-95 would be an important part of this compliance approach (Calpine 2001a pages 4-6 and 6-7). Moreover, the route for the proposed interconnection line will mostly be agricultural land with no trees or brush that would pose a significant hazard of contact-related line fires. Staff recommends condition of certification **TLSN-1** to ensure implementation of the necessary mitigation measures.

Hazardous Shocks

The applicant's noted intention to implement the GO-95- related measures against direct contact with the energized line (Calpine 2001a, pages 4-6 and 6-7) would serve to minimize the risk of hazardous shocks. Staff recommends condition of certification **TLSN-1** to ensure implementation of the necessary mitigation measures.

Nuisance Shocks

The potential for nuisance shocks around the proposed lines will be minimized through standard grounding practices (Calpine 2001a, page 4-6). Staff recommends condition of certification, **TLSN-2** to ensure such grounding.

Electric And Magnetic Field Exposure

The applicant estimated the maximum field strengths possible along the route of a typical 500 kV line (Calpine 2001a, page 4-5, and Appendix 6.18-1) to assess (a) the effectiveness of the field reduction measures to be incorporated into the line design, and (b) evaluate the line's contribution to field exposures associated with the two SCE lines in the proposed right-of-way. The maximum electric field contribution to these existing area levels was estimated as between 1.32 kV/m and 1.7 kV/m at the edge of the right-of-way. Staff is in agreement with the applicant's assumptions with regard to parameters bearing on field strength dissipation and exposure assessment. These values are as staff would expect for SCE lines of the same design and voltage rating and could be compared with values of between 1.0 kV/m and 2.0 kV/m that were established for the edges of the rights-of-way in the states with regulatory limits.

The maximum magnetic field contribution within the right-of-way was estimated as 73 mG, diminishing to 44 mG at the edge of the right-of-way. These magnetic field strength values are what staff would expect for SCE lines of the same voltage and current-carrying capacity and reflect effective incorporation of the applicable reduction measures. The intensity of these magnetic fields would have been higher from using a line of lower voltage since the transmitted power is a product of the applied voltage and current level. These line magnetic fields are of lower intensity than the 150 mG to 250 mG specified for the edges of the rights-of-way by the few states with regulatory limits on line magnetic fields.

The field reduction approaches that are typically employed in the intended line design include the following:

1. Increasing the distance between the conductors and the ground;
2. Reducing the spacing between the conductors; and

3. 3. Minimizing the line current (with specific respect to the magnetic field).

Staff recommends a specific condition of certification (**TLSN-4**) to allow validation of the reduction efficiency assumed by the applicant.

CUMULATIVE IMPACTS

The reported field strengths were estimated by the applicant to reflect the potential contribution of the proposed project line to any area field exposures of a cumulative nature. As reflected in these field strength estimates, the line's potential contribution to any area exposures would be similar to those associated with SCE lines of similar design, voltage, and current-carrying capacity. It is this similarity in field intensity (which reflects the effective implementation of field strength-minimization measures) that constitutes compliance with existing CPUC requirements. The field measurement requirements in **TLSN-4** would allow for assessment of total operational-phase exposures.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population to be less than 50 percent in specific areas within a six-mile radius of the proposed project (as more clearly shown in Socioeconomics Figure 1 in this assessment). However, Census 1990 information shows the low-income population as much less than 50 percent within the same radius. Since this analysis has not identified any significant impacts from the project's transmission line operation, the issue of environmental justice (as potentially related to disproportionate impacts on minority or low-income groups) would not apply to facility operations.

COMPLIANCE WITH LORS

The magnitude of the line impacts of concern in this analysis are within the limits associated with similar transmission lines designed and operated in compliance SCE practices as currently required by CPUC. Staff, therefore, considers the proposed project transmission lines design and operational plan to be in compliance with the health and safety LORS of concern in this analysis.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Since electric or magnetic field health effects have neither been established nor ruled out for overhead and underground lines, the public health significance of any IECC-related field exposures cannot be characterized with certainty. The long-term, mostly residential magnetic exposure at the root of the present health concern will be insignificant for the proposed interconnection line given the general absence of residences along the proposed route. On-site worker or public exposures would be short-term and at levels expected for similar SCE designs and current-carrying capacity.

Such exposures are well understood and have not been established as posing a health hazard to humans.

The potential for nuisance shocks will be minimized through grounding and other field-reducing measures to be implemented by the applicant in keeping with current SCE guidelines reflecting common industry practices. The proposed line support structures are neither tall enough nor close enough to the nearest area airport to pose a significant collision hazard in the navigable space. The use of low-corona line design together with appropriate corona-minimizing construction practices will serve to minimize the potential for corona noise and its related interference with radio-frequency communication in the area around the proposed project line.

RECOMMENDATIONS

Since the project's interconnecting 500 kV lines will be designed to minimize the safety and nuisance impacts of specific concern to staff and routed away from residential areas, staff does not recommend any changes to the proposed construction and operational plan. If the project is approved, staff would recommend that the Energy Commission adopt the conditions of certification specified below to ensure implementation of the measures necessary to achieve the field reduction and safety assumed by the applicant for its related transmission line.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the proposed interconnection transmission lines according to the requirements of CPUC's GO-95, GO-52, Title 8, Section 2700 et seq. of the California Code of Regulations and SCE's EMF reduction guidelines arising from CPUC Decision 93-11-013.

Verification: Thirty days before starting construction of the IEEC's transmission line or related structures and facilities, the project owner shall submit to the Energy Commission's Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the overhead section will be constructed according to the requirements GO-95, GO 52, Title 8, Section 2700 et seq. of the California Code of Regulations, and SCE's EMF-reduction guidelines arising from CPUC Decision 93-11-013.

TLSN-2 The project owner shall ensure that all metallic objects along the route of the overhead section are grounded according to industry standards.

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

TLSN-3 The project owner shall take reasonable steps to resolve any complaints of interference with radio or television signals from operation of the proposed lines.

Verification: Any reports of line-related complaints shall be summarized along with related mitigation measures for the first five years, and provided in an annual report to the CPM.

TLSN-4 The project owner shall engage a qualified consultant to measure the strengths of the line electric and magnetic fields from the proposed lines before and after they are energized. Measurements shall be made at representative points (on-site and along the line route) as necessary to identify the maximum field exposures possible during IEEC operations. If the measurements exceed the levels expected for a line constructed to SCE's EMF reduction guidelines, the project owner shall take corrective action to reduce the levels to the expected levels.

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

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VISUAL RESOURCES

Michael Clayton and Will Walters

SUMMARY

Energy Commission staff analyzed both the potential visual impacts of the proposed Inland Empire Energy Center (IEEC) and the compliance of the project with applicable laws, ordinances, regulations, and standards (LORS). At this time, staff's conclusions are as follows:

- As presently proposed, the project's structures would result in significant visual impacts. Staff has proposed conditions of certification (**VIS-1** through **VIS-3**, **VIS-6**, and **VIS-7**) to more fully develop and implement the applicant's proposed mitigation measures and reduce structure impacts to levels that would not be significant. Staff also proposes that a workshop be convened to discuss the feasibility of specific approaches to landscape screening to meet the requirements of VIS-3.
- Staff has concluded that the proposed project would be consistent with all ten of the identified local LORS pertaining to the enhancement and/or maintenance of visual quality.
- The proposed project's night lighting has the potential to cause significant visual impacts on nearby residences. Staff's Conditions of Certification **VIS-4** and **VIS-5** would reduce lighting impacts to levels that would not be significant.
- Staff is in the process of obtaining additional information necessary to prepare simulations of project vapor plumes. Once the vapor plume simulations are complete, more detailed analyses of vapor plume visual impacts will be conducted. Therefore, staff has not completed the assessment of plume impact significance and will do so in the Final Staff Assessment.

INTRODUCTION

Visual resources are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether IEEC would cause significant adverse visual impacts and whether the project would be in compliance with applicable laws, ordinances, regulations, and standards. The determination of the potential for significant impacts to visual resources resulting from the proposed project is required by the California Environmental Quality Act (CEQA).

ORGANIZATION OF ANALYSIS

This analysis is organized as follows:

- Description of analysis methodology;
- Description of applicable laws, ordinances, regulations and standards;
- Description of the project aspects that may have the potential for significant visual impacts;

- Assessment of the visual setting of the proposed power plant site and linear facility routes;
- Evaluation of the visual impacts of the proposed project on the existing setting;
- Evaluation of compliance of the project with applicable laws, ordinances, regulations, and standards;
- Identification of measures needed to mitigate any potential significant adverse impacts of the proposed project and to achieve compliance with applicable laws, ordinances, regulations, and standards.
- Conclusions and Recommendations; and
- Proposed Conditions of Certification

ANALYSIS METHODOLOGY

Visual resources analysis has an inherently subjective aspect. However, the use of generally accepted criteria for determining impact significance and a clearly described analytical approach aid in developing an analysis that can be readily understood.

Significance Criteria

Commission staff considered the following criteria in determining whether a visual impact would be significant.

State

The CEQA Guidelines define a "significant effect" on the environment to mean a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including...objects of historic or aesthetic significance (Cal. Code Regs., tit.14, § 15382).

Appendix G of the Guidelines, under Aesthetics, lists the following four questions to be addressed regarding whether the potential impacts of a project are significant:

1. Would the project have a substantial adverse effect on a scenic vista?
2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
4. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Local

Energy Commission staff considers any local goals, policies, or designations regarding visual resources. Conflicts with such laws, ordinances, regulations, and standards can constitute significant visual impacts. See the section on Laws, Ordinances, Regulations, and Standards.

Professional Standards

Professionals in visual impact analysis have developed a number of questions as a means of evaluating the potential significance of visual impacts (see Smardon et al. 1986). The questions listed below address issues commonly raised in visual analyses for energy facilities. Staff considers these questions in assessing whether a project would cause a significant impact in regard to any of the four CEQA criteria listed above.

- Will the project substantially alter the existing viewshed, including any changes in natural terrain?
- Will the project deviate substantially from the form, line, color, and texture of existing elements of the viewshed that contribute to visual quality?
- Will the project eliminate or block views of valuable visual resources?
- Will the project result in significant amounts of backscatter light into the nighttime sky?
- Will the project be in conflict with directly identified public preferences regarding visual resources?
- Will the project result in a significant reduction of sunlight, or the introduction of shadows, in areas used extensively by the community?
- Will the project result in a substantial and persistent visible exhaust plume?

Impact Duration

The visual analysis typically distinguishes three different impact durations. **Temporary impacts** typically last no longer than two years. **Short-term impacts** generally last no longer than five years. **Long-term impacts** are impacts with a duration greater than five years.

View Areas and Key Observation Points

The proposed project would be visible from a number of areas in the project region. Energy Commission staff evaluated the visual impact of the project from each of these areas. Staff used Key Observation Points[1], or KOPs, as representative locations from which to conduct detailed analyses of the proposed project and to obtain existing conditions photographs and prepare visual simulations. KOPs are selected to be representative of the most critical locations from which the project would be seen. However, KOPs are not the only locations that staff considered in each view area.

Evaluation Process

For each view area, staff considered the existing visual setting and the visual changes that the project would cause to determine impact significance. Staff conducted a site visit and concluded that the KOPs presented in the Application for Certification (AFC) were appropriate for this analysis. However, staff did request that all photographs and simulations be revised to life-size scale. The results of staff's analysis are summarized in **VISUAL RESOURCES Appendix VR-1**. Existing conditions photographs and

[1] The use of KOPs or similar view locations is common in visual resource analysis. The US Bureau of Land Management and the US Forest Service use such an approach.

photosimulations from each KOP are presented with all other figures in **VISUAL RESOURCES Appendix VR-3**.

Elements of the Visual Setting

To assess the existing visual setting, staff considered the following elements:

Visual Quality

Visual quality is an expression of the visual impression or appeal of a given landscape and the associated public value attributed to the visual resource. This analysis used an approach that considers visual quality as ranging from outstanding to low. Outstanding visual quality is a rating reserved for landscapes that would be what a viewer might think of as “picture postcard” landscapes. Low visual quality describes landscapes that are often dominated by visually discordant human alterations, and do not provide views that people would find inviting or interesting (Buhyoff et al., 1994).

Viewer Concern

Viewer concern is a measurement of the level of viewer interest regarding the visual resources in an area. Official statements of public values and goals reflect viewers’ expectations regarding a visual setting. This analysis also employed land use as an indicator of viewer concern. Uses associated with 1) designated parks, monuments, and wilderness areas, 2) scenic highways and corridors, 3) recreational areas, and 4) residential areas are generally considered to have high viewer concern. However, existing landscape character may temper viewer concern on some State and locally designated scenic highways and corridors. Similarly, travelers on other highways and roads, including those in agricultural areas, may have moderate viewer concern depending on viewer expectations as conditioned by regional and local landscape features. Commercial uses and their occupants, including business parks and hotels, typically have low-to-moderate viewer concern, though some commercial developments have specific requirements related to visual quality, with respect to landscaping, building height limitations, building design, and prohibition of above-ground utility lines, that indicate high viewer concern. Industrial uses typically have the lowest viewer concern because workers are focused on their work, and generally are working in surroundings with relatively low visual value.

Viewer Exposure

The visibility of a landscape feature, the viewing distance to the landscape feature, the number of viewers, and the duration of the view all affect the exposure of viewers to a given landscape feature. Visibility is highly dependent on screening and angle of view. The smaller the degree of screening and/or the closer the feature is to the center of the view area, the greater its visibility is. Increasing distance reduces visibility. Viewer exposure can range from low values for all factors, such as a partially obscured and brief background view for a few motorists, to high values for all factors, such as an unobstructed foreground view from a large number of residences.

Visual Sensitivity

The overall level of sensitivity of a view area to impacts due to visual change is a function of visual quality, viewer concern, and viewer exposure and can range from low to high.

Types of Visual Change

To assess the visual changes that the project would cause, staff considered the following factors:

Contrast

Visual contrast describes the degree to which a project's visual characteristics or elements (consisting of form, line, color, and texture) differ from the same visual elements established in the existing landscape. The degree of contrast can range from low to high. The presence of forms, lines, colors, and textures in the landscape similar to those of a proposed project indicates a landscape more capable of accepting those project characteristics than a landscape where those elements are absent. This ability to accept alteration is often referred to as visual absorption capability and typically is inversely proportional to visual contrast.

Dominance

Another measure of visual change is project dominance. Dominance is a measure of a feature's apparent size relative to other visible landscape features and the total field of view. A feature's dominance is affected by its relative location in the field of view and the distance between the viewer and the feature. The level of dominance can range from subordinate to dominant.

View Blockage

View blockage describes the extent to which any previously visible landscape features are blocked from view by the project. Blockage of higher quality landscape features by lower quality project features causes adverse visual impacts. The degree of view blockage can range from none to high.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following discussion of Federal, State, and Local laws, ordinances, regulations, and standards is based on Section 5.10.5 (LORS) of the Application for Certification (Calpine 2001a, AFC pages 5.10-27 through 37), a review of local planning documents, and consultation with local agency planning staff.

FEDERAL

The proposed project is located on private land. Therefore, the project is not subject to federal regulations pertaining to visual resources.

STATE

In the project vicinity, State Route 74 (SR-74) has been designated "eligible" for State Scenic Highway status but has not yet been designated "scenic" (Caltrans 2002). Once

a highway has been designated scenic, the local jurisdiction is required to enact a scenic corridor protection program that protects and enhances scenic resources. A properly enforced program can mitigate the effects of uses that might otherwise detract from the scenic values of the corridor landscape. A corridor protection program would typically stipulate specific siting, landscaping, and screening requirements; as well as require appropriate structural characteristics and surface treatments to make new development more compatible with the existing environment.

LOCAL

The proposed project would be subject to LORS of several local jurisdictions. All of the proposed project's facilities except the short segment of the wastewater pipeline that falls within the City of Perris are subject to the Riverside County Comprehensive General Plan. The proposed Energy Center site, and portions of the water lines, gas line, and transmission interconnection to Valley Substation are located within the jurisdiction of the Menifee North Specific Plan. The portion of the wastewater pipeline from Milepost (MP) 1.2 to MP 4.9 is located within the jurisdiction of the Sun City/Menifee Valley Community Plan. A 0.4-mile segment of the wastewater pipeline that would be installed within the right-of-way of McLaughlin Road would be subject to the City of Perris General Plan.

Also, Interstate 215 (I-215) south of McCall Boulevard, McCall Boulevard between I-215 and Menifee Road, and Menifee Road between McCall Boulevard and SR-74 have been designated Eligible County Scenic Highways. Relevant local LORS and an assessment of the project's LORS consistency are presented in a later section of this analysis.

PROJECT DESCRIPTION

The following section describes the aspects of the project that may have the potential for significant visual impacts and includes the power generation and associated facilities, switchyard and electric transmission interconnection, natural gas pipeline, and wastewater pipeline (see **PROJECT DESCRIPTION Figures 3 and 6**).

POWER PLANT AND ASSOCIATED FACILITIES

The proposed generating facility would be located on a 45.8-acre property located just south of Romoland, an unincorporated community in Riverside County. On the west, the site is bordered by the partially paved alignment of Antelope Road, and on the east, by an unpaved section of San Jacinto Road. On the south, the site is bordered by an approximately 300-foot wide Southern California Edison transmission line right-of-way that extends along the north side of McLaughlin Road. On the north, the site is bordered by an Asphalt plant and a short segment of the BNSF rail line (Calpine 2001a, p. 5.10-2).

Table 1 presents the dimensions for a number of the project's key components. The most visible features of the proposed power generation facilities would include the two 195-foot tall HRSG stacks, the two 108-foot tall HRSGs, the 80-foot tall auxiliary boiler stack, the 59-foot tall, 840-foot long (approximately) cooling tower consisting of 14 cells, and 43-foot tall recycled water tank (see **PROJECT DESCRIPTION Figures 7** and **8**).

Also, a 20-foot high sound wall would extend across the entire width of the Energy Center and switchyard in the area immediately south of the cooling tower. Chain link fencing would be installed along each of the remaining edges of the entire 25-acre enclosed site and would also be used to separately enclose the switchyard, storm water detention pond, and other areas requiring controlled access (Calpine 2001a, p. 5.10-13). On-site storm water runoff is proposed to be collected and directed to a sedimentation/detention basin located at the southwest corner of the site. This basin would consist of a square excavated area, approximately 250 feet on a side, surrounded by a chain-link fence.

Table 1
Dimensions of Key Project Components

Component	**Height** (feet)	**Length** (feet)	**Width** (feet)	**Diameter** (feet)
HRSG Units				
HRSG Casings		143	15-52	
To top of HRSG Casings	73			
To Operating Decks	80			
To top of Relief Valves & Vents	108			
HRSG Stacks	195			18.5
Combustion Turbines				
Combustion Turbines	26-40	100	33	
Combustion Turbine Air Inlet Filters	65	52	45	
Steam Turbine Generator				
STG Enclosure	55	100	26	
Cooling Tower (14 cells)				
Height to Top of Deck	45			
Height to Tom of Fan Stacks	59			
Structure Length and Width		840	66	
Fan Stack Diameter				38
Auxiliary Boiler Stack	80			4
Emergency Generator Stack	35			1
Tanks				
Recycled Water Storage Tank	43			110
Demineralized Water Storage Tank	25			40
Fire Water Storage Tank	34			40
Condensate Surge Tank	25			40
Non-reclaimable Wastewater Tank	25			40
Buildings				
Administration and Control Building	30	150	90	
Water Treatment/Oil & Chemical Storage	30	125	70	
Fire Pump House	20	40	30	
Cooling Tower Chemical Feed Building	20	40	25	
Switchyard				
Switchyard Bus Structures	48			
T-Line Take-off Structure	100	80		
Switchyard Control Building	20	45	30	
Transmission Line Structures	162 (max)			
Sound Wall	20	1,160		

Source: Calpine 2001a, AFC Table 5.10-2

The proposed project would include site landscaping that would include a grouping of tall conifers at the plant entry off of Antelope Road. A row of medium height, deciduous

trees would be planted north of the entrance on Antelope Road. A mix of deciduous trees and tall broad leaf evergreen trees would be planted along the north, east and south perimeters. South of the entrance on Antelope Road (west side of project site), a row of medium height, deciduous trees would be planted adjacent to the road and a row of tall evergreen trees would be planted behind them (to the east).

SWITCHYARD

A new on-site switchyard would be located immediately east of the generation facilities. Components of the new switchyard, including transformers, take-off structures, and other electrical equipment, would have an industrial appearance similar to that of the components in the nearby Valley Substation. The A-frame take-off structures would be 100 feet in height.

ELECTRICAL TRANSMISSION INTERCONNECTION

Power generated by the proposed project would be transferred over a new 0.9-mile long, double circuit 500 kV transmission line (only one circuit would be used by IEEC). The transmission conductors would leave the switchyard by means of a 100-foot high H-shaped take-off structure (Calpine 2001a, p. 5.10-16). The interconnection would exit the switchyard to the south and then turn east to parallel the existing SCE 500 kV transmission line to Valley Substation, approximately 0.7 mile east of the proposed project site. **PROJECT DESCRIPTION Figure 3** shows the location of the proposed transmission line. The new 500 kV line would be carried on “tetra” style lattice steel towers that would range up to a maximum height of 162 feet (see **PROJECT DESCRIPTION Figure 7**). At the crossbars, the towers would be 107 feet wide. The transmission structures would be given a neutral gray finish that would minimize reflectivity and would be similar to the color of the existing transmission structures. Non-specular conductors would be used to reduce the visibility of the conductors, and insulators would be non-reflective and non-refractive (Calpine 2001a, p. 5.10-16).

NATURAL GAS PIPELINE AND COMPRESSOR STATION

The proposed Menifee Road natural gas pipeline would entail the construction of a new 0.9-mile pipeline that would connect with an existing Sempra gas transmission line at Menifee Road (see **PROJECT DESCRIPTION Figure 3**). The pipeline would be located in the rights-of-way of Junipero, Matthews, McLaughlin, Menifee, and San Jacinto Roads. The new gas compressor station would be located on a 6.69-acre parcel located northeast of the intersection of Rouse Road and Junipero Road (Calpine 2001a, p. 5.10-3), approximately 0.8 mile southeast of the proposed power plant site. The largest structure at the compressor station would be the building that houses the compressors. The compressor building would be 50 feet wide, 80 feet long, and 25 feet high. The compressor station would also include a number of aboveground pipes and tanks. The tallest of these structures would be 22.5 feet high.

All equipment and structures at the compressor station would be treated with a gray-taupe color. In addition, the facility would be surrounded by a solid fence, and a border of trees would be planted around the perimeter to provide screening (Calpine 2001a, p. 5.10-17). Landscaping would consist of medium height, broad leaf evergreen trees along the east, north, and west agricultural perimeters (Calpine 2001a, AFC Figure

5.10-4). A row of medium height deciduous trees would be planted along the south (Rouse Road) street frontage along with informal groupings of tall shrubs.

WATER SUPPLY PIPELINE

The primary source of the cooling water required by the plant would be from an existing recycled water line buried in the right-of-way along McLaughlin Road, just south of the proposed project site (see **PROJECT DESCRIPTION Figure 3**). This existing line would be tapped by a 2,000-foot long underground pipeline that would travel south from the project site to an existing water line at McLaughlin Road.

WASTEWATER PIPELINE

The IEEC's process non-reclaimable wastewater would be transported from the plant by a 12- to 18-inch diameter, 4.7-mile long pipeline to an existing brine line located on the southwest side of Sun City (see **PROJECT DESCRIPTION Figure 3**). The pipeline would be located in the rights-of-way of McLaughlin and Murrieta Roads (Calpine 2001a, p. 5.10-4).

CONSTRUCTION LAY DOWN AREA

Construction of the proposed project is expected to take place during a 25-month period. During the construction period, parking for construction workers and laydown of equipment would take place on the portions of the project site located to the north and south of the 22.5-acre area that would be occupied by the Energy Center.

SETTING

REGIONAL LANDSCAPE

The proposed project would be located in Riverside County in the vicinity of Romoland. This area lies east of the City of Perris and 20 miles south of the City of Riverside. The regional landscape consists of broad, flat alluvial plains that are punctuated by small, rocky hills, and bordered by treeless buttes that rise up to 300 feet or more above the valley floor. The valleys are typically surrounded by arid, undeveloped hill lands, and much of the flat land on the plains is devoted to a mix of irrigated and dry-farmed field crops. Developed communities within the immediate project vicinity include Romoland, Perris, and Sun City. These areas exhibit landscape characteristics typical of a built urban environment. Electric transmission infrastructure is also a prominent presence in the regional landscape with Southern California Edison's (SCE) 500 kV Valley Substation serving as the hub of the regional transmission and distribution system.

Although much of the project vicinity landscape has a rural or quasi-rural appearance, it is in reality a landscape that is in transition to a more uniformly urbanized level of development. Indeed, much of the area's now-open agricultural lands will likely be converted to suburban density residential and commercial uses, and to industrial use. Such conversion is already starting to take place in the Interstate 215 (I-215) corridor with the construction of residential tract developments (Calpine 2001a, p. 5.10-2).

PROJECT VIEWSHED

The distance zones used within this analysis are defined as *foreground* (0 to 1/2 mile), *middleground* (1/2 to 2 miles), and *background* (beyond 2 miles). Within these zones of influence are a number of viewing opportunities. Most views in the project region that are outside of the more developed areas encompass broad, sweeping expanses defined by distant buttes and even more distant mountains and ridgelines. In the more developed areas of the project region, views are often limited to some degree by foreground structures and trees. Most foreground to middleground views of the proposed project would be limited to nearby residences and roadways (including but not limited to I-215, SR-74, Ethanac Road, McLaughlin Road, Matthews Road, and Menifee Road).

The unabated plumes from the HRSG stacks and cooling tower (based on a 10 percent frequency of occurrence during seasonal daylight hours from November through April) would rise approximately 436 feet (for the HRSG) and 361 feet (for the cooling tower) and extend downwind approximately 299 feet for the HRSG and 653 feet for the cooling tower. Therefore, the viewshed of the plumes would extend substantially farther out across Perris Valley than the viewshed for the structures and would include more distant residential areas and roadways generally within the area defined by Sun City on the west, Nuevo on the north, Homeland on the east, and McCall Boulevard on the south.

IMMEDIATE POWER PLANT VICINITY

The visual character of the immediate project vicinity reflects several types of human use. In addition to being a rural agricultural landscape, it is also a landscape in which energy infrastructure and industrial facilities have been sited, creating a scene that is a mosaic of the rural and technological. The proposed project site is flat and open, and at present it is used for dry farming of grains. The vegetation colors on the project site are transitional and affected by the seasonal crop patterns. The grain field on the site extends into the SCE right-of-way that borders the parcel along its southern edge. SCE uses this right-of-way for a single circuit 500 kV transmission line carried on lattice steel towers and for a set of closely spaced wood poles that carry both distribution lines and a 115 kV transmission line. The parcels to the east of the proposed project site are generally open in character and are used for the storage of recycled asphalt. A large area located immediately to the west of the project site in the area between Antelope and Dawson Roads is fenced off and used for the storage of construction equipment. The parcel to the north of the project site is occupied by an active asphalt plant that includes elevated hoppers and a related set of aerial conveyor belts and conveyance tubes as well as large piles of gravel. The tallest structure at the existing asphalt plant is the 75.2-foot tall feed silo (FWEC 2002c, p. 95).

Other uses in the immediate project vicinity include a concrete block plant, a foundry, and a crematorium (Calpine 2001a, p. 5.10-2). East of the project site is Valley Substation, from which a number of electric transmission lines radiate out across the level to rolling landscape. The immediate vicinity also includes residential uses to the northwest, southwest, and south of the project site. Additional residential subdivisions

are being developed to the southwest of the site as the landscape continues to transition from a rural agricultural to suburban character.

SWITCHYARD AND ELECTRICAL TRANSMISSION INTERCONNECTION

The proposed electrical transmission interconnection is located within the immediate power plant vicinity, described above.

WATER SUPPLY PIPELINE

The proposed water supply pipeline is located within the immediate power plant vicinity, described above.

CONSTRUCTION LAYDOWN AREAS

The proposed construction laydown areas are located within the immediate power plant vicinity, described above.

GAS SUPPLY PIPELINE

The proposed gas supply interconnection is located within the immediate power plant vicinity, described above.

WASTEWATER PIPELINE

VISUAL RESOURCES Figure 1 shows the location of the proposed wastewater pipeline and the locations where photographs were taken to illustrate the landscape conditions along the route. The following discussion of the pipeline route photographs is taken directly from the Applicant's response to staff's Data Request #137 (FWEC 2002c, pp. 92-94).

VISUAL RESOURCES Figure 2 (Photo 1) is a view of the Sun City Regional Water Reclamation Facility (RWRF) where the non-reclaimable wastewater line serving the proposed project would begin. The Sun City RWRF is located on the north side of the Salt Creek Channel and is set back approximately 1,000 feet from Murrieta Road. A paved road providing access to the wastewater facility passes through the setback area, and a portion of the setback area is occupied by a fenced area used for agricultural education by a local high school. The rest of the setback area consists of bare, undeveloped land. Starting in the area in front of the wastewater treatment facility, the pipeline would extend northward for 2.6 miles, following an alignment under Murrieta Road. For most of this distance, the pipeline route passes through the unincorporated community of Sun City.

VISUAL RESOURCES Figure 3 (Photo 2) is a view looking north along Murrieta Road in the area in front of the wastewater treatment facility. The vacant setback area in front of the wastewater treatment plant is visible on the west (left) side of the street. The vegetation on the right side of the street is a hedge along the edge of the Rancho del Sol residential community. The homes on the other side of the hedge front onto interior streets.

VISUAL RESOURCES Figure 4 (Photo 3) is a view looking north along Murrieta Road at Sun City Drive. This view is typical of conditions along a 1.6-mile section of Murrieta Road in the central portion of Sun City, where in many areas, single family homes front on both sides of the street.
VISUAL RESOURCES Figure 5 (Photo 4) is a view looking north along Murrieta Road in the area just north of McCall Boulevard. In this area, the residential developments on both sides of the road are oriented to internal street systems, so no homes front on Murrieta Road. As Photo 4 indicates, the residential areas are buffered from Murrieta Road either by walls, or by a combination of setbacks, walls, and landscaping. This type of residential pattern is interspersed with areas of open, undeveloped lands along the 1.35-mile segment of Murrieta Road between McCall Boulevard and McLaughlin Road.

VISUAL RESOURCES Figure 6 (Photo 5) is a view looking east on McLaughlin Road, immediately east of Murrieta Road. In this area, the pipeline right of way lies under an unpaved segment of McLaughlin Road. The pipeline route passes by a one-block area of low density rural residential development, and then extends approximately 0.65 mile eastward through an area of open agricultural land before reaching Interstate 215 (I-215). The area on the north side of the road is occupied by an electric transmission corridor that now accommodates a 115 kV transmission line and a 500 kV transmission line. In this view, I-215 is visible as the white line that defines the far end of the open fields visible in the middleground.

VISUAL RESOURCES Figure 7 (Photo 6) is a view looking east on McLaughlin Road, from a viewpoint immediately to the east of the rural residential area visible in Photo 5. In this view, the open agricultural lands on both sides of McLaughlin Road can be seen. In addition, this photo provides an unobstructed view of the agricultural/infrastructure character of the lands alongside I-215 in the area where the pipeline right-of-way crosses under the freeway.

VISUAL RESOURCES Figure 8 (Photo 7) is a view looking east on McLaughlin Road from its intersection with Encanto Drive, which lies immediately to the east of I-215. McLaughlin Road is paved for approximately one block in this area before reverting to an unpaved track. As this photograph suggests, the area to the south of McLaughlin Road is now being developed as a residential area. The homes that have been developed to date do not front on McLaughlin Road, but rather are buffered from it by walls along their back lot lines. The area to the north side of the road is occupied by the electric transmission corridor that now accommodates a 115 kV transmission line and a 500 kV transmission line. North of the transmission corridor, the land remains in agricultural use.

VISUAL RESOURCES Figure 9 (Photo 8) is a view looking east along McLaughlin Road from its intersection with Trumble Road. This view is typical of the conditions that exist for the approximately 0.8-mile segment of the right of way that extends from Trumble Road to the project site. In this area, McLaughlin Road is unpaved, and is bordered by the 115/500 kV transmission corridor on the north. For the most part, the land on the north side of the road consists of open parcels in agricultural use; the exception is at the intersection of Dawson Road, where there is a cluster of rural residences that front on Dawson Road north of the transmission corridor. On the south

side of McLaughlin Road, there are several areas where large rural residential parcels back up to the road.

VIEWING AREAS AND KEY OBSERVATION POINTS

Staff evaluated the visual setting and proposed project in detail from several viewing areas represented by six key observation points including: (1) Dawson Road at Almaden Lane, (2) Dawson Road at McLaughlin Road, (3) Ethanac Road near Tyler Avenue, (4) Spring Winds Drive at North Winds Drive, (5) State Route 74 at the exit from the post office parking lot, and (6) Menifee Road just north of Rouse Road.

Each of these key observation points is shown on **VISUAL RESOURCES Figure 10**. At each KOP a visual analysis was conducted, the results of which are presented in Appendix VR-1. Existing conditions photographs are presented in Appendix VR-3. A discussion of the visual setting for each KOP is presented in the following paragraphs.

KOP 1 – Dawson Road at Almaden Lane

KOP 1 is located northeast of the intersection of Dawson Road and Almaden Lane, approximately 0.5 mile southwest of the proposed site's southwestern boundary. This viewpoint was selected to represent residential views toward the proposed project from the southern portion of Dawson Road. It also represents views that would be experienced by residents of the rural residential neighborhood along Almaden Lane and Airstream Way at times when they would drive out of the area by way of Dawson Road. **VISUAL RESOURCES Figure 11A** shows the view from KOP 1 to the northeast toward the project site.

Visual Quality

The foreground to middleground agricultural landscape is flat and generally nondescript. The most prominent features are the foreground level fields, electric transmission infrastructure in the SCE corridor, and the rounded, rocky Lakeview Mountains in the background. Also prominent in the landscape is a collection of trailers and old vehicles and equipment. Overall visual quality is low-to-moderate.

Viewer Concern

Since Dawson Road and Almaden Lane primarily serve local traffic, most motorists on these roads and adjacent residents would be sufficiently familiar with local conditions to anticipate a foreground to middleground rural agricultural landscape with a prominent energy transmission infrastructure presence. However, viewers' expectations would also include generally open, panoramic vistas across the flat fields to the rocky hills to the north and east. Although such views are partially obscured by the intermittent presence of transmission structures, the lattice construction of the towers renders them partially "transparent" and prevents the complete blockage of the hills beyond. Any additional blockage of views along either roadway or from nearby residences or introduction of features with industrial character would be perceived as an adverse visual change and viewer concern is moderate-to-high.

Viewer Exposure

While site visibility is generally high in that the view of the site from KOP 1 is open and unobstructed at a foreground viewing distance of approximately 0.5 mile, some of the residential views along Almaden Lane and Airstream Way are partially screened by structures, trees, and other foreground elements. Although the number of viewers is low, the duration of view can be extended and overall viewer exposure is moderate-to-high.

Overall Visual Sensitivity

For motorists on Dawson Road and Almaden Lane and nearby residents, the low-to-moderate visual quality somewhat tempers the moderate-to-high viewer concern and viewer exposure. The resulting overall sensitivity of the visual setting experienced from KOP 1 is moderate.

KOP 2 –Dawson Road at McLaughlin Road

KOP 2 is located near the intersection of Dawson Road and McLaughlin Road, approximately 0.28 mile southwest of the proposed site's southwestern boundary. This viewpoint was selected to represent views toward the proposed project from the eight residences that cluster around this intersection, three mobile homes located in the construction equipment storage yard adjacent to McLaughlin Road and slightly east of Dawson Road, and the residents of the rural residential area to the south of this KOP as they travel north along Dawson Road. **VISUAL RESOURCES Figure 12A** shows the view from KOP 2 to the northeast toward the project site.

Visual Quality

From this viewpoint, the major landscape features are the expanse of flat, open agricultural land in the foreground, the rounded, rocky Lakeview Mountains in the background, and the developed features in the middleground that include industrial structures and SCE's 500 kV transmission line with approximately 128-foot towers and the 115 kV wood pole line located immediately adjacent to the northern edge of McLaughlin Road. Located on the fringe of suburban development, this rural landscape generally lacks features of intrinsic beauty or visual interest and overall visual quality is low-to-moderate.

Viewer Concern

Dawson and McLaughlin Roads serve local residential traffic. Therefore, most travelers on these roads and adjacent residents would be sufficiently familiar with local conditions to anticipate a foreground to middleground rural agricultural landscape punctuated with industrial uses and a noticeable energy transmission infrastructure presence. However, viewers' expectations would also include generally open, panoramic vistas across the flat fields to the rocky hills to the north and east. Although such views are partially obscured by the intermittent presence of transmission structures, the lattice construction of the towers renders them partially "transparent" and prevents the complete blockage of the hills beyond. Any additional blockage of views along either roadway or from nearby residences or introduction of features with industrial character would be perceived as an adverse visual change and viewer concern is moderate-to-high.

Viewer Exposure

Site visibility is high in that the view of the site from KOP 2 is open and unobstructed at a foreground viewing distance of approximately 0.28 mile. The number of viewers is low though the duration of view for residences would be extended and brief for travelers. Overall viewer exposure is moderate-to-high for residents and moderate for travelers.

Overall Visual Sensitivity

For travelers on Dawson and McLaughlin Roads and nearby residents, the low-to-moderate visual quality somewhat tempers the moderate-to-high viewer concern and viewer exposure. The resulting overall sensitivity of the visual setting experienced from KOP 2 is moderate.

KOP 3 – Ethanac Road near Tyler Avenue

KOP 3 is located on the eastbound shoulder of Ethanac Road near the intersection with Tyler Avenue, approximately 0.4 mile northwest of the project site. This viewpoint was selected to represent views toward the proposed project site available to residents along this portion of Ethanac Road and eastbound travelers on Ethanac Road. Ethanac Road defines the southern edge of the community of Romoland. This viewpoint is also somewhat representative of southeasterly views from Tyler, Harrison, and Van Buren Avenues. **VISUAL RESOURCES Figure 13A** shows the view from KOP 3 to the southeast toward the proposed project site.

Visual Quality

The foreground to middleground agricultural landscape is flat and generally nondescript. The most prominent features are the open field in the immediate foreground, the heavy equipment storage area, wood pole line and 500 kV transmission line in the distant foreground and middleground, and the rocky hills and distant mountains in the background. Although KOP 3 does provide open, panoramic views of a primarily rural landscape, none of the apparent landscape features contribute substantial visual variety or interest and overall visual quality is low-to-moderate.

Viewer Concern

Since Ethanac Road primarily serves local traffic, most motorists and adjacent residents would be sufficiently familiar with local conditions to anticipate a foreground to middleground suburban and rural agricultural landscape with some industrial and energy transmission infrastructure presence. However, viewers' expectations would also include generally open, panoramic vistas across the flat fields to the rocky hills and mountains to the east and south. Any additional blockage of views or introduction of features with industrial character would be perceived as an adverse visual change and viewer concern is moderate-to-high.

Viewer Exposure

The view of the site from KOP 3 is relatively unobstructed with the exception of the minimal low lying screening provided by the construction vehicle storage facility. Also, the views from some of the residential properties are partially screened by outbuildings, fences, and plantings on the residential properties and by similar features on intervening

properties. The resulting site visibility is moderate at this foreground viewing distance. The number of residential viewers is low (less than a dozen residences with views toward the site) while the number of travelers on Ethanac Road with views of the site is moderate (average daily traffic on Ethanac Road is 3,855 vehicles [Calpine 2001a, Figure 5.11-2]). The duration of view is moderate (for travelers) to extended (for residents). Overall viewer exposure is moderate for travelers and moderate-to-high for residents.

Overall Visual Sensitivity

For travelers on Ethanac Road and nearby residents, the low-to-moderate visual quality somewhat tempers the moderate-to-high viewer concern. Combined with a moderate viewer exposure, the resulting overall visual sensitivity to visible landscape change as experienced from KOP 3 is moderate.

KOP 4 – Spring Winds Drive at North Winds Drive

KOP 4 is located on Spring Winds Drive, just east of North Winds Drive in the Trade Winds mobile home subdivision. This viewpoint is located north of SR-74 and due north of the proposed project site at a distance of approximately 0.23 mile. It was selected to represent views toward the project site from this 90-unit mobile home subdivision which is the nearest residential development to the project site. KOP 4 represents the view that would be available to the approximately 10 residences that would front the north and south sides of Spring Winds Drive (Calpine 2001a, p. 5.10-9). **VISUAL RESOURCES Figure 14A** shows the view from KOP 4 to the south toward the proposed project site.

Visual Quality

The major elements in this somewhat constrained view are the residences and fenced yards in the immediate foreground, the utility infrastructure and the asphalt plant in the distant foreground, and the transmission line and rocky hills in the background. However, views of the site from the foreground residences would be somewhat less obstructed, primarily encompassing the asphalt plant, transmission and utility infrastructure, and the rocky hills to the south. The visual quality of this transitional rural-to-suburban and partially industrial landscape is low-to-moderate.

Viewer Concern

Residents in the vicinity of KOP 4 anticipate a foreground to middleground transitional rural to suburban industrial landscape dominated by the existing asphalt plant and nearby transmission and utility infrastructure. However, the introduction of additional energy infrastructure with prominent geometric forms and complex industrial character, accompanied by additional view blockage of the hills and mountains to the south and southeast would be perceived as an adverse visual change that would further diminish the quality of views from their residences. Overall viewer concern is moderate-to-high.

Viewer Exposure

Site visibility is moderate in that the view of the site from KOP 4 is partially obstructed at a foreground viewing distance of approximately 0.23 mile. The number of residential

viewers is low though the duration of view would be extended. The resulting overall viewer exposure is moderate.

Overall Visual Sensitivity

For residents in the vicinity of KOP 4, the low-to-moderate visual quality somewhat tempers the moderate-to-high viewer concern which, when combined with a moderate viewer exposure, results in an overall moderate visual sensitivity.

KOP 5 – SR-74 at the Post Office Parking Lot Exit

KOP 5 is located on westbound SR-74 at the post office parking lot exit, approximately 0.25 mile northeast of the proposed site's northeastern corner. This viewpoint was selected to represent views toward the project site from the adjacent shopping area, which because of the presence of the post office, is an important community activity center. This KOP is also intended to be representative of the views experienced by westbound travelers on SR-74, though it is slightly outside of the primary cone of vision (45° either side of the primary direction of travel) of westbound motorists. SR-74 is the primary east-west thoroughfare through the Perris Valley and has a two-way average daily traffic (ADT) level of 20,000 vehicles per day (Calpine 2001a, p. 5.10-10). SR-74 has also been designated eligible for State Scenic Highway status. **VISUAL RESOURCES Figure 15A** shows the view from KOP 5 to the southwest toward the proposed project site.

Visual Quality

From this viewpoint, the most prominent features in the existing landscape are the flat open fields that occupy the foreground, the existing electric transmission and utility infrastructure, SR-74, and the rounded, monotone rocky hills that extend from the middleground to background. Located on the fringe of suburban development, this transitional rural to suburban landscape generally lacks features of intrinsic beauty or visual interest and overall visual quality is low-to-moderate.

Viewer Concern

Visitors to the post office/commercial strip and motorists on SR-74 anticipate views of the suburban fringe landscape south of SR-74 with the noticeable presence of energy transmission infrastructure. However, an increase in industrial character or additional blockage of views of the surrounding hills would be perceived as an adverse visual change. Therefore, viewer concern is moderate-to-high.

Viewer Exposure

Site visibility from KOP 5 is high in that the view of the site is open and unobstructed at a foreground viewing distance of approximately 0.25 mile. From other portions of SR-74, views toward the project site are partially obscured by commercial and industrial uses and billboards located along the south side of the highway. The number of viewers at the shopping center and post office is estimated to be moderate-to-high, while the number of travelers on SR-74 with views of the proposed project site is high (average daily traffic on SR-74 is approximately 20,000 vehicles covering both directions of travel). The duration of view would be moderate and overall viewer exposure is moderate-to-high for visitors to the shopping center and high for travelers on SR-74.

Overall Visual Sensitivity

For visitors to the post office/commercial strip and motorists on SR-74, the low-to-moderate visual quality partially tempers the moderate-to-high viewer concern and viewer exposure. The resulting overall sensitivity of the visual setting experienced from KOP 5 is moderate for visitors to the shopping center.

For travelers on SR-74, the low-to-moderate visual quality partially offsets the moderate-to-high viewer concern and high viewer exposure. The resulting overall sensitivity of the visual setting would be moderate-to-high for travelers on SR-74.

KOP 6 – Menifee Road (Gas Compressor Site)

KOP 6 is located on Menifee Road, just north of Rouse Road and approximately 0.12 mile east of the proposed gas compressor site. This viewpoint was selected to represent the views from two nearby residences and the views that would be experienced by motorists on Menifee Road, which has been designated an Eligible County Scenic Highway. **VISUAL RESOURCES Figure 16A** shows the view from KOP 6 to the west toward the gas compressor site.

Visual Quality

Views from this KOP encompass a rural agricultural panorama comprised of foreground to middleground open fields, punctuated by electric transmission infrastructure and trees forming a windrow adjacent to residential and agricultural structures. Also present is additional utility infrastructure along Menifee Road (out of the frame of the picture in Figure 16A). Rounded, rocky hills form a backdrop in the distant middleground while more distant mountains are faintly visible in the background. Visual quality of this rural agricultural landscape is low-to-moderate, reflecting the general absence of distinguishing visual features and the substantial influence of industrial character imparted by the existing electric transmission and utility infrastructure that parallels Menifee Road as it converges on Valley Substation.

Viewer Concern

Nearby residents and motorists on Menifee Road anticipate a foreground to middleground agricultural landscape with some industrial presence in form of energy transmission and utility infrastructure, and industrial buildings to the north of the compressor station site. However, any increase in industrial character or additional blockage of views of surrounding hills would be perceived as an adverse visual change. Overall viewer concern is moderate-to-high.

Viewer Exposure

Visibility of the compressor site from KOP 6 on Menifee Road and two nearby residences is high in that the view of the site is open and unobstructed at a foreground viewing distance of approximately 0.12 mile. The number of residential viewers would be very low and the number of travelers on Menifee Road would be moderate (average daily traffic is 6,184 vehicles per day [Calpine 2001a, Figure 5.11-2]). The duration of view would be moderate for travelers and extended for residents. Overall viewer exposure is moderate-to-high for both residents and travelers.

Overall Visual Sensitivity

For nearby residents and travelers on Menifee Road, the low-to-moderate visual quality partially offsets the moderate-to-high viewer concern and viewer exposure. The resulting overall sensitivity of the visual setting experienced from KOP 6 is moderate for both residents and travelers.

IMPACTS

CONSTRUCTION IMPACTS

Construction of the proposed power plant and linear facilities would cause temporary adverse visual impacts due to the presence of equipment, materials, and workforce. Construction would involve the use of cranes, heavy construction equipment, temporary storage and office facilities, and temporary laydown/staging areas. Construction would include site clearing and grading, ditching for construction of underground linear facilities, construction of the actual facilities, and site and rights-of-way cleanup and restoration.

Views of the laydown areas from the north and northwest would be partially screened by the large heavy equipment storage yard located on the west side of Antelope Road. Views of the laydown area from the east and northeast would be partially screened by the piles of recycled asphalt located south of Matthews Road. To provide further screening of views of the laydown area, particularly from the south, at the beginning of the construction period, the Applicant has committed to placing a temporary screening fence around the western, southern, and eastern boundaries of the southern laydown area, and along the eastern boundary of the northern laydown area (Calpine 2001a, p. 5.10-23).

The proposed project construction would occur over a 25-month period. Due to the relatively short-term nature of project construction, the adverse visual impacts that would occur during construction would not be significant. However, this conclusion assumes that complete restoration of construction areas and rights-of-way is accomplished. Proper implementation of Condition of Certification **VIS-1** would ensure that the visual impacts associated with project construction remain less than significant. Also, while the majority of construction activities would occur during daylight hours, some of the construction activity would take place at night (FWEC 2002c, p. 98, Response To Data Request #147). In order to ensure that significant construction lighting impacts do not occur, staff has recommended Condition of Certification **VIS-4**, presented later in this analysis.

Construction of the gas and wastewater pipelines would involve the temporary disruption of the area along the rights-of-way by machinery, excavated piles of soil, construction vehicles, and other disturbances associated with pipeline construction. The gas pipeline would involve open cut trench excavation in the rights-of-way of Junipero, Matthews, McLaughlin, Menifee, and San Jacinto Roads. For most of its route, the wastewater pipeline would entail open cut trench excavation. In the area

where the pipeline will cross under I-215, boring and jacking operations would be required.

For open trench pipeline installation, the construction contractor would be limited to 500 feet of open trench at anytime in accordance with County of Riverside Transportation Department Encroachment Permit Requirements. Typically from 250-300 feet of pipeline would be installed daily as the project proceeds along the stipulated alignment. All work would be confined to the public right of way and the construction equipment would be removed from the pipeline route at the end of each workday, and returned to the contractor's equipment yard.

It is estimated that construction of the wastewater pipeline would take approximately four months to complete. Along any portion of the pipeline where active construction is taking place, trenching and installation of piping is expected to be completed within a week, and final repaving of the street would be completed within a month (FWEC 2002c, p. 95).

The portion of the wastewater pipeline route with the greatest potential sensitivity to construction impacts is the area depicted in **VISUAL RESOURCES Figure 4** (Photo 3), the 1.6-mile section of Murrieta Road in the central portion of Sun City, where in many areas, single family homes front on both sides of the street. Because of the orientation of the homes to the street, the relatively small setbacks, and the limited amount of screening vegetation in the front yards, the construction activities would be highly visible to the residents in this area. However, because of the relatively short length of time that the construction activity would be evident along any specific segment of the route in this area, the resulting visual impacts would be adverse but not significant.

In the other areas along the wastewater pipeline and gas pipeline rights-of-way, there are few or no residences that view directly onto the rights-of-way where pipeline construction would take place. Even with the limited residential viewing opportunities, because of the relatively short length of time that the construction activity would be evident along any specific segment of the route in these areas, the resulting visual impacts would be adverse but not significant.

The visual impacts of the pipeline's construction on views from I-215 would be limited and less than significant because of the brief period of time during which construction activities would be visible from I-215.

OPERATION IMPACTS

An analysis of operation impacts was conducted for the view areas represented by the key viewpoints selected for in-depth visual analysis. The results of the operation impact analysis are discussed below by KOP and presented in the Visual Analysis Summary table included as **Visual Resources Appendix VR-1**. The visual impacts of vapor plume formation and night lighting are discussed in separate sections of this analysis. For each KOP, an evaluation of visual contrast, project dominance, and view blockage is presented with a concluding assessment of the overall degree of visual change caused by the proposed project.

Impacts of Power Plant Structures [Including Transmission Line]

The proposed project would result in the introduction of sizable geometric structures with industrial character into a rural-suburban transitional landscape. The most prominent project structures would be the two 195-foot tall HRSG stacks, the 108-foot tall HRSG structures, the 65-foot tall air inlet filters to the combustion turbine generators (CTGs), the 55-foot tall steam turbine generator, the 80-foot tall auxiliary boiler stack, the 100-foot tall transmission line take-off structure, and the 59-foot tall, 840-foot long cooling tower structure consisting of 14 cells.

The 0.9-mile 500 kV electric transmission interconnection would also be visible in the immediate power plant vicinity. The transmission interconnection would parallel, and appear similar to, an existing SCE 500 kV transmission line between the project site and Valley Substation located east of the project site. The proposed interconnection would have approximately eight towers with a maximum height of 162 feet.

The proposed switchyard, located immediately east of the power generation facilities, would be most noticeable in the view from KOP 4 (SR-74). The switchyard would appear of similar scale and industrial character to the proposed power generation facilities. The gas compressor station would be visible from Rouse Street and Menifee Road (KOP 6) and would appear similar in industrial character though substantially smaller in scale compared to the proposed power generation facilities.

KOP 1 – Dawson Road at Almaden Lane

VISUAL RESOURCES Figure 11B presents a visual simulation of the proposed project as viewed from KOP 1 at the intersection of Dawson Road and Almaden Lane. The most obvious change to the landscape would be the introduction of prominent geometric forms with horizontal and vertical lines and complex industrial character. The resulting structural mass would be substantially greater than that of other built structures in the landscape.

Visual Contrast

The proposed project would introduce the prominent geometric forms and vertical and horizontal lines of the HRSG structures and stacks. The project would also introduce the noticeable horizontal, rectilinear form of the 14-cell cooling tower structure though at this distant foreground viewing distance, the cooling tower somewhat blends with the background hills. These structural characteristics would not be consistent with the existing forms and lines established by existing land and vegetative forms or the nearby electric transmission infrastructure. The neutral gray color of the proposed facilities would be consistent with the color of the existing asphalt plant and electric transmission towers and blends somewhat (though less effectively) with the rocky hills in the background. While the scale of these introduced forms and structural masses would be substantially larger than other developed features in the immediate project vicinity, they would appear smaller to similar in scale compared to the foreground and background landforms, respectively. The resulting visual contrast would be moderate-to-high at this distant foreground viewing distance (see the Visual Analysis Summary table presented as **Visual Resources Appendix VR-1**).

Project Dominance

The rural-suburban transitional landscape visible from KOP 1 is dominated by the flat, horizontal form of the foreground fields, the prominent vertical forms of electric transmission line structures, and the low horizontal form of the Lakeview Mountains in the background. The proposed power plant facilities would appear spatially prominent in the center of the view and the extension of the vertical HRSG stacks above the horizon line established by the mountain range in the background would contribute to the project's structural prominence. However, the project structures would appear subordinate-to-co-dominant compared to the broad foreground landform of the valley floor and co-dominant compared to the existing 500 kV electric transmission line structures and background Lakeview Mountains. Overall, project dominance would be co-dominant.

View Blockage

From KOP 1 the vertical HRSG structures and stacks and horizontal 14-cell cooling tower structure (lower quality landscape features) would block from view portions of sky and lower elevations of the Lakeview Mountains (higher quality landscape features), which are prominently visible to the northeast and east of the project site. However, the majority of the mountain range is still visible above most of the project structures and the continuity of the ridgeline remains intact except where interrupted by the HRSG and stack. The resulting view blockage would be moderate-to-high.

Overall Visual Change

From KOP 1, the overall visual change caused by the proposed project would be moderate-to-high due to the moderate-to-high degree of contrast and view blockage that would occur from the project's co-dominant structures.

Visual Impact Significance

When considered within the context of the overall moderate visual sensitivity of the existing landscape and viewing characteristics, the moderate-to-high visual change that would be perceived from KOP 1 would cause an adverse and significant visual impact.

KOP 2 – Dawson Road at McLaughlin Road

VISUAL RESOURCES Figure 12B presents a visual simulation of the proposed project as viewed from KOP 2 at the intersection of Dawson and McLaughlin Roads. The most obvious change to the landscape would be the introduction of prominent geometric forms with horizontal to vertical lines and complex industrial character. The resulting structural mass would be substantially greater than that of other built structures in the immediate project vicinity.

Visual Contrast

The proposed project would introduce the prominent geometric forms and vertical and horizontal lines of the HRSG structures and stacks. The project would also introduce the prominent horizontal, rectilinear form of the 14-cell cooling tower structure which, at this foreground viewing distance, stands out from the background Lakeview Mountains (unlike the view from KOP 1). These structural characteristics would not be consistent with the existing forms and lines established by existing land and vegetative forms or

the nearby electric transmission infrastructure. The neutral gray color of the proposed facilities would be consistent with the color of the existing asphalt plant and electric transmission towers, though at this foreground viewing distance is less subtle than it appears from the more distant KOP 1 and more contrasting with the rocky hills in the background. Also, the scale of these introduced forms and structural masses would be substantially larger than other developed features in the immediate project vicinity and similar in scale to the surrounding landforms. The resulting visual contrast would be high at this foreground viewing distance (see the Visual Analysis Summary table presented as **Visual Resources Appendix VR-1**).

Project Dominance

The rural-suburban transitional landscape visible from KOP 2 is dominated by the flat, horizontal form of the foreground fields and the low horizontal form of the Lakeview Mountains in the background. The proposed power plant facilities would appear large and spatially prominent in the center of the view and the extension of the vertical HRSG stacks and cooling tower above the horizon line established by the mountain range in the background substantially increases the project's structural prominence. From this foreground viewing distance, the project structures would dominate the background mountain landform and appear co-dominant with the foreground valley landform. Overall project dominance would be co-dominant-to-dominant.

View Blockage

From KOP 2 the vertical HRSG structures and stacks and horizontal 14-cell cooling tower structure (lower quality landscape features) would block from view portions of sky and a substantial portion of the Lakeview Mountains (higher quality landscape features). Unlike the view from KOP 1, the continuity of the background mountain ridgeline is substantially compromised by complete blockages of the ridgeline behind the HRSG structures and stacks and cooling tower. The resulting view blockage would be high.

Overall Visual Change

From KOP 2, the overall visual change caused by the proposed project would be high due to the high degree of contrast and view blockage that would occur from the project's visually co-dominant-to-dominant structures.

Visual Impact Significance

When considered within the context of the overall moderate visual sensitivity of the existing landscape and viewing characteristics, the high degree of visual change that would be perceived from KOP 2 would cause an adverse and significant visual impact.

KOP 3 – Ethanac Road Near Tyler Avenue

VISUAL RESOURCES Figure 13B presents a visual simulation of the proposed project as viewed from KOP 3 on Ethanac Road near Tyler Avenue. The most obvious change to the landscape would be the introduction of prominent geometric forms with horizontal to vertical lines and complex industrial character. The resulting structural mass would be substantially greater than that of other built structures in the landscape.

Visual Contrast

The proposed project would introduce the prominent geometric forms and vertical and horizontal lines of the HRSG structures and stacks. The project would also introduce the noticeable horizontal, rectilinear form of the 14-cell cooling tower structure, though at this distant foreground viewing distance, the cooling is lower on the horizon and less prominent than it appears from KOP 2. Also, the complexity of the cooling tower structure is less than it might otherwise appear because of the structural complexity of the numerous construction vehicles in the storage yard that is visible in front and to the west of the cooling tower. While the project's structural characteristics would not be consistent with the existing forms and lines established by existing land and vegetative forms and the nearby electric transmission infrastructure, there would be some similarities to the vertical wood pole line in the foreground and the repeated forms of stored vehicles adjacent to the site. The neutral gray color of the proposed facilities would be consistent with the color of the existing asphalt plant and electric transmission towers, though the color would blend less effectively with the more bluish tone of the sky and distant mountains in the background. While the scale of these introduced forms and structural masses would be larger than other developed features in the immediate project vicinity, they would appear smaller to similar in scale compared to the foreground and background landforms, respectively. The resulting visual contrast would be moderate-to-high at this distant foreground viewing distance (see the Visual Analysis Summary table presented as **Visual Resources Appendix VR-1**).

Project Dominance

The rural-suburban transitional landscape visible from KOP 3 is dominated by the flat, horizontal form of the foreground fields. The proposed power plant facilities would appear spatially prominent in the view from KOP 3 and the extension of the vertical HRSG stacks above the horizon line established by the hills and mountain range in the background would contribute to the project's structural prominence. However, the structures would appear subordinate-to-co-dominant compared to the broad foreground landform of the valley floor and co-dominant compared to the background hills and mountains. Overall, from this distant foreground viewpoint, project dominance would be co-dominant.

View Blockage

From KOP 3 the vertical HRSG structures and stacks and horizontal 14-cell cooling tower structure (lower quality landscape features) would block from view portions of sky, hills and mountains in the background (higher quality landscape features). However, unlike KOPs 1 and 2, most of the landform features that would be blocked from view are more distant, lower on the horizon, and more obscured by haze. The resulting moderate view blockage would be less severe than for KOPs 1 and 2.

Overall Visual Change

From KOP 3, the overall visual change caused by the proposed project would be moderate due to the moderate degree of contrast and view blockage that would occur from the project's co-dominant structures.

Visual Impact Significance

When considered within the context of the overall moderate visual sensitivity of the existing landscape and viewing characteristics, the moderate visual change that would be perceived from KOP 3 would cause an adverse but not significant visual impact.

KOP 4 – Spring Winds Drive at North Winds Drive

VISUAL RESOURCES Figure 14B presents a visual simulation of the proposed project as viewed from KOP 4 at the intersection of Spring Winds Drive and North Winds Drive. The proposed project would result in the addition of prominent geometric forms with horizontal to vertical lines and complex industrial character. The resulting structural mass would be substantially greater than that of other built structures in the landscape south of SR-74.

Visual Contrast

The proposed project would introduce the geometric forms and vertical and horizontal lines of the HRSG structures and stacks. These structural characteristics share some similarities with other structural elements in the landscape including the existing asphalt plant and electric transmission and utility infrastructure along SR-74 and in the SCE corridor. The neutral color of the proposed facilities would be consistent with the color of the existing asphalt plant and electric transmission towers, though the scale of these introduced forms and structural masses would appear larger than other developed features in the immediate project vicinity. The resulting visual contrast would be moderate-to-high at this foreground viewing distance (see the Visual Analysis Summary table presented as **Visual Resources Appendix VR-1**).

Project Dominance

The proposed power plant facilities would appear large and spatially prominent in the view from KOP 4. Furthermore, the height of the vertical HRSG stacks and their extension above the horizon line established by the hills to the south would contribute to the project's structural prominence. While the project structures would appear dominant to the slender vertical forms of the foreground utility poles and the shorter asphalt plant, the structures would appear similar in scale to the foreground residential structures. Overall, the proposed project would appear co-dominant-to-dominant in relation to the existing landscape features.

View Blockage

From KOP 4 the proposed project structures (lower quality landscape features) would block from view portions of sky and background hills (higher quality landscape features). However, the amount of landscape blocked from view is smaller and less conspicuous than the landscape blocked from other vantagepoints such as KOP 2. Also, the landscape is already partially blocked by the intervening utility poles, electric transmission towers and conductors, and asphalt plant facilities. Therefore, the view blockage caused by the proposed project would be moderate-to-high.

Overall Visual Change

From KOP 4, the overall visual change caused by the proposed project would be moderate-to-high due to the moderate-to-high degree of contrast and view blockage that would result from the project's co-dominant-to-dominant structures.

Visual Impact Significance

When considered within the context of the overall moderate visual sensitivity of the existing landscape and viewing characteristics, the moderate-to-high visual change that would be perceived from KOP 4 would cause an adverse and significant visual impact.

KOP 5 –SR-74 at the Post Office Parking Lot Exit

VISUAL RESOURCES Figure 15B presents a visual simulation of the proposed project as viewed from KOP 5 at the exit from the post office/commercial strip on the north side of SR-74. The most obvious change to the landscape would be the introduction of prominent geometric forms with horizontal to vertical lines and complex industrial character. The resulting structural mass would be substantially greater than that of other built structures in the immediate project vicinity.

Visual Contrast

The proposed project would introduce the prominent geometric forms and vertical and horizontal lines of the HRSG structures and stacks. The project would also introduce the complex facilities that make up the switchyard. The 14-cell cooling tower, positioned behind the switchyard in this view, adds apparent mass to the otherwise more transparent spacing of the switchyard facilities. These structural characteristics would not be consistent with the existing forms and lines established by either existing land and vegetative forms or the nearby electric transmission infrastructure. The neutral gray color of the proposed facilities would be consistent with the color of the existing asphalt plant and electric transmission towers, though the scale of these introduced forms and structural masses would be substantially larger than other developed features in the immediate project vicinity. The resulting visual contrast would be high at this foreground viewing distance (see the Visual Analysis Summary table presented as **Visual Resources Appendix VR-1**).

Project Dominance

The rural-suburban transitional landscape visible from KOP 5 is dominated by the linear form of SR-74, the flat, horizontal form of the foreground fields, and the low rounded to irregular forms of the rocky hills in the background. The proposed power plant facilities would appear large and spatially prominent in the center of the view and the extension of the HRSG structures and stacks, cooling tower, and switchyard above the horizon line established by the hills in the background increases the project's structural prominence. From this foreground viewing distance, the project structures would dominate the background hill and mountain landforms and appear co-dominant with the foreground valley landform and SR-74 roadway. Overall project dominance would be co-dominant-to-dominant.

View Blockage

From KOP 5 the vertical HRSG structures and stacks, horizontal switchyard, and 14-cell cooling tower structure (lower quality landscape features) would block portions of sky and the distant hills in the background (higher quality landscape features). However, the distant mountain landforms are partially obscured by haze and as a result are less prominent in the landscape. The view blockage of these features is less significant than it would otherwise be if these landforms were more visible. The resulting view blockage caused by the proposed project would be moderate-to-high.

Overall Visual Change

From KOP 5, the overall visual change caused by the proposed project would be moderate-to-high due to the high degree of contrast and moderate-to-high degree of view blockage that would occur from the project's visually co-dominant-to-dominant structures.

Visual Impact Significance

When considered within the context of the overall moderate (visitors to the shopping center) to moderate-to-high (travelers on SR-74) visual sensitivity of the existing landscape and viewing characteristics, the moderate-to-high degree of visual change that would be perceived from KOP 5 would cause an adverse and significant visual impact.

KOP 6 – Menifee Road (Gas Compressor Station)

VISUAL RESOURCES Figure 16B presents a visual simulation of the proposed gas compressor station as viewed from KOP 6 on Menifee Road. The most apparent change to the landscape would be the introduction of geometric forms with horizontal and vertical lines and complex industrial character. The resulting structural mass would be substantially greater than that of the adjacent agricultural facilities in the landscape.

Visual Contrast

The proposed project would introduce the noticeable geometric forms and horizontal and vertical lines of the gas compressor facilities. These structural characteristics would not be consistent with the existing forms and lines established by existing land and vegetative forms or the nearby agricultural structures and residences. However, the station's vertical lines would be consistent with the existing adjacent electric distribution line. Also, the gray color of the structures causes them to blend effectively with the neutral tones of the background hills. While the scale of these introduced forms and structural masses would be greater than the existing agricultural facilities, they would appear shorter than the adjacent electric distribution line and substantially smaller than the surrounding landforms. The resulting visual contrast would be moderate (see the Visual Analysis Summary table presented as **Visual Resources Appendix VR-1**).

Project Dominance

The predominantly rural landscape visible from KOP 6 is dominated by the flat, horizontal form of the foreground fields, and the prominent rounded forms of the hills in the background. The proposed power plant facilities would appear smaller relative to the existing landforms though spatially prominent in the center of the view of this

exposed site. As a result, the proposed gas compressor station would appear subordinate-to-co-dominant with the existing foreground and background landforms.

View Blockage

From KOP 6 the gas compressor facilities (lower quality landscape features) would block from view portions of the alluvial fans at the base of the rocky hills in the background. From other vantage points along Menifee Road, the proposed project structures would also block from view small portions of the lower elevations of the background hills (higher quality landscape features). However, the compressor station's relatively low profile would not block the majority of the rounded forms that comprise the background to the west. The resulting view blockage would be moderate.

Overall Visual Change

From KOP 6, the overall visual change caused by the proposed project would be moderate due to the moderate degree of contrast and view blockage that would occur from the project's subordinate-to-co-dominant structures.

Visual Impact Significance

When considered within the context of the overall moderate visual sensitivity of the existing landscape and viewing characteristics, the moderate visual change that would be perceived from KOP 6 would cause an adverse but not significant visual impact.

Linear facilities

The proposed transmission line is evaluated above with the power plant structures. The proposed underground natural gas supply line would not be visible following installation except for an occasional warning marker and would not result in adverse visual impacts. Similarly, the 4.7-mile long underground wastewater pipeline would be located within existing rights of way and would not result in significant visual impacts. The proposed underground water supply pipeline would extend the short distance between the project site and the existing wastewater pipeline located within McLaughlin Road and would not result in significant visual impacts.

Lighting

At present, there are no structures and no lights located on the project site. The site is illuminated to a small degree by the moderate level of ambient lighting created by light from nearby sources including several large spotlights mounted on the concrete batch structure at the construction materials facility located immediately north of the project site. In views toward the project site from the south, a line of lights can be seen in the corridor that runs along SR-74. In addition, a number of the industrial facilities that lie to the northeast of the site have a moderately high level of exterior illumination that makes the walls of these buildings visible in distant views (FWEC 2002c, p. 96).

The proposed project would require nighttime lighting for operational safety and security though the project would not be required to have FAA-style red, flashing warning lights on the HRSG stacks (FWEC 2002c, p. 98). Exterior lights would be hooded and directed onsite and fixtures would be of a non-glare type. Areas where lighting is not required for normal operation, safety, or security would be provided with switched

lighting circuits or motion detectors, allowing these areas to remain unilluminated at most times (Calpine 2001a, AFC p. 5.10-15).

Project night lighting would be visible from all of the KOPs and their represented areas. Given the overall, relatively low level of existing lighting on the power plant site, gas compressor station site, and project vicinity, the proposed project lighting has the potential to change the character of the existing landscape at night both during construction and operation of the project, resulting in significant visual impacts. Even shielded lighting elements could create significant light and glare impacts as a result of indirect lighting of project structures and backscatter if not properly managed.

Visible Plumes

Staff conducted an independent modeling analysis of project vapor plumes associated with the proposed cooling tower, heat recovery steam generators (HRSGs), and auxiliary boiler exhaust stacks (Walters and Blewitt 2002). In order to model the cooling tower and HRSG plumes, staff used the following information provided by the Applicant: (a) Applicant's AFC (CALPINE 2001a, AFC Section 5.10.2.3), (b) Visual Attachment I (FWEC 2002c), and (c) Data Response Set 4, responses to requests numbered 180-181 and 182-184 (FWEC 2002e). As shown in **Table 2,** plume formation frequencies would exceed 10 percent or more of the seasonal daylight no fog no rain hours for both the HRSG and cooling tower plumes. A 10 percent or greater frequency of plume occurrence is a threshold established by staff at or beyond which, staff considers plumes to be sufficiently frequent that significant visual impacts may occur and additional plume dimension analysis is warranted.

With duct firing from noon to 10 PM, the unabated HRSG plume would occur 22.8 percent of all hours and 15.6 percent of seasonal daylight no rain no fog hours (seasonal daylight hours are those daylight hours during the months of November through April, when conditions conducive to plume formation are most prevalent). The unabated cooling tower plume would occur approximately 25.7 percent of all hours and 15.2 percent of all seasonal daylight no rain no fog hours. The auxiliary boiler plume would occur approximately 16.3 percent of all hours and 9.96 percent of all seasonal daylight no rain no fog hours.

The HRSG and cooling tower modeling results reflect the applicant's assertion that duct firing will normally occur between the hours of noon and 10 PM. The cooling tower and HRSG plume frequencies would be higher if duct firing were to occur beyond those hours and lower if duct firing were to occur fewer hours than indicated.

Table 2
Staff Predicted Hours with Visible Plumes
March Air Force Base 1997 to 2001 Meteorological Data

Measurement Period	Available Hours	Unabated HRSG Limited Duct Firing (Noon to 10 PM)		Cooling Tower Limited Duct Firing (Noon to 10 PM)		Auxiliary Boiler	
		Total (Hrs)	Percent	Total (Hrs)	Percent	Total (Hrs)	Percent
All Hours	42,385	9,680	22.8%	12,501	29.5%	6,905	16.3%
Daylight Hours	21,452	2,661	12.4%	3,539	16.5%	1,970	9.18%
Seasonal Daylight No Rain No Fog Hours	8,291	1,295	15.6%	1,262	15.2%	826	9.96%

Table 3 provides the plume dimensions for the 10 percent frequency plume during all hours and seasonal daylight no rain no fog hours. The two HRSG stacks would be located adjacent to each other, which would create a single larger plume. Therefore, the HRSG results provided in Table 3 are for a theoretical combined stack. As shown in Table 3, the resulting vapor plumes from both the cooling tower and HRSG stacks would be large relative to the heights of the proposed structures. The HRSG plumes would be over twice the height of the 195-foot tall HRSG stacks (the tallest project structures) while the cooling tower plumes would be slightly less than twice the height of the HRSG stacks.

Plumes of this magnitude would be visually prominent when viewed in the context of the Perris Valley. The valley is ringed by rocky hills and mountain ranges and the valley bottom is relatively flat with substantial undeveloped areas. As a result, cross-valley sightlines to both close and distant hills and ridgelines are available throughout the valley. The plumes would cause view blockages of the surrounding hills, mountain ranges, ridgelines and Mount San Jacinto. Given the absence of other plumes in the valley and the broad visibility of the plume from close and distant vantagepoints including residences and roadways, the relatively high frequency and substantial sizes of visible plumes that would occur at the project site could cause a noticeable and persistent change in the landscape character depending on meteorological conditions and visibility. Staff is in the process of obtaining additional information necessary to prepare simulations of project vapor plumes. Once the vapor plume simulations are complete, more detailed analyses of vapor plume visual impacts will be conducted. Therefore, staff is unable to determine plume impact significance at this time.

Table 3
10th Percentile Visible Plume Dimensions – CSVP Model Results
March Air Force Base 1997 – 2001 Meteorological Data

Measurement Period And Parameter	Unabated HRSG With Duct Firing Noon to 10 PM (Combined Stack)	Unabated Cooling Tower
All Hours		
Height (ft)	646	404
Length (ft)	577	1,549
Width (ft)	115	279
Seasonal Daylight No Rain No Fog Hours		
Height (ft)	436	361
Length (ft)	299	653
Width (ft)	89	194
HRSG data is for each of three separate HRSG exhaust plumes		

CONSIDERATION OF IMPACTS IN RELATION TO CEQA SIGNIFICANCE CRITERIA

This analysis considered the potential impacts of the proposed project in relation to the four significance criteria for visual resource impacts listed in Appendix G of the CEQA Guidelines, under Aesthetics, specified below.

1. Would the project have a substantial adverse effect on a scenic vista?

There are no scenic vistas in the project region so the proposed project would not result in significant visual impacts under this criterion.

2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Although the proposed structures are located within the viewsheds of a state eligible scenic highway (SR-74), a county designated Scenic Road Corridor (I-215), and a locally-designated scenic road (Menifee Road), they are not located within the viewshed of a state designated scenic highway nor would they damage the types of resources specified in this criterion. Therefore, project structures would not result in significant visual impacts under this criterion.

3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

As discussed in a previous section of this analysis, the proposed project would introduce prominent structures of industrial character into the foreground to middleground of views from nearby residences and roadways. The resulting visual change would range from low-to-moderate to high, depending on viewpoint location. Viewers on adjacent roads and at nearby residences would experience visual degradation and a significant visual impact under this criterion. Also, the proposed project's unabated vapor plumes would be prominent and persistent features in the views from local and regional roads and nearby residences. However, staff is in the

process of obtaining additional information necessary to complete the vapor plume impact analysis and is unable to determine the impact significance of visible vapor plumes at this time.

4. Would the project create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?

The project has the potential to create a new source of substantial light that would adversely affect nighttime views in the area and result in a significant visual impact under this criterion.

CUMULATIVE IMPACTS

Cumulative impacts to visual resources could occur where project facilities or activities (such as construction) occupy the same field of view as other built facilities or impacted landscapes. It is also possible that a cumulative impact could occur if a viewer's perception is that the general visual quality of an area is diminished by the proliferation of visible structures (or construction effects such as disturbed vegetation), even if the new structures are not within the same field of view as the existing structures. The significance of the cumulative impact would depend on the degree to which (1) the viewshed is altered; (2) visual access to scenic resources is impaired; (3) visual quality is diminished; or (4) the project's visual contrast is increased.

Table 4 lists the 10 approved projects in the project vicinity that have been identified for cumulative impact analysis. Four of the projects would not be visible in the proposed project's field of view. None of the remaining six projects would cause a significant cumulative visual impact, either individually in combination with the proposed project or in total (all projects). The fast food restaurant (#3) and the three-lot development (#8) would be relatively small projects and would be minimally noticeable in the same field of view as the proposed project. Phase 2 of the asphalt batch plant (#2), the heavy equipment storage yard (#4), and the contractor storage yard (#6) would be located adjacent to the proposed project site but would appear similar to existing adjacent uses. The visual change associated with these three projects would be minimally noticeable. Also, these three projects would be even less noticeable in the context of the more dominant structures and character of the proposed project. Project Nos. 2, 4, and 6 would have limited visibility to southbound travelers on I-215 due to the indirect angle of view toward these projects and the proposed project site. The batch plant addition (#2) would have limited visibility to northbound travelers on I-215 due to the partial screening that would be provided by the 137-lot subdivision (#9), the existing batch plant facilities, and vegetation. The heavy equipment and contractor storage yard projects (#'s 4 and 6) would be substantially screened from I-215 by the 137-lot subdivision project. The resulting cumulative impact associated with these three projects would be adverse but not significant.

The 137-lot subdivision that would be located near I-215 (#9) would be highly visible from I-215 and would be in the same field of view as that of the proposed project. This subdivision project in combination with the proposed project would contribute to the sense of "urbanization" that is occurring along the I-215 corridor. However, the residential subdivision would also partially screen views of the proposed project from I-

215, somewhat off-setting the cumulative visual impact of the two projects. Furthermore, given the viewing distance to the proposed project from I-215, the indirect angle of view toward the project from I-215, and the industrial landscape character caused by the existing asphalt batch plant and adjacent storage facilities, the proposed project would not cause significant visual impacts on views from I-215. Therefore, the cumulative visual impact of the proposed project, would be adverse but not significant.

Table 4
Cumulative Projects in the Project Vicinity

Project Number	Case Number	Description	Visible in Proposed Project Field of View	Cumulative Impact Significance
1	CUP02479	"Old Plan"	No	Not Significant
2	CUP03144S1	Phase 2 asphalt batch plant	Yes	Not Significant
3	CUP03293	Fast food restaurant	Yes	Not Significant
4	CUP03300	Heavy equipment storage yard / warehouse / offices	Yes	Not Significant
5	CUP03312	Four buildings to manufacture air pollution equipment	No	Not Significant
6	PP16208	Contractor storage yard with caretaker unit	Yes	Not Significant
7	PP17437	Class I dog kennel (10 dogs)	No	Not Significant
8	PM28094	Parcel Map to divide approximately five acres into three parcels	Yes	Not Significant
9	TR29113	Subdivide 29.7 acres into 137 single family residential lots 7,200 S.F. minimum	Yes	Not Significant
10	TT29495	Subdivide 87 acres into 348 lots	No	Not Significant

The Applicant conducted plume surveys in the project vicinity on two occasions and identified one existing plume source at the asphalt batch plant located directly north of and adjacent to the proposed project site. The plume was a water vapor plume from the venturi (water) scrubber on the asphalt plant stack. This plume persisted for approximately 150-250 feet downwind of the stack. The residual opacity of the stack upon water plume dissipation averaged 5-20 percent (FWEC 2002c, p. 99). However, at this time, staff does not have sufficient information regarding the frequency of the batch plant's plume occurrence to be able to asses the potential cumulative impact significance associated with the visibility of the batch plant plume and the proposed project plumes.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is less than fifty percent within a six-mile radius of the proposed project (please refer to **Socioeconomics Figure 1** in this Staff Analysis). However, as indicated in **Socioeconomics Figure 1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius; staff considers these to be pockets or clusters. Staff also reviewed Census 1990 information that shows the low-income population is less than fifty percent within the same radius. Because staff have determined there to be pockets or clusters of minority population within the six-mile radius, staff has conducted a focused environmental justice analysis for visual resources.

Based on the visual resources analysis, staff found that the proposed project would cause significant visual impacts. However, staff is proposing the Applicant's sixteen (16) mitigation measures and seven (7) conditions of certification that would reduce all presently identified significant visual impacts to levels that would not be significant. Condition of Certification VIS-1 requires the adequate mitigation of temporary construction impacts. Condition of Certification VIS-2 requires the color treatment of structures to minimize visual intrusion and contrast. Condition of Certification VIS-3 requires effective vegetative screening of project structures (it should be noted that staff is recommending a workshop to address the feasibility of Condition of Certification VIS-3). Conditions of Certification VIS-4 and VIS-5 require effective control of night lighting to minimize offsite visibility of night lighting. Condition of Certification VIS-6 requires compliance with the signage requirements of Riverside County. VIS-7 requires implementation of appropriate project design measures.

With effective implementation of staff's proposed mitigation measures and conditions of certification, the project would not cause significant visual impacts. Therefore, there are no visual resources environmental justice issues related to this project.

FACILITY 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 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. The closure plan that the project owner is required to prepare will address removal of the power plant structures.

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency. No special conditions regarding visual resources are expected to be required to address temporary closure.

Unexpected permanent 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. The contingency plan that the project owner is required to prepare will address removal of the power plant structures.

LOCAL

Ten local LORS were found to pertain to the enhancement and/or maintenance of visual quality and the protection of views. Table 5 provides a listing of the relevant local LORS from the Riverside County Comprehensive General Plan and the Menifee North Specific Plan. Based on staff's preliminary analysis, it appears that, following effective implementation of all 17 mitigation measures and eight (8) conditions of certification, the proposed project would be consistent with all ten of the local goals, objectives, policies, and ordinances referenced in Table 5.

Table 5
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before/After Mitigation/ Conditions	Basis for Consistency
Source	**Description of Principles, Objectives, and Policies**		
Riverside County Comprehensive General Plan			
Land Use Element	Goal No. 7: The retention as open space of those lands containing important natural resources, such as scenic beauty…	YES	The proposed project is not located within an area that has been identified as containing important resources of scenic beauty.
Utilities	Objective No. 3: The impacts of major transmission and distribution lines will be mitigated through the use of the established joint utility corridors and other appropriate measures to preserve scenic highways and other unique natural resources as well as lessen visual impacts in urban areas.	YES / YES	The proposed project's electric interconnection would be visible from SR-74 (state eligible scenic highway), I-215 (a County-designated scenic road corridor), and Menifee Road (a locally designated scenic road). However, the line would parallel an existing transmission line corridor from the project site to the nearby Valley Substation thereby avoiding the proliferation of transmission line corridors within the viewsheds of scenic roads, thereby minimizing the resulting visual impacts.

Table 5
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before/After Mitigation/ Conditions	Basis for Consistency
Source	**Description of Principles, Objectives, and Policies**		
Utilities Land Use Standards	Facility Siting – Aesthetics and Design: Where possible, facilities should be located where they will be naturally or artificially screened and/or designed so as to be congruous with the natural features of its site. The use of non-reflective materials, painting a natural color (excluding lattice steel towers), screening with naturally planted trees may also be used to screen lines. Aesthetically designed towers should be considered for locations where they would be environmentally compatible with the surroundings.	UNCERTAIN / YES	The proposed project would be partially screened by landscaping that would be placed around the project's perimeter. Structures would also be painted neutral gray and gray-taupe colors to blend with the existing environment. The transmission interconnection would be partially screened from views from the north by the landscaping proposed to be planted around the power plant perimeter. The transmission line would parallel an existing transmission line corridor from the project site to the nearby Valley Substation thereby avoiding the proliferation of transmission line corridors within the viewsheds of scenic roads and minimizing the resulting visual impacts. The proposed transmission line structures would be similar in size and design to the existing transmission line structures adjacent to the proposed project.
Riverside County Zoning Ordinance			
Ordinance 655	Ordinance 655 implements the light pollution policies of the Riverside County Comprehensive General Plan. Ordinance 655 also requires the use of low pressure sodium vapor lighting or overhead high pressure sodium vapor lighting with shields or cutoff luminares within the Mt. Palomar Special Lighting Area.	UNCERTAIN / YES	The Applicant is proposing that exterior lights be hooded and directed onsite and fixtures be of a non-glare type. Also, areas where lighting is not required for normal operation, safety, or security would be provided with switched lighting circuits or motion detectors, allowing these areas to remain unilluminated at most times. However, project night lighting would still be visible from all of the KOPs and their represented areas. Given the overall, relatively low level lighting on the power plant site, gas compressor station site, and project vicinity, the proposed project lighting has the potential to change the character of the existing landscape at night, resulting in significant visual impacts. Even shielded lighting elements could create significant light and glare impacts as a result of indirect lighting of project structures and backscatter if not properly managed. Staff's Conditions of Certification **VIS-4** and **VIS-5** require effective control of night lighting and would meet or exceed the requirements for night lighting management within the Mt. Palomar Special Lighting Area.
Sun City / Menifee Valley Community Plan			

Table 5
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before/After Mitigation/ Conditions	Basis for Consistency
Source	**Description of Principles, Objectives, and Policies**		
Community Goals	Goal: To retain as open space those lands containing important natural resources, such as scenic beauty…	YES / YES	The proposed project is not located within an area that has been identified as containing important resources of scenic beauty.
Visually Sensitive Road Corridors (applies to uses within 660 feet of the right of way)	Policy (a): Within [660 feet of] scenic road corridors, trees and other roadside landscaping shall be utilized to protect and enhance the view from the road.	UNCERTAIN / YES	The proposed power generation facilities include landscaping to screen the facilities from SR-74 (located 625 feet to the north of the site). The proposed gas compressor station to the west of Menifee Road includes landscaping to screen the facility from Menifee Road.
Visually Sensitive Road Corridors (applies to uses within 660 feet of the right of way)	Policy (b): The size, height, and type of on-site signs within scenic road corridors shall be the minimum necessary for identification. The design, materials, color, and location of the signs shall blend with the environment, utilizing natural materials where possible	YES / YES	The Applicant has committed to providing minimal signage and using non-glare materials and unobtrusive colors (also see staff's Condition of Certification **VIS-6**).
Visually Sensitive Road Corridors (applies to uses within 660 feet of the right of way)	Policy (d): The design and appearance of new land uses within scenic road corridors shall be compatible with the scenic setting or environment. All appurtenant equipment and storage areas shall be screened as needed to make them compatible with the scenic setting or environment.	UNCERTAIN / YES	The proposed gas compressor station to the west of Menifee Road includes landscaping to screen the facility from Menifee Road. Also, the Applicant has committed to the use of appropriate colors to visually integrate structures into their landscape backdrops (Calpine 2001a, AFC p. 5.10-26). Further, staff's Condition of Certification **VIS-2** requires the use of appropriate colors to visual integrate project structures into the existing landscape. Also, staff's Condition of Certification **VIS-3** requires effective landscape screening of proposed project structures.
Industrial and Manufacturing	Policy (b): Industrial development shall be compatible with adjacent land uses. Protective measures may include, but not be limited to, landscaping and design review procedures with respect to noise, dust, odors, vibration and glare.	UNCERTAIN / YES	The proposed project incorporates color treatment and the appropriate use of colors (see staff Condition of Certification **VIS-2**), landscape screening (see staff Condition of Certification **VIS-3**), and directional shielding and light management procedures and technology (see staff Condition of Certification **VIS-5**).
Industrial and Manufacturing	Policy (d): Night lighting shall be provided in industrial areas for security and shall be directed away from adjacent properties.	UNCERTAIN / YES	The proposed project incorporates directional shielding and light management procedures and technology (see also staff Condition of Certification **VIS-5**).

APPLICANT'S PROPOSED MITIGATION MEASURES

The Applicant has proposed sixteen (16) mitigation measures to be incorporated into the project design to minimize visual impacts associated with the operation of the facility:

Power Plant and Compressor Station

5. The project's major structures have been located to provide setbacks from surrounding roads.
6. Placement of the one-story warehouse/administration/water treatment building, water tanks, and other smaller structures on the western edge of the project site to create a transition in scale between the corridor along Antelope Road and the plant's taller features.
7. Planting of street trees and a line of taller screening trees along the edges of the project site bordering Antelope Road to create visual continuity with the landscape pattern along other streets in the Menifee North industrial area, and to screen near views into the site and toward the site's taller elements.
8. Placement of a border of trees consisting of informal groupings of fast-growing broadleaf trees along all sides of the power plant and compressor station sites to provide partial screening of views toward the site from nearby areas and more distant locations.
9. Use of neutral gray and gray-taupe colors for the structures in the Energy Center, switchyard, and compressor station to visually integrate them into their landscape backdrops.
10. Color treatment of fences to blend with the surrounding environment.
11. Minimal signage and construction of project signs using non-glare materials and unobtrusive colors. The design of any signs required by safety regulations will need to conform to the criteria established by those regulations.
12. Minimization of lighting to areas required for safety, security, or operations, and shielding of lighting from public view to the extent possible. Timers and sensors will be used to minimize the time that lights are on in areas where lighting is not normally needed for safety, security, or operation.
13. Direction and shielding of lighting to reduce light scatter and glare. Highly directional light fixtures will be used.
14. Design and installation of temporary screening fencing around the laydown area to reduce the visibility of construction period activities.

Switchyard and Transmission Line

15. The switchyard will make use of low profile equipment to minimize its visibility beyond the tree rows that will be planted around it.
16. The towers will be treated with a neutral gray finish to maximize their visual integration into the backdrop.

17. Non-specular conductors will be used.
18. Insulators will be non-reflective and non-refractive.

Pipelines

19. After construction, ground surfaces will be restored to their original condition, and any vegetation or paving that had been removed during the construction process will be replaced.
20. Equipment in the gas metering and raw water pump stations will be painted earth-tone colors selected to maximize their visual integration into their backdrops.

ADDITIONAL MITIGATION PROPOSED BY STAFF

Energy Commission staff have identified significant visual impacts resulting from visibility of project structures and night lighting. While staff generally agrees with the applicant's proposals to mitigate project structure and lighting impacts, staff's position is that some of these mitigation measures need to be more precisely developed and in some cases expanded in conditions of certification. Applicant's Mitigation Measures 10 and 15 regarding project construction are addressed in Condition of Certification VIS-1. Applicant's Mitigation Measures 5, 6, 12, 13, 14 and 16 regarding color treatment of project structures and use of non-reflective and non-refractive materials are addressed in Condition of Certification VIS-2.

Applicant's Mitigation Measures 3 and 4 regarding vegetative screening of project structures are addressed in Condition of Certification VIS-3. In prior cases, project applicants have questioned the appropriateness and feasibility of achieving effective project screening within a five-year time frame as required in Condition of Certification VIS-3. As previously discussed, staff considers visual impacts extending beyond five years to be long-term impacts. Staff supports the five-year requirement in order to avoid along-term visual impacts. It is also staff's opinion that with the use of berms and larger specimens of fast-growing tree species, as well as strategic placement of plantings, it may be feasible to accomplish effective screening of project structures within the five-year time requirement stipulated in Condition of Certification VIS-3. Staff proposes that a workshop be convened to discuss specific approaches to meet the requirements of VIS-3.

Applicant's Mitigation Measures 8 and 9 regarding night lighting control are addressed in Conditions of Certification VIS-4 and VIS-5. Applicant's Mitigation Measure 7 regarding signage is addressed in Condition of Certification VIS-6. Applicant's Mitigation Measures 1, 2, and 11 regarding project design are addressed in Condition of Certification VIS-7. The possible need for additional measures to mitigate project water vapor plumes is discussed below.

Mitigation of Impacts of Visible Plumes

The high frequency of plume occurrence and substantial size of the plumes that would form may cause significant visual impacts when viewed within both the immediate project vicinity and greater project region. However, staff is in the process of obtaining additional information necessary to complete the vapor plume impact analysis. Therefore, staff is unable to determine the impact significance of visible vapor plumes or

the need for mitigation measures at this time. However, should plume visual impacts prove to be significant, mitigation measures could include: (a) the use of an enconomizer bypass, or equally effective means, to reduce HRSG visible plume frequency to less than 10 percent of seasonal daylight no rain/no fog hours; (b) use of a plume abated wet/dry cooling tower, or equally effective means to reduce cooling tower visible plume frequency to less than 10 percent of seasonal daylight no rain/no fog hours; and (c) use of automated control systems to ensure that plumes are abated to the maximum extent possible for the stipulated design point.

Mitigation of Impacts in Relation to CEQA Significance Criteria

The proposed project has the potential to cause significant visual impacts with respect to two of the four CEQA significance criteria. Project structures would degrade the existing character and quality of the site and its surroundings (Criterion 3). The Applicant's mitigation measures 5, 6, 12, and 16 would require the use of neutral gray, gray-taupe, and earth-tone colors to blend project structures with the surrounding landscape. Applicant mitigation measures 13 and 14 would require the use of non-specular conductors and non-reflective and non-refractive insulators in order to prevent the occurrence of glare. Staff's Condition of Certification **VIS-2** further augments the requirements for appropriate structure color and surface treatments. The Applicant's mitigation measures 3 and 4 would require the planting of trees to screen project structures from local views. Staff's Condition of Certification **VIS-3** further augments the requirements for appropriate screening vegetation. Effective Implementation of the Applicant's proposed mitigation measures as augmented by staff's conditions of certification would reduce the visual impacts of project structures under Criterion 3 to levels that would not be significant.

The project's night lighting has the potential to create a new source of substantial light that would adversely affect nighttime views in the area and result in a significant visual impact under Criterion 4. However, the exterior lighting control measures proposed by the applicant and expanded by staff in Condition of Certification **VIS-5** would ensure that lighting impacts would be less than significant with regard to Criterion 4.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that the project as proposed would cause adverse and significant visual impacts. However, with effective implementation of staff's seven conditions of certification, the project's visual impacts that staff has thus far identified as significant would be reduced to levels that would be less than significant. Staff has not completed its assessment of the visual impacts of the project's plumes, and the potential need for mitigation of those impacts.

Staff also concludes that the project as proposed would be consistent with the ten local LORS that pertain to the enhancement and/or maintenance of visual quality and the protection of views.

The results of staff's visual analysis are that with implementation of staff's proposed conditions of certification, identified visual impacts would be reduced to less than significant levels.

RECOMMENDATIONS

The Energy Commission should adopt the following conditions of certification if it approves the project. Since there is some uncertainty as to the Applicant's ability to accomplish the necessary landscape screening within staff's five-year time requirement, the Energy Commission staff should convene a workshop to evaluate the feasibility of Condition of Certification **VIS-3**. The workshop should address vegetation species to be used, specimen size at planting, the need for modification of planting locations to achieve effective screening placement, and the appropriateness of additional measures to enhance screening effectiveness such as the use of berms.

It is particularly important that Condition of Certification **VIS-3** be effectively implemented in order to adequately mitigate the significant visual impact that would result from the project's structures. It should be noted that staff has not yet completed the vapor plume visual impact analysis. Depending on the outcome of that analysis, staff may recommend additional conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 If the project site or staging areas, or material and equipment storage areas are visible from nearby residences and roadways including I-215, SR-74, Ethanac Road, Dawson Road, Almaden Lane, McLaughlin Road, Menifee Road, and Murrieta Boulevard, the project owner shall install temporary screening to screen the project from those views. Screening shall be of an appropriate design and color for each specific location, as determined by the CPM. All evidence of construction activities, including ground disturbance due to staging and storage areas, shall be removed and remediated to an original or improved condition upon completion of construction including the replacement of any vegetation or paving removed during construction.

The project owner shall submit to the CPM for review and approval a specific screening and restoration plan whose proper implementation will satisfy these requirements.

The project owner shall not implement the screening and restoration plan until receiving written approval from the CPM.

Verification: At least 90 days prior to the start of site mobilization, the project owner shall submit a screening and restoration plan to the CPM for review and approval and to Riverside County for review and comment.

If the CPM notifies the project owner that any revisions of the screening and restoration 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 after installing screening at staging and material and equipment storage areas that it is ready for inspection.

The project owner shall notify the CPM within seven days after completing the surface restoration that it is ready for inspection.

VIS-2 Prior to first turbine roll, the project owner shall treat the surfaces of all project structures and buildings visible to the public such that their colors minimize visual intrusion and contrast by blending with the landscape; their surfaces do not create glare; and they are consistent with local laws, ordinances, regulations, and standards. The project owner shall submit for CPM review and approval, a specific treatment plan whose proper implementation will satisfy these requirements. The treatment plan shall include:

a) Specification, and 11" x 17" color simulations at life size scale, of the treatment proposed for use on project structures, including structures treated during manufacture;

b) A list of each major project structure, building, tank, transmission line tower and/or pole, and fencing specifying the color(s) and finish proposed for each (colors must be identified by name and by vendor brand or a universal designation);

c) Two sets of brochures and/or color chips for each proposed color;

d) Samples of each proposed treatment and color on each material to which they would be applied that would be visible to the public;

e) A detailed schedule for completion of the treatment; and

f) A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or structures treated on site, until the project owner receives notification of approval of the treatment plan by the CPM.

Verification: The project owner shall submit its proposed treatment plan at least 90 days prior to ordering the first structures that are color treated during manufacture.

If a revision is required, the project owner shall provide the CPM with a revised plan within 30 days of receiving notification that revisions are needed.

Prior to first turbine roll, the project owner shall notify the CPM that all buildings and structures are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-3 The project owner shall provide landscaping that is effective in screening the proposed project (including the gas compressor station) from views from I-215, SR-74, Ethanac Road, Dawson Road, Almaden Lane, Spring Winds Drive, North Winds Drive, McLaughlin Road, Menifee, and nearby residences. Trees and other vegetation consisting of informal groupings of fast-growing evergreen trees must be strategically placed and of sufficient density and height to effectively screen the majority of structural forms within five years after first turbine roll. Depending on the effectiveness of the resulting screening of the structures, landscaping may include: (1) the planting of street trees and a line of taller screening trees along the edges of the project site bordering Antelope Road, and (2) the placement of informal groupings of fast-growing broadleaf trees along all sides of the power plant and compressor station sites. **VISUAL RESOURCES Figures 11C, 12C, 13C, 14C, 15C, and 16C** illustrate a degree of project screening that is considered effective.

The project owner shall submit a landscaping plan to the CPM for review and approval. The plan shall include:

a) 11”x17” color simulations of the proposed landscaping at 5 years as viewed from KOPs 1, 2, 3, 4, 5 and 6; and

b) a detailed list of plants to be used and times to maturity given their size and age at planting;.

The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM. In addition, the plan must be implemented by start of project operation.

Verification: Prior to first turbine roll and at least 90 days prior to installing the landscaping, the project owner shall submit the landscaping plan to the CPM for review and approval and to Riverside County for review and comment.

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 The project owner shall ensure that lighting for construction of the power plant is used in a manner that minimizes potential night lighting impacts, as follows:

a) All lighting shall be of minimum necessary brightness consistent with worker safety;

b) All fixed position lighting shall be shielded, hooded, and directed downward to minimize backscatter to the night sky and direct light trespass (direct lighting extending outside the boundaries of the construction area);

c) Wherever feasible and safe, lighting shall be kept off when not in use and motion detectors shall be employed; and

d) A lighting complaint resolution form (following the general format of that in **VISUAL RESOURCES Appendix VR-2**) shall be maintained by plant construction management, to record all lighting complaints received and to document the resolution of that complaint.

Verification: Within seven days after the first use of construction lighting, the project owner shall notify the CPM that the lighting is ready for inspection.

If the CPM notifies the project owner that modifications to the lighting are needed to minimize impacts, within fifteen days of receiving that notification the project owner shall implement the necessary modifications and notify the CPM that the modifications have been completed.

The project owner shall report any lighting complaints and documentation of resolution in the Monthly Compliance Report, accompanied by any lighting complaint resolution forms for that month.

VIS-5 The project owner shall design and install all permanent lighting such that light bulbs and reflectors are not visible from public viewing areas; lighting does not cause reflected glare; and illumination of the project, the vicinity, and the nighttime sky is minimized. To meet these requirements the project owner shall ensure that:

a) Lighting shall be designed so 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 the lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;

b) All lighting shall be of minimum necessary brightness consistent with worker safety;

c) High illumination areas not occupied on a continuous basis (such as maintenance platforms) shall have switches or motion detectors to light the area only when occupied; and

d) A lighting complaint resolution form (following the general format of that in **VISUAL RESOURCES Appendix VR-2**) shall 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.

Verification: At least 60 days prior to ordering any permanent exterior lighting, the project owner shall submit to the CPM for review and comment written documentation describing the lighting control measures and fixtures, hoods, shields proposed for use, and incorporate the CPM's comments in lighting equipment orders.

Prior to first turbine roll, the project owner shall notify the CPM that the lighting has been completed and is ready for inspection. If the CPM notifies the project owner that

modifications to the lighting are needed, within 30 days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed.

The project owner shall report any complaints about permanent lighting and provide documentation of resolution in the Annual Compliance Report, accompanied by any lighting complaint resolution forms for that year.

VIS-6 The project owner shall comply with the signage requirements of Riverside County. In addition, the project owner shall install minimal signage, which shall be constructed of non-glare materials and unobtrusive colors. The design of any signs required by safety regulations shall conform to the criteria established by those regulations. The project owner shall submit a signage plan for the project to the CPM for review and approval and to Riverside County for review and comment. The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

Verification: Prior to first turbine roll and at least 90 days prior to installing signage, the project owner shall submit the signage plan to the CPM for review and approval and to Riverside County for review and comment.

If the CPM notifies the project owner that revisions of the plan 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 signage that they are ready for inspection.

VIS-7 The project owner shall implement project design measures that minimize visual impacts associated with project operation.

The project owner shall minimize project operational impacts by implementing the following:

a) The project owner shall create a minimum 50-foot setback of project structures from surrounding roads;

b) The project owner shall place the one-story warehouse / administration / water treatment building, water tanks, and other smaller structures on the western edge of the project site to create a transition in scale between the corridor along Antelope Road and the plant's taller features; and

c) The switchyard will make use of low profile equipment to minimize its visibility beyond the tree rows that will be planted around it;

Verification: At least 60 days prior to the start of site mobilization, the project owner shall submit to the CPM for review and approval, the specifications for (a) project setbacks, (b) structural placement, and (c) switchyard equipment with evidence that such equipment qualifies as low profile.

If the CPM notifies the project owner that any revisions of the specifications are needed prior to CPM approval, within 30 days of receiving that notification, the project owner shall submit to the CPM revised specifications.

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APPENDIX VR – 1: SUMMARY OF ANALYSIS

APPENDIX VR – 2

LIGHTING COMPLAINT RESOLUTION FORM

Inland Empire Energy Center Riverside County, California
Complainant's name and address: Phone number:
Date complaint received: Time complaint received:
Nature of lighting complaint:
Definition of problem after investigation by plant personnel: Date complainant first contacted:
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.)

APPENDIX VR – 3: VISUAL RESOURCES FIGURES

VISUAL RESOURCES FIGURES 1 THROUGH 17

VISUAL RESOURCES Figure 1

Visual Resources Figure #s	Applicant Source Figure #s	***Title* and Additional Graphic Production Guidance**
1	Figure DR 137-1 FWEC 2002c	*Location of Landscape Character Photographs Along the Proposed Wastewater Pipeline Route* Use Figure DR 137-1 as is and modify title blocks as appropriate.

DISCARD THIS PLACEHOLDER BEFORE PUBLISHING

VISUAL RESOURCES Figures 2 and 3

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
2	Photo DR 137-1 FWEC 2002c	*Landscape Character Along the Proposed Wastewater Pipeline Route.* Replace Photo DR 137-1 in caption beneath image with Figure 2 and use remaining caption as is. Add title block as appropriate.
3	Photo DR 137-2 FWEC 2002c	*Landscape Character Along the Proposed Wastewater Pipeline Route.* Replace Photo DR 137-2 in caption beneath image with Figure 3 and use remaining caption as is. Add title block as appropriate.

DISCARD THIS PLACEHOLDER BEFORE PUBLISHING

VISUAL RESOURCES Figures 4 and 5

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
4	Photo DR 137-3 FWEC 2002c	*Landscape Character Along the Proposed Wastewater Pipeline Route.* Replace Photo DR 137-3 in caption beneath image with Figure 4 and use remaining caption as is. Add title block as appropriate.
5	Photo DR 137-4 FWEC 2002c	*Landscape Character Along the Proposed Wastewater Pipeline Route.* Replace Photo DR 137-4 in caption beneath image with Figure 5 and use remaining caption as is. Add title block as appropriate.

DISCARD THIS PLACEHOLDER BEFORE PUBLISHING

VISUAL RESOURCES Figures 6 and 7

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
6	Photo DR 137-5 FWEC 2002c	*Landscape Character Along the Proposed Wastewater Pipeline Route.* Replace Photo DR 137-5 in caption beneath image with Figure 6 and use remaining caption as is. Add title block as appropriate.
7	Photo DR 137-6 FWEC 2002c	*Landscape Character Along the Proposed Wastewater Pipeline Route.* Replace Photo DR 137-6 in caption beneath image with Figure 7 and use remaining caption as is. Add title block as appropriate.

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VISUAL RESOURCES Figures 8 and 9

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
8	Photo DR 137-7 FWEC 2002c	*Landscape Character Along the Proposed Wastewater Pipeline Route.* Replace Photo DR 137-7 in caption beneath image with Figure 8 and use remaining caption as is. Add title block as appropriate.
9	Photo DR 137-8 FWEC 2002c	*Landscape Character Along the Proposed Wastewater Pipeline Route.* Replace Photo DR 137-8 in caption beneath image with Figure 9 and use remaining caption as is. Add title block as appropriate.

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VISUAL RESOURCES Figure 10

Visual Resources Figure #s	Applicant Source Figure #s	***Title* and Additional Graphic Production Guidance**
10	AFC Figure 5.10-1 Calpine 2001a	*Location of Key Observation Points.* Modify title block as appropriate.

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VISUAL RESOURCES Figure 11A

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
11A	KOP 1 Existing View IEEC 2002e	*KOP 1 – Existing view to the northeast from the intersection of Dawson Road and Almaden Lane.*

DISCARD THIS PLACEHOLDER BEFORE PUBLISHING

VISUAL RESOURCES Figure 11B

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
11B	KOP 1 – Visual simulation of project at start of operation IEEC 2002e	*KOP 1 – Visual simulation of the proposed project at the start of project operation, as viewed the intersection of Dawson Road and Almaden Lane.*

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VISUAL RESOURCES Figure 11C

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
11C	KOP 1 – Visual simulation of project at 20 years IEEC 2002e	*KOP 1 – Visual simulation of the proposed project at 20 years, as viewed from the intersection of Dawson Road and Almaden Lane.*

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VISUAL RESOURCES Figure 12A

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
12A	KOP 2 – Existing View IEEC 2002e	*KOP 2 – Existing view to the northeast from the intersection of Dawson Road and McLaughlin Road.*

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VISUAL RESOURCES Figure 12B

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
12B	KOP 2 – Visual simulation of project at start of operation IEEC 2002e	*KOP 2 – Visual simulation of the proposed project at the start of project operation, as viewed the intersection of Dawson Road and McLaughlin Road.*

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VISUAL RESOURCES Figure 12C

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
12C	KOP 2 – Visual simulation of project at 20 years IEEC 2002e	*KOP 2 – Visual simulation of the proposed project at 20 years, as viewed from the intersection of Dawson Road and McLaughlin Road.*

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VISUAL RESOURCES Figure 13A

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
13A	KOP 3 – Existing View IEEC 2002e	*KOP 3 – Existing view to the southeast from Ethanac Road near Tyler Avenue.*

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VISUAL RESOURCES Figure 13B

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
13B	KOP 3 – Visual Simulation of project at start of operation IEEC 2002e	*KOP 3 – Visual simulation of the proposed project as viewed from Ethanac Road near Tyler Avenue.*

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VISUAL RESOURCES Figure 13C

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
13C	KOP 3 – Visual Simulation of project at 20 years IEEC 2002e	*KOP 3 – Visual simulation of the proposed project at 20 years, as viewed from Ethanac Road near Tyler Avenue.*

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VISUAL RESOURCES Figure 14A

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
14A	KOP 4 – Existing View IEEC 2002e	*KOP 4 – Existing view to the south from Spring Winds Drive just east of North Winds Drive.*

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VISUAL RESOURCES Figure 14B

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
14B	KOP 4 – Visual simulation of project at start of operation IEEC 2002e	*KOP 4 – Visual simulation of the proposed project at the start of operation, as viewed from Spring Winds Drive just east of North Winds Drive.*

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VISUAL RESOURCES Figure 14C

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
14C	KOP 4 – Visual simulation of project at 20 years IEEC 2002f	*KOP 4 – Visual simulation of the proposed project at 20 years, as viewed from Spring Winds Drive just east of North Winds Drive.*

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VISUAL RESOURCES Figure 15A

Visual Resources Figure #s	Applicant Source Figure #s	***Title* and Additional Graphic Production Guidance**
15A	KOP 5 – Existing View IEEC 2002e	*KOP 5 – Existing view to the southwest from SR-74, at the Post Office parking lot exit.*

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VISUAL RESOURCES Figure 15B

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
15B	KOP 5 – Visual simulation of project at start of operation IEEC 2002e	*KOP 5 – Visual simulation of the proposed project at the start of operation, as viewed from SR-74, at the Post Office parking lot exit.*

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VISUAL RESOURCES Figure 15C

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
15C	KOP 5 – Visual simulation of project at 20 years IEEC 2002f	*KOP 5 – Visual simulation of the proposed project at 20 years, as viewed from SR-74, at the Post Office parking lot exit.*

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VISUAL RESOURCES Figure 16A

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
16A	KOP 6 – Existing View IEEC 2002e	*KOP 6 – Existing view to the west toward the gas compressor site from Menifee Road.*

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VISUAL RESOURCES Figure 16B

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
16B	KOP 6 – Visual simulation of project at start of operation IEEC 2002e	*KOP 6 – Visual simulation of the gas compressor station at the start of operation, as viewed from Menifee Road.*

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VISUAL RESOURCES Figure 16C

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
16C	KOP 6 – Visual simulation of project at 20 years IEEC 2002e	*KOP 6 – Visual simulation of the gas compressor station at 20 years, as viewed from Menifee Road.*

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VISUAL RESOURCES Figure 17

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
17	Figure 149 – 1 Conceptual Landscape Plan IEEC 2002f	*Proposed Project Conceptual Landscape Plan*

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WASTE MANAGEMENT

Alvin J. Greenberg, Ph.D.

INTRODUCTION

This analysis presents an assessment of issues associated with managing wastes generated from constructing and operating the proposed Inland Empire Energy Center (IEEC). Staff evaluated the proposed waste management plans and mitigation measures designed to reduce the risks and environmental impacts associated with handling, storing, and disposing of project-related hazardous and nonhazardous wastes. The technical scope of this analysis encompasses wastes generated during facility construction and operation except wastewater discharged pursuant to National Pollutant Discharge Elimination System (NPDES) permits. Wastewater is discussed in the **Soil and Water Resources** section of this document.

Energy Commission staff's objectives in its waste management analysis are to ensure that:

- The management of the wastes will be in compliance with all applicable laws, ordinances, regulations, and standards (LORS). Compliance with LORS ensures that wastes generated during the construction and operation of the proposed project will be managed in an environmentally safe manner; and
- The disposal of project wastes will not result in significant adverse impacts to existing waste disposal facilities.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Resource Conservation and Recovery Act (42 U.S.C. § 6922)

RCRA 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 U.S. Environmental Protection Agency (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 (DTSC) 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, and guidelines to ensure conformance of solid waste facilities with county solid waste management plans; as well as enforcement and administrative provisions.

Title 22, California Code of Regulations, Section 66262.10 et seq. (Generator Standards)

These sections establish requirements for generators of hazardous waste. Under these sections, waste generators must determine if their wastes are hazardous according to either specified characteristics or lists of 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, hazardous waste must only be handled by registered hazardous waste transporters. Generator requirements for record keeping, reporting, packaging, and labeling are also established.

Title 22, California Code of Regulations, Section 67100.1 et seq. (Hazardous Waste Source Reduction and Management Review)

These sections establish reporting requirements for generators of certain hazardous and extremely hazardous wastes in excess of specified limits. The required reports must indicate the generator's waste management plans and performance over the reporting period.

LOCAL

The Riverside County Department of Environmental Health administers the California Laws and Regulations for both solid and hazardous wastes in the proposed project area. This agency has been designated as the local hazardous waste Certified Unified Program Agency (CUPA) by the state of California.

SETTING

PROJECT AND SITE DESCRIPTION

The proposed Inland Empire Energy Center would be located on approximately 35 acres of a 45.8-acre parcel of land at 26226 Antelope Road, southeast of the community of Romoland, in unincorporated Riverside County, California. The property is legally described as Assessor's Parcel Number 331-180-08, in a portion of Section 14, Township 5 South, Range 3 West. The property is bordered by graded dirt roads in two directions: Antelope Road to the west and McLaughlin Road to the south. Mathews Road and Ethanac Avenue exist to the north of the project site, and the Burlington Northern Santa Fe (BNSF) railroad lies to the northeast of the site.

Properties in the general vicinity of the proposed project site are of mixed uses including commercial, residential and vacant properties. The site itself has been used for agricultural purposes since before 1953, and was, at the time of the writing of the AFC, in cultivation with a crop of wheat. The site is relatively flat, and exists at an elevation of approximately 1,445 feet above mean sea level. It is not within a FEMA designated 100-year flood plain.

The proposed IEEC will be a combined-cycle facility consisting of two natural gas-fired Combustion Turbine Generators (CTGs), two Heat Recovery Steam Generators (HRSGs), a Steam Turbine Generator (STG), a deaerating surface condenser, and a mechanical draft cooling tower, along with accompanying control facilities, electrical transformers and switchgear, and other related equipment. New pipelines and connections will be constructed to supply natural gas fuel, cooling and process make-up water, and potable water; and to dispose of non-reclaimable waste water and sewage. A new 500-kilovolt (kV) switchyard and electric transmission line will also be constructed under the ownership of Southern California Edison.

As proposed, the electric generating system will have a nominal generating capacity of approximately 670-megawatts (MW), with a projected overall annual availability factor of 92 to 98 percent. It will be designed to operate under flexible loads adaptable to varying conditions in the energy and service markets.

A Phase I Environmental Site Assessment (ESA) was conducted on the proposed site by Foster Wheeler Environmental Corporation in accordance with methods prescribed by the American Society for Testing and Materials (ASTM Standard E 1527-00). The report of this assessment is dated May 14, 2001 and is included as Appendix H in the AFC. The Phase I ESA found that the site has been either vacant or used for agriculture. The assessment did not identify any "recognized environmental conditions" per the ASTM definition, that is, there was no evidence or record of any use, spillage or disposal of hazardous substances on the site, nor any other environmental concern that would require remedial action.

IMPACTS

PROJECT SPECIFIC IMPACTS

Construction

Site preparation and construction of the proposed generating plant and associated facilities will generate both nonhazardous and hazardous wastes in solid and liquid forms. Table 5.13-1 in the AFC summarizes the various waste streams, estimated quantities and anticipated disposal methods (Calpine 2001a).

Nonhazardous solid wastes anticipated to be generated during construction are detailed in Section 5.13.3.1 of the AFC. Up to 60 total tons of wastes consisting of minimal vegetation debris, lumber, excess concrete, metal, glass, empty non-hazardous chemical containers, paper, cardboard, plastics and insulating materials are anticipated during construction activities. These wastes will be placed in a covered dumpster and transported offsite by a licensed waste contractor for disposal in a Class III facility. Recyclable metal wastes will be segregated and placed into roll-off bins and transported offsite for salvaging or recycling. Approximately 10 tons of recyclable metal waste will be generated. Although not anticipated, if any site soil is found during excavation activities to be unsuitable as backfill material, it would require offsite disposal as well.

Nonhazardous liquid wastes will be generated during construction, including sanitary wastes, storm water runoff, equipment wash water, excavation dewatering waste, and pipe flushing and hydrotesting water. With the exception of the sanitary wastes and the storm water runoff, these liquid wastes will be contained and tested for hazardous characteristics, then either discharged to the sewer system or transported offsite for disposal at a Class I facility based on the test results. The storm water runoff and sanitary wastes are discussed in the **Soil and Water Resources** section of this document.

Hazardous wastes anticipated to be generated during construction are discussed in Section 5.13.3.3 of the AFC. These wastes may include small quantities of waste oil, waste paints, spent solvents, and spent welding materials. The wastes will be stored on site for less than 90 days and properly recycled or disposed of in a permitted Class I facility.

Operation

The proposed IEEC will generate both nonhazardous and hazardous wastes in solid and liquid forms under normal operating conditions. Again, Table 5.13-1 in the AFC lists these wastes along with their respective estimated quantities and anticipated disposal methods.

Nonhazardous solid wastes generated during plant operation are expected to include routine maintenance wastes and office wastes at a total volume of approximately 45 cubic yards per year. Recyclable materials will be segregated and recycled to the extent practical. The remaining wastes would be transported offsite for disposal in a Class III facility.

Nonhazardous liquid wastes will be generated during facility operation including process and sanitary wastewater and storm water runoff. The process water will be reclaimed and reused until the total dissolved solids concentrate to levels requiring that it be discharged to the Eastern Municipal Water District's (EMWD) treatment facility via a new pipeline. Sanitary wastes will be discharged to the EMWD via an existing sewer line. The **Soil and Water Resources** section of this document more fully discusses the wastewater issues at the proposed IEEC.

Hazardous wastes anticipated to be generated during routine project operation include used oil and oil-contaminated materials such as rags and absorbents, spent welding materials, waste paints, spent solvents, used batteries, spent Selective Catalytic Reduction (SCR) catalysts, turbine cleaning waste water, and waste HRSG cleaning chemicals. Although unlikely, cooling tower sludge may also prove to be a hazardous waste.

Approximately 2,575 gallons of waste oil would be generated and subsequently transported to a certified recycler each year. The spent Selective Catalytic Reduction (SCR) emission control catalysts containing heavy metals would require regeneration every three to five years resulting in approximately 70,000 pounds of waste materials from each regeneration. The spent catalyst would be returned to the manufacturer for reclamation and/or disposal. The HRSGs will be cleaned initially and then once every 10 years, resulting in the generation of approximately 144,000 gallons of waste alkaline and acidic products with each cleaning. This waste will require offsite disposal by the cleaning contractor. The CTGs will be cleaned once annually, resulting in the generation of approximately 9,480 gallons of wastewater. This waste would be containerized and tested for hazardous characteristics. Depending on the test results the waste would either be discharged to the wastewater treatment facility or transported to a licensed facility for treatment or disposal.

On page 5.13-9, the AFC states that the IEEC would likely be classified as a Small Quantity Generator of hazardous wastes (generating less than 1,000 kg per any calendar month). This would represent a very small increase in the generation of the total quantities of hazardous wastes within Riverside County.

IMPACT ON EXISTING WASTE DISPOSAL FACILITIES

Nonhazardous solid wastes.

Table 5.13-2 of the AFC lists three Class III facilities that will accept nonhazardous solid wastes from the IEEC project. All three facilities are owned and managed by the Riverside County Waste Management Department and operated by Waste Management of the Inland Empire, Inc. The three facilities possess a total of 11.9 million cubic yards of remaining capacity and closure dates ranging from 2018 to 2035. It is estimated that the IEEC will generate approximately 45 cubic yards of solid nonhazardous waste per year during operation.

Functionally, Waste Management possesses an exclusive contract with the County for solid waste disposal. Consequently, the solid, nonhazardous wastes from the IEEC

would be transported by Waste Management to its Robert A. Nelson Transfer Station for segregation of recyclables and subsequent landfill disposal of the remaining waste. Disposal would likely occur in the Lamb Canyon Landfill, one of the three facilities noted above, possessing a remaining capacity of 5.5 million cubic yards.

Nonhazardous liquid wastes.

None of the three noted landfills will accept liquid wastes. Wastes of this type would be discharged to the EMWD non-reclaimable wastewater pipeline and treated at the EMWD wastewater treatment plant.

Hazardous Wastes.

Section 5.13.2.2 of the AFC discusses the three Class I landfills in California that are permitted to accept hazardous waste: Kettleman Hills in King's County, Buttonwillow (Safety-Kleen) in Kern County, and Superstition Hills (Safety Kleen) in Imperial County. The applicant indicates that, in total, these facilities possess 20 million cubic yards of remaining hazardous waste disposal capacity, with remaining operating lifetimes up to 50 years. The amount of hazardous waste transported to these landfills has decreased in recent years due to source reduction efforts by generators, and the transport of waste out of state that is hazardous under California law, but not federal law.

The applicant indicates that hazardous wastes from the IEEC will be transported to the Safety-Kleen facility located 38 miles away in Highland, California, and from there to appropriate disposal in one of Safety-Kleen's two permitted Class I landfills.

Much of the hazardous waste generated during facility construction and operation will be recycled, such as used oil and spent catalysts. The volume of hazardous waste from the proposed project requiring off-site disposal would be a very small fraction of the existing combined capacity of the three Class I landfills, and would not significantly impact the capacity or remaining life of any of these facilities.

CUMULATIVE IMPACTS

As proposed, the quantities of nonhazardous and hazardous wastes generated during construction and operation of the Inland Empire Energy Center will add to the total quantities of waste generated in Riverside County and the State of California. This facility will generate an estimated 60 total tons of solid waste during construction and approximately 45 cubic yards per year during operation, along with 10 tons per year of metal waste. Additionally, it will produce approximately 2,575 gallons of waste oil each year, 9,480 gallons of CTG wash waste each year, 140,000 gallons of HRSG cleaning waste once every 10 years, and 70,000 pounds of SCR catalyst once every 3 to 5 years.

Capacity is available in a variety of disposal facilities to accommodate the increase of wastes resulting from the IEEC project. In addition, recycling efforts will be prioritized wherever practical to minimize the quantities of waste requiring disposal. Consequently, the added quantities of wastes will not result in significant waste management impacts.

ENVIRONMENTAL JUSTICE

In the **Socioeconomics** section of this Preliminary Staff Assessment, staff presents census tract information that shows less than 50% minority and low-income populations within six miles of the proposed project. Since staff has concluded that there will be no significant direct or cumulative waste-related impacts, there will also be no significant impact to any minority or low-income populations. Therefore, from a waste management prospective, there are no environmental justice issues.

FACILITY CLOSURE

Facility closure is briefly addressed in section 5.13.4 of the Waste Management portion of the AFC. However, during any type of facility closure (see the General Conditions section of this report, which discusses planned, unexpected temporary, and unexpected permanent closure), the primary waste management related concern is that project wastes not pose any potentially significant problem to the public, workers, or the environment. Staff believes that conditions of certification in the General Conditions section will adequately address waste management issues related to closure.

In the case of unexpected temporary closure, waste management practices normally required by LORS and already in place (such as limiting hazardous waste accumulation time to 90 days and requiring proper containment) would be adequate to avoid significant problems. In addition, staff's General Conditions for Facility Closure requires preparation of an on-site contingency plan, which must provide for removal of hazardous wastes and draining of all chemicals from storage tanks and other equipment for temporary closures exceeding 90 days.

An approved on-site contingency plan is also required to protect public health and safety in the case of unexpected permanent closure. As above, the plan must provide for the removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment.

For planned permanent closure, IEEC will develop a facility closure plan at least twelve months prior to commencement of closure and is committed to complying with LORS which are applicable at the time of closure.

COMPLIANCE WITH APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Energy Commission staff concludes that IEEC will be able to comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during facility construction. The applicant is required to dispose of hazardous and non-hazardous wastes at facilities approved by the various departments within the California Environmental Protection Agency (Cal EPA). Because hazardous wastes will be produced during project construction and operation, IEEC will be required to obtain a hazardous waste generator identification number from the California Department of Toxic Substances Control (DTSC). Accordingly, IEEC will be required to properly store, package and label waste, use only approved transporters, prepare hazardous waste

manifests, keep detailed records, and appropriately train its employees. Pursuant to California Code of Regulations Title 22, section 67100.1 et seq., a hazardous waste Source Reduction and Evaluation Review and Plan that meets the requirements of SB-14 must be prepared by IEEC.

MITIGATION

In section 5.13.4 of the AFC the applicant commits to handle and manage wastes according to the hierarchical approach of source reduction, recycling, treatment, and disposal, in that order of priority. The applicant anticipates no significant impacts from its generation of waste products and proposes no further mitigation efforts.

CONCLUSIONS AND RECOMMENDATIONS

Management of the wastes generated during construction and operation of the Inland Empire Energy Center will not result in any significant adverse impacts if IEEC implements the waste management measures proposed in the Application for Certification and the proposed conditions of certification.

CONDITIONS OF CERTIFICATION

WASTE-1 The project owner and, if necessary, its construction contractor, shall each obtain a hazardous waste generator identification numbers from the Department of Toxic Substances Control prior to generating any hazardous waste.

Verification: The project owner shall notify the CPM via the monthly compliance report of the numbers when they are received, and keep a copy of the identification number on file at the project site.

WASTE-2 Upon becoming aware of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed to be taken against the project itself, 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 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the manner in which project-related wastes are managed.

WASTE-3 Prior to the start of both site mobilization and project operation, the project owner shall prepare and submit to the Riverside County Department of Environmental Health and the Eastern Municipal Water District for review and comment and to the CPM for review and approval, waste management plans 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 storage, 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;
- A stated goal that not less than 50 percent of all construction and operation wastes will be recycled. Measures that will allow that goal to be achieved should be identified; and
- A statement that the project owner will participate in the local recycling program to the extent that the local program is consistent with state law.

Verification: No less than 60 days prior to the start of site mobilization, the project owner shall submit the construction waste management plan to the Riverside County Department of Environmental Health, the Eastern Municipal Water District for review, and the CPM. The Monthly Compliance Reports shall document the actual waste management methods used during that reporting month. The operation waste management plan shall be submitted no less than 30 days prior to the start of project operation for review and comment. The project owner shall submit any required revisions within 20 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 a Registered Professional Engineer or Geologist, with experience in remedial investigation and feasibility studies, available for consultation during soil excavation and grading activities. The Registered Professional Engineer or Geologist shall be given full authority to oversee any earth moving activities that have the potential to disturb contaminated soil.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit the qualifications and experience of the Registered Professional Engineer or Geologist to the CPM for approval.

WASTE-5 If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the Registered Professional Engineer or Geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and CPM stating the recommended course of action. Depending on the nature and extent of contamination, the Registered Professional Engineer or Geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the Registered Professional Engineer or Geologist, significant remediation may be required, the project owner shall contact representatives of the Riverside County Department of Environmental Health, the Cypress Regional Office of DTSC, the Santa Ana Regional Water Quality Control Board (if appropriate), and the South Coast Air Quality Management District (if appropriate) for guidance and possible oversight.

Verification: The project owner shall submit any reports filed by the Registered Professional Engineer or Geologist to the CPM within five days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

REFERENCES

Calpine (Calpine Corporation/Hatfield). 2001a. Inland Empire Energy Center, Application for Certification (01-AFC-17). Submitted to the California Energy Commission, August 17, 2001.

WORKER SAFETY AND FIRE PROTECTION

Alvin J. Greenberg, Ph.D. and Rick Tyler

INTRODUCTION

Worker safety and fire protection is legislated by laws, ordinances, regulations, and standards (LORS), and enforced through regulations codified at the Federal, State, and local levels. Worker safety is of utmost priority at the project location and is documented through worker safety practices and training. Industrial workers at the facility operate process equipment and handle hazardous materials daily and may face hazards that can result in accidents and serious injury. Protection measures are employed to either eliminate these hazards or minimize the risk through special training, protective equipment or procedural controls.

The purpose of this Staff Assessment is to assess the worker safety and fire protection measures proposed by the Inland Empire Energy Center (IEEC) project and to determine whether the applicant has proposed adequate measures to:

- comply with applicable safety LORS;
- protect the workers during construction and operation of the facility;
- protect against fire; and
- provide adequate emergency response procedures.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

In December 1970 Congress enacted Public Law 91-596, the Federal Occupational Safety and Health Act of 1970. This Act mandates safety requirements in the workplace and is found in Title 29 of the United States Code, § 651 (29 U.S.C. §§ 651 through 678). Implementing regulations are codified at Title 29 of the Code of Federal Regulations, under General Industry Standards §§ 1910.1 - 1910.1500 and clearly define the procedures for promulgating regulations and conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector. Most of the general industry safety and health standards now in force under the Act represent a compilation of materials from existing federal standards and national consensus standards. These include standards from the voluntary membership organizations of the American National Standards Institute (ANSI) and the National Fire Protection Association (NFPA) which publishes the National Fire Codes.

The purpose of the Occupational Safety and Health Act is to “assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources,” (29 USC § 651). The Federal Department of Labor promulgates and enforces safety and health standards that are applicable to all businesses affecting interstate commerce. The Department of Labor established the

Occupational Safety and Health Administration (OSHA) in 1971 to discharge the responsibilities assigned by the OSH Act.

Applicable Federal requirements include:

- 29 U.S. Code § 651 et seq. (Occupational Safety and Health Act of 1970);
- 29 CFR §1910.1 - 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations);
- 29 CFR §1952.170 – 1952.175 (Federal approval of California's plan for enforcement of its own Safety and Health requirements, in lieu of most of the Federal requirements found in 29 CFR §1910.1 – 1910.1500).

STATE

California passed the Occupational Safety and Health Act of 1973 ("Cal/OSHA") as published in the California Labor Code § 6300. Regulations promulgated as a result of the Act are codified at Title 8 of the California Code of Regulations, beginning with §337-560 and continuing with §1514 through 8568. The California Labor Code requires that the Cal/OSHA Standards Board adopt standards at least as effective as the federal standards (Labor Code § 142.3(a)) and thus all Cal/OSHA health and safety standards meet or exceed the Federal requirements. Hence, California obtained federal approval of its State health and safety regulations, in lieu of the federal requirements published at 29 CFR §1910.1 - 1910.1500). The Federal Secretary of Labor, however, continually oversees California's program and will enforce any federal standard for which the State has not adopted a Cal/OSHA counterpart.

The State of California Department of Industrial Relations is charged with responsibility for administering the Cal/OSHA plan. The Department of Industrial Relations is further split into six divisions to oversee, among other activities: industrial accidents, occupational safety and health, labor standards enforcement, statistics and research, and the State Compensation Insurance Fund (workers compensation).

Employers are responsible for informing their employees about workplace hazards, potential exposure and the work environment (Labor Code § 6408). Cal/OSHA's principal tool in ensuring that workers and the public are informed is the Hazard Communication standard first adopted in 1981 (8 CCR §5194). This regulation was promulgated in response to California's Hazardous Substances Information and Training Act of 1980. It was later revised to mirror the Federal Hazard Communication Standard (29 CFR §1910.1200) which established on the federal level an employee's "right to know" about chemical hazards in the workplace, but added the provision of applicability to public sector employers. A major component of this regulation is the required provision of Material Safety Data Sheets (MSDSs) to workers. MSDSs provide information on the identity, toxicity, and precautions to take when using or handling hazardous materials in the workplace.

Finally, 8 CCR §3203 requires that employers establish and maintain a written Injury and Illness Prevent Program to identify workplace hazards and communicate them to its employees through a formal employee-training program.

Applicable State requirements include:

- 8 CCR §339 - List of hazardous chemicals relating to the Hazardous Substance Information and Training Act;
- 8 CCR §337, et seq. Cal/OSHA regulations;
- 24 CCR § 3, et seq. - incorporates the current edition of the Uniform Building Code;
- Health and Safety Code § 25500, et seq. - Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at the facility;
- Health and Safety Code § 25500 - 25541 - Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at the facility.

LOCAL

The California Building Standards Code published at Title 24 of the California Code of Regulations § 3 et seq. consists of eleven parts containing the building design and construction requirements relating to fire and life safety and structural safety. The Building Standards Code includes the electrical, mechanical, energy, and fire codes applicable to the project. Local planning/building & safety departments enforce the California Building Code.

National Fire Protection Association (NFPA) standards are published in the California Fire Code. The fire code contains general provisions for fire safety, including but not restricted to: 1) required road and building access; 2) water supplies; 3) installation of fire protection and life safety systems; 4) fire-resistive construction; 5) general fire safety precautions; 6) storage of combustible materials; 7) exits and emergency escapes; and 8) fire alarm systems. The California Fire Code reflects the body of regulations published at Part 9 of Title 24 of the California Code of Regulations.

Similarly, the Uniform Fire Code (UFC) Standards, a companion publication to the California Fire Code, contain standards of the American Society for Testing and Materials and the NFPA. It is the United State's premier model fire code. It is updated annually as a supplement and published every third year by the International Fire Code Institute to include all approved code changes in a new edition. Riverside County adopted the 1997 Uniform Fire Code in 1999. The Riverside County Fire Department administers the UFC.

Applicable local (or locally enforced) requirements include:

- 1998 Edition of California Fire Code and all applicable NFPA standards (24 CCR Part 9);
- California Building Code Title 24, California Code of Regulations (24 CCR § 3, et seq.); and
- Uniform Fire Code, 1997.

SETTING

The proposed project is located near the town of Romoland in unincorporated Riverside County.

The Inland Empire Energy Center (IEEC) project involves construction and operation of a combined cycle natural gas fired cogeneration facility with ancillary facilities including pipelines.

Fire support services to the site will be under the jurisdiction of the Riverside County Fire Department and the California Department of Forestry. Sun City Fire Station No. 7 is the closest station to the site and is located at 27860 Bradley Road. The response time to the project site is estimated to be approximately 2 minutes (Wetherholt 2002).

Menifee Lake Station, located on the corner of Newport Rd. and Menifee Rd. approximately 7 miles away for the project site, is assigned as the off-site hazardous materials (hazmat) first responder for the IEEC. This station has a hazmat team staffed by five hazmat trained personnel. Their estimated response time is 7 to 10 minutes and they have mutual aid agreements with other teams in the area (Fulcher 2002).

IMPACTS

WORKER SAFETY

Industrial environments are potentially dangerous during construction and operation of facilities. Workers at the proposed project will be exposed to loud noises, moving equipment, trenches, and confined space entry and egress problems. The workers may experience falls, trips, burns, lacerations, and numerous other injuries. They have the potential to be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks and electrocution. It is important for the Inland Empire Energy Center project to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers. If the facility complies with all LORS, workers will be adequately protected from health and safety hazards.

FIRE HAZARDS

During construction and operation of the proposed Inland Empire Energy Center project there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, natural gas or flammable liquids, explosions, and over-heated equipment may cause small fires. Major structural fires may develop from uncontrolled fires or be caused by large explosions of natural gas or other flammable gasses or liquids. Compliance with all LORS will be adequate to assure protection from all fire hazards.

APPLICANT'S PROPOSED MITIGATION

WORKER SAFETY

A Safety and Health Program will be prepared by the applicant to minimize worker hazards during construction and operation. Staff uses the phrase "Safety and Health Program" to refer to the measures that will be taken to ensure compliance with the applicable LORS during the construction and operational phases of the project.

Construction Safety and Health Program

The Inland Empire Energy Center project encompasses construction and operation of a natural gas fired facility with ancillary facilities such as transmission lines and pipelines. Workers will be exposed to hazards typical of construction and operation of a gas-fired combined cycle facility.

Construction Safety Orders are published at 8 CCR § 1502, et seq. These requirements are promulgated by Cal/OSHA and are applicable to the construction phases of the project. The Construction Safety and Health Program will include the following:

- Construction Injury and Illness Prevention Program (8 CCR § 1509);
- Construction Fire Protection and Prevention Plan (8 CCR § 1920); and
- Personal Protective Equipment Program (8 CCR §§ 1514 - 1522).

Additional programs under General Industry Safety Orders (8 CCR §§ 3200 - 6184), Electrical Safety Orders (8 CCR §§2299 - 2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450 - 544) will include:

- Electrical Safety Program;
- Unfired Pressure Vessel Safety Orders;
- Equipment Safety Program;
- Forklift Operation Program;
- Excavation/Trenching Program;
- Fall Prevention Program;
- Scaffolding/Ladder Safety Program;
- Articulating Boom Platforms Program;
- Crane and Material Handling Program;
- Housekeeping and Material Handling and Storage Program;
- Hot Work Safety Program;
- Respiratory Protection Program;
- Employee Exposure Monitoring Program;
- Confined Space Entry Program;

- Hand and Portable Power Tool Safety Program;
- Hearing Conservation Program;
- Back Injury Prevention Program;
- Hazard Communication Program;
- Air Monitoring Program;
- Heat and Cold Stress Monitoring and Control Program; and
- Pressure Vessel and Pipeline Safety Program.

The AFC includes adequate outlines of each of the above programs. Prior to the start of construction of the Inland Empire Energy Center project, detailed programs and plans will be provided pursuant to condition of certification **WORKER SAFETY-1**.

Operations and Maintenance Safety and Health Program

Upon completion of construction and prior to operations at the Inland Empire Energy Center project, the Operations and Maintenance Safety and Health Program will be prepared. This operational safety program will include the following programs and plans:

- Injury and Illness Prevention Program (8 CCR § 3203);
- Emergency Action Plan (8 CCR § 3220);
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (8 CCR § 3221); and
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

In addition, the requirements under General Industry Safety Orders (8 CCR §§ 3200 - 6184), Electrical Safety Orders (8 CCR §§2299 - 2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450 - 544) will be applicable to the project. Written safety programs, which the applicant will develop, for the Inland Empire Energy Center project will ensure compliance with the above-mentioned requirements.

The AFC includes an adequate outline of the Emergency Action Plan (Calpine 2001a, page 5.14-11). Prior to operation of the Inland Empire Energy Center project, all detailed programs and plans will be provided pursuant to condition of certification **WORKER SAFETY-2**.

Safety and Health Program Elements

The Applicant provided the proposed outlines for both a Construction Safety and Health Program and an Operation Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law. The major items required in both Safety and Health Programs are as follows:

Injury and Illness Prevention Program (IIPP)

The Applicant will submit an expanded Construction and Operations Illness and Injury Prevention Program to Cal/OSHA for review and comment 30 days prior to construction and operation of the project.

The IIPP will include the following components as presented in the AFC:

- Identity of person(s) with authority and responsibility for implementing the program;
- System ensuring employees comply with safe and healthy work practices;
- System facilitating employer-employee communications;
- Procedures identifying and evaluating workplace hazards, including inspections to identify hazards and unsafe conditions;
- Methods for correcting unhealthy/unsafe conditions in a timely manner;
- Methods of documenting inspections and training and for maintaining records; and
- A training program for:
- introducing the IIPP;
- new, transferred, or promoted employees;
- new processes and equipment;
- supervisors; and
- contractors.

Emergency Action Plan

California regulations require an Emergency Action Plan (8 CCR § 3220). The AFC contains a satisfactory outline for an emergency action plan (page 5.14-11).

The outline lists the following features:

- Purpose and Scope of Emergency Action Plan;
- Personnel Responsibilities during Emergencies;
- Specific Response Procedures;
- Evacuation Plan;
- Emergency Equipment Locations;
- Fire Extinguisher Locations;
- Site Security;
- Accident Reporting and Investigation;
- Lockout/Tagout;
- Hazard Communication;
- Spill Containment and Reporting;

- First Aid and Medical Response;
- Respiratory Protection;
- Personal Protective Equipment;
- Sanitation; and
- Work Site Inspections.

Fire Prevention Plan

California Code of Regulations requires an Operations Fire Prevention Plan (8 CCR § 3221). The AFC describes a proposed fire prevention plan which is acceptable to staff. The plan will include the following topics:

- Responsibilities;
- Procedures for fire control;
- Fixed and portable fire-fighting equipment;
- Housekeeping;
- Employee alarm/communication practices;
- Servicing and refueling areas;
- Training; and
- Flammable and combustible liquid storage.

Staff proposes that the Applicant submit a final Fire Protection and Prevention Plan to the Riverside County Fire Department for review and comment prior to submission to the California Energy Commission Compliance Project Manager (CPM) for review and approval to satisfy proposed conditions of certification **WORKER SAFETY 1** and **2**.

Personal Protective Equipment Program

California regulations require Personal Protective Equipment (PPE) and first aid supplies whenever hazards are encountered that, due to process, environment, chemicals or mechanical irritants, can cause injury or impair bodily function as a result of absorption, inhalation or physical contact (8 CCR § 3380-3400). The Inland Empire Energy Center project operational environment will likely require PPE.

Information provided in the AFC indicates that all employees required to use PPE will be checked for proper fit and to see if they are medically capable of wearing the equipment. All safety equipment will meet NIOSH or ANSI standards and will carry markings, numbers, or certificates of approval. Respirators will meet NIOSH and Cal-OSHA standards. Each employee will be provided with the following information pertaining to the protective clothing and equipment:

- Proper use, maintenance, and storage;
- When the protective clothing and equipment are to be used;
- Benefits and limitations; and

- When and how the protective clothing and equipment are to be replaced.

The PPE Program ensures that employers comply with the applicable requirements for PPE and provide employees with the information and training necessary to implement the program.

Operations and Maintenance Written Safety Program

In addition to the specific plans listed above, there are additional LORS applicable to the project, which are called "safe work practices". Both the Construction and the Operations Safety Programs will address safe work practices under a variety of programs. The components of these programs include the following:

- Fall Protection Program;
- Hot Work Safety Program;
- Confined Space Entry;
- Hearing Conservation Program;
- Hazard Communication Program;
- Process Safety Management (PSM) Program; and
- Contractor Safety Program.

Operations and Maintenance Safety Training Programs

Employees will be trained in the safe work practices described in the above-reference safety programs.

FIRE PROTECTION

Staff reviewed the information provided in the AFC regarding available fire protection services and equipment (Calpine 2001a, Section 5.14, Worker Safety) to determine if the project would adequately protect workers and if it would affect the fire protection services in the area. The project will rely on both onsite fire protection systems and local fire protection services. The onsite fire protection system provides the first line of defense for small fires. In the event of a major fire, fire support services including trained firefighters and equipment for a sustained response would be required by the Riverside County Fire Department.

During construction an interim fire protection system will be in place. The permanent facility fire protection system will be placed in service as early as possible during the construction phase.

The information in the AFC indicates that the project intends to meet the minimum fire protection and suppression requirements. Elements include both fixed and portable fire extinguishing systems. The fire water supply consists of a minimum of 240,000-gallons in the on-site firewater storage tank. The firewater pumping system consists of three fire pumps, two driven by electric motors and the other by a diesel engine. This system will provide more than an adequate quantity of fire-fighting water to yard hydrants, hose stations, and water spray and sprinkler systems. The fire pumps have a capacity of

2,000 gallons/minute to deliver water to the fire protection water piping network. The fire protection loop will be pressurized with potable water from the Eastern Municipal Water District (EMWD).

This fire water supply and an on-site electric fire-water pumping system (with diesel generator back-up) will provide more than an adequate quantity of fire-fighting water to yard hydrants, hose stations, and water spray and sprinkler systems. The motor driven fire pump will be capable of supplying maximum water demand for any automatic sprinkler system plus water for fire hydrants and hose stations.

A carbon dioxide fire protection system will be provided for the combustion turbine generator (CTG) and accessory equipment. Fire detection sensors will also be installed.

A deluge spray system will be provided for the generator transformers and auxiliary power transformer in the event of a fire. Deluge water is fed by the plant underground firewater system.

Fire hydrants and hose stations will supplement the plant fire protection system using water from the plant underground fire water/domestic water system. Fire hydrants with hose houses will be placed at approximately 250-foot intervals around the new fire loop; hydrants will be located and hose houses equipped in accordance with NFPA 24 and local fire codes.

In addition to the fixed fire protection system, smoke detectors, combustible gas detectors, and appropriate class of service portable extinguishers will be located throughout the facility at code-approved intervals.

The applicant will be required to provide the final Fire Protection and Prevention Program to staff and to the Riverside County Fire Department, prior to construction and operation of the project, to confirm the adequacy of the proposed fire protection measures.

Because the proposed facility is located within an area that is currently served by the local fire department, staff reviewed the ability of the local fire department to respond in a timely and adequate manner to a fire at the power plant. The fire risks of the proposed facility are similar to those of existing facilities in the immediate vicinity and thus pose no significant added demands on local fire protection services. In fact, there has not been a significant fire in recent history at a natural gas power plant certified by the Energy Commission.

FACILITY CLOSURE

The project owner/operator is responsible for maintaining an operational fire protection system during closure activities. The project must also stay in compliance with all applicable health and safety LORS during that time. A facility closure plan will be developed prior to closure to incorporate these requirements.

CUMULATIVE IMPACTS

Staff reviewed the potential for the construction and operation of Inland Empire Energy Center project, combined with existing industrial facilities, to result in impacts on the fire and emergency service capabilities of the Riverside County Fire Department and found that cumulative impacts were insignificant. The Riverside County Fire Department spokesperson was confident that the response time was adequate for the fire department to respond to whatever fire occurred at an industrial facility of this type that contained advanced on-site fire suppression equipment (Wetherholt 2002).

CONCLUSION AND RECOMMENDATIONS

If the Applicant for the proposed Inland Empire Energy Center provides a Project Construction Injury and Illness Prevention Program and a Project Operations Safety and Health Program as required by Conditions of Certification **WORKER SAFETY 1** and **2**, staff believes that the project will incorporate sufficient measures to ensure adequate levels of industrial safety, and comply with applicable LORS. Staff also concludes that the proposed project will not have significant impacts on local fire protection services.

If the Commission certifies the project, staff recommends that the Commission adopt the following proposed conditions of certification. The proposed conditions of certification provide assurance that the Construction Injury and Illness Prevention Program and the Operations Safety and Health Program proposed by the applicant will be reviewed by the appropriate agencies before implementation. The conditions also require verification that the proposed plans adequately assure worker safety and fire protection and comply with applicable LORS.

PROPOSED CONDITIONS OF CERTIFICATION

WORKER SAFETY-1 The project owner shall submit to the Compliance Project Manager (CPM) a copy of the Project Construction Safety and Health Program containing the following:

- A Construction Safety Program;
- A Construction Injury and Illness Prevention Progam;
- A Construction Personal Protective Equipment Program;
- A Construction Exposure Monitoring Program;
- A Construction Emergency Action Plan; and
- A Construction Fire Protection and Prevention Plan.

The Safety Program, the Personal Protective Equipment Program, and the Exposure Monitoring Program shall be submitted to the CPM for review and approval concerning compliance of the program with all applicable Safety Orders. The Construction Fire Protection and Prevention Plan and Emergency Action Plan shall be submitted to the Riverside County Fire Department for review and comment prior to submittal to the CPM for review and approval.

Verification At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the Project Construction Safety and Health Program. The project owner shall provide a letter from the Riverside County Fire Department stating that they have reviewed and commented on the Construction Fire Protection and Prevention Plan Emergency Action Plan.

WORKER SAFETY-2 The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- an Operation Injury and Illness Prevention Plan;
- an Emergency Action Plan;
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

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 prior to submittal to the CPM for review and approval. The Operation Fire Protection Plan and the Emergency Action Plan shall also be submitted to the Riverside County Fire Department for review and comment prior to submittal to the CPM for review and approval.

Verification At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety & Health Program.

REFERENCES

1998 California Fire Code. Published by the International Fire Code Institute comprised of the International Conference of Building Officials, the Western Fire Chiefs Association, and the California Building Standards Commission. Whittier, Ca.

Calpine (Calpine Corporation/Hatfield). 2001a. Inland Empire Energy Center, Application for Certification (01-AFC-17). Submitted to the California Energy Commission, August 17, 2001.

Fulcher, Dave. Hazmat team Captain, Riverside County Fire Department, Menifee Lake Station. Personal communications April 18, 2002.

Wetherholt, Scott. Fire Fighter, Riverside County Fire Department, Station No. 7. Personal communications April 18, 2002.

FACILITY DESIGN

Brian Payne

INTRODUCTION

Facility Design encompasses the civil, structural, mechanical and electrical engineering design of the project. The purpose of the Facility Design analysis is to:

- verify that the laws, ordinances, regulations and standards (LORS) applicable to the engineering design and construction of the project have been identified;
- verify that the project and ancillary facilities have been described in sufficient detail, including proposed design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable engineering LORS, and in a manner that assures public health and safety;
- determine whether special design features should be considered during final design to deal with conditions unique to the site which could influence public health and safety; and
- describe the design review and construction inspection process and establish Conditions of Certification that will be used to monitor and ensure compliance with the intent of the engineering LORS and any special design requirements.

FINDINGS REQUIRED

The Warren Alquist Act requires the commission to "prepare a written decision…which includes…(a) Specific provisions relating to the manner in which the proposed facility is to be designed, sited and operated in order to protect environmental quality and assure public health and safety [and] (d)(1) Findings regarding the conformity of the proposed site and related facilities…with public safety standards…and with other relevant local, regional, state and federal standards, ordinances, or laws…" (Pub. Resources Code, §25523).

SUBJECTS DISCUSSED

Subjects discussed in this analysis include:

- Identification of the engineering LORS applicable to facility design;
- Evaluation of the applicant's proposed design criteria, including the identification of those criteria that are essential to ensuring public health and safety;
- Proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable engineering LORS; and
- Conditions of Certification proposed by staff to ensure that the project will be designed and constructed to assure public health and safety and comply with all applicable engineering LORS.

SETTING

Inland Empire Energy Center, LLC, a wholly owned subsidiary of Calpine Corporation (Calpine), proposes to construct and operate a nominally rated 670 megawatt combined cycle electric power generating plant known as the Inland Empire Energy Center (IEEC). The project will be located on a 46 acre site bordered by McLaughlin Road to the south, San Jacinto Road to the east, Antelope Road to the west, and Burlington Northern Santa Fe Railway to the north, near Romoland, in Riverside County, California. For more information on the site and related project description, please see the **Project Description** section of this document.

The site lies in seismic zone 4, the zone of greatest seismic shaking in the United States. Additional engineering design details are contained in the Application for Certification (AFC), Section 5.5 and Appendices A through G (Calpine 2001a).

All references herein to “the County” designate Riverside County.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Lists of LORS applicable to each engineering discipline (civil, structural, mechanical and electrical) are described in the AFC (Calpine 2001a, Tables 6.1-1 and Appendices A through E). Some of these LORS include the California Building Code (CBC) and standards promulgated by the American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), American Society for Testing and Materials (ASTM) and American Welding Society (AWS).

ANALYSIS

The basis of this analysis is the applicant’s proposed analysis and construction methods and list of engineering LORS and design criteria set forth in the AFC.

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage and site access. Staff has assessed the criteria for designing and constructing linear support facilities such as a 0.9 mile, 20” diameter natural gas pipeline; 0.1 mile 12” to 24” recycled water pipeline; 12” diameter potable water pipeline; 4.7 mile, 12” to 18” diameter waste water pipeline; and 0.9 mile 500 kV electric transmission line. The applicant proposes to use accepted industry standards (see AFC Appendices A through E for a representative list of applicable industry standards), design practices and construction methods in preparing and developing the site. Staff concludes that the project, including its linear facilities, will likely comply with all applicable site preparation LORS, and proposes Conditions of Certification (see below and the **Geology and Paleontology** section of this document) to ensure compliance.

MAJOR STRUCTURES, SYSTEMS AND EQUIPMENT

Major structures, systems and equipment are defined as those structures and associated components or equipment that are necessary for power production and are

costly to repair or replace, that require a long lead time to repair or replace, or that are used for the storage, containment, or handling of hazardous or toxic materials. Major structures and equipment will be identified through compliance with proposed Condition of Certification **GEN-2**.

The AFC contains lists of the civil, structural, mechanical and electrical design criteria that demonstrate the likelihood of compliance with applicable engineering LORS, and that staff believes are essential to ensuring that the project is designed in a manner that protects public health and safety.

The project shall be designed and constructed to the 1998 edition of the California Building Code (CBC) and other applicable codes and standards in effect at the time design and construction of the project actually commence. In the event the initial designs are submitted to the Chief Building Official (CBO) for review and approval when the successor to the 1998 CBC is in effect, the 1998 CBC provisions, identified herein, shall be replaced with the applicable successor provisions.

Certain structures in a power plant may be required, under the CBC, to undergo dynamic lateral force (structural) analysis; others may be designed using the simpler static analysis procedure. In order to ensure that structures are analyzed using the appropriate lateral force procedure, staff has included Proposed Condition of Certification **STRUC-1**, which in part requires review and approval by the CBO of the project owner's proposed lateral force procedures prior to the start of construction.

NATURAL GAS PIPELINE

A new 0.9 mile, 20" diameter natural gas pipeline will be constructed to provide fuel to the proposed facility. The line will likely be owned, operated and maintained by either Calpine or Sempra Energy. In addition to the new pipeline, a new natural gas compressor station will also be required. The compressor station will boost pressures within the existing Sempra Energy natural gas transmission system during periods of power plant operation (Calpine 2001a § 3.10.3, Calpine 2001b, and Wood 2002a). The pipeline and compressor station facilities will be designed, constructed, operated, and maintained in accordance with U.S. Department of Transportation (DOT), Title 49, Code of Federal Regulations (CFR) Chapter 1, Part 192 "Transportation of Natural and other Gas by Pipeline: Minimum Federal Safety Standards," and the California Public Utilities Commission, General Order 112-E (CPUC GO 112-E). Compliance with these requirements will help mitigate the impacts of pipeline rupture and unintentional natural gas release by ensuring proper operation and maintenance of the facilities. Therefore, no mitigation beyond a pipeline operated and maintained to applicable regulations is necessary.

PROJECT QUALITY PROCEDURES

The AFC (Calpine 2001a, § 4.3.5) describes a Project Quality Control Program that will be used on the project to maximize confidence that systems and components will be designed, fabricated, stored, transported, installed and tested in accordance with the technical codes and standards appropriate for a power plant. Compliance with design requirements will be verified through an appropriate program of inspections and audits. Employment of this Quality Assurance/Quality Control (QA/QC) program will ensure that

the project is actually designed, procured, fabricated and installed as contemplated in this analysis.

COMPLIANCE MONITORING

Under Section 104.2 of the CBC, the building official is authorized and directed to enforce all the provisions of the CBC. For all energy facilities certified by the Energy Commission, the Energy Commission is the building official and has the responsibility to enforce the code. In addition, the Energy Commission has the power to render interpretations of the CBC and to adopt and enforce rules and supplemental regulations to clarify the application of the CBC's provisions.

The Energy Commission's design review and construction inspection process is developed to conform to CBC requirements and ensure that all facility design Conditions of Certification are met. As provided by Section 104.2.2 of the CBC, the Energy Commission appoints experts to carry out the design review and construction inspections and act as delegate CBO on behalf of the Energy Commission. These delegates typically include the local building official and/or independent consultants hired to provide technical expertise not provided by the local official. The applicant, through permit fees as provided by CBC Sections 107.2 and 107.3, pays the costs of the reviews and inspections. While building permits in addition to the Energy Commission certification are not required for this project, in lieu permit fees are paid by the applicant consistent with CBC Section 107, to cover the costs of reviews and inspections.

Engineering and compliance staff will invite the local building authority, the County, or a third party engineering consultant, to act as CBO for the project. When an entity has been identified to perform the duties of CBO, Energy Commission staff will complete a Memorandum of Understanding (MOU) with that entity that outlines its roles and responsibilities and those of its subcontractors and delegates.

Staff has developed proposed Conditions of Certification to ensure public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities and qualifications of the applicant's engineers responsible for the design and construction of the project (proposed Conditions of Certification **GEN-1** through **GEN-8**). Engineers responsible for the design of the civil, structural, mechanical and electrical portions of the project are required to be registered in California, and to sign and stamp each submittal of design plans, calculations and specifications submitted to the CBO. These conditions require that no element of construction subject to CBO review and approval shall proceed without prior approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written to require that no element of construction of permanent facilities subject to CBO review and approval, which would be difficult to reverse or correct, may proceed without prior approval of plans by the CBO. For those elements of construction that are not difficult to reverse and are allowed to proceed without approval of the plans, the applicant shall bear the

responsibility to fully modify those elements of construction to comply with all design changes that result from the CBO's plan review and approval process.

FACILITY CLOSURE

The removal of a facility from service, or decommissioning, as a result of the project reaching the end of its useful life, may range from "mothballing" to removal of all equipment and appurtenant facilities and restoration of the site. Future conditions that may affect the decommissioning decision are largely unknown at this time.

In order to assure that decommissioning of the facility will be completed in a manner that is environmentally sound, safe and will protect public health and safety, the applicant shall submit a decommissioning plan to the Energy Commission for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of the following items:

- proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
- all applicable LORS, local/regional plans and the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
- the activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
- decommissioning alternatives, other than complete site restoration.

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. Staff has proposed general conditions (see **General Conditions**) to ensure that these measures are included in the Facility Closure plan.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

COUNTY OF RIVERSIDE

The County of Riverside has provided a list of conditions, which they would impose on the project, if the County was responsible for permitting the IEEC (Riverside 2002a). The proposed Condition of Certification **GEN-1**, included in this document, conforms to the City's request. It requires, "The project owner shall design, construct and inspect the project in accordance with the 1998 California Building Code (CBC) and all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval." "All other applicable engineering LORS" is intended to include all local LORS, which include, but are not limited to; County General Plan, Ordinance 457, and any permits which may be issued by the County.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. The laws, ordinances, regulations and standards (LORS) identified in the AFC and supporting documents are those applicable to the project.

2. Staff has evaluated the proposed engineering LORS, design criteria and design methods in the record, and concludes that the design, construction and eventual closure of the project are likely to comply with applicable engineering LORS.

3. The Conditions of Certification proposed will ensure that the proposed facilities are designed and constructed in accordance with applicable engineering LORS. This will occur through the use of design review, plan checking and field inspections, which are to be performed by the CBO or other Energy Commission delegate. Staff will audit the CBO to ensure satisfactory performance.

4. Whereas future conditions that may affect decommissioning are largely unknown at this time, it can reasonably be concluded that if the project owner submits a decommissioning plan as required in the **General Conditions** portion of this document prior to the commencement of decommissioning, the decommissioning procedure is likely to occur in compliance with all applicable engineering LORS.

RECOMMENDATIONS

Energy Commission staff recommends that:

1. The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to assure public health and safety, and to ensure compliance with all applicable engineering LORS;

2. The project be designed and built to the 1998 CBC (or successor standard, if such is in effect when the initial project engineering designs are submitted for review); and

3. The CBO shall review the final designs, conduct plan checking and perform field inspections during construction, and Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct and inspect the project in accordance with the 1998 California Building Code (CBC) and all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval. (The CBC in effect is that edition that has been adopted by the California Building Standards Commission and published at least 180 days previously.) All transmission facilities (lines, switchyards, switching stations and substations) are handled

in Conditions of Certification in the **Transmission System Engineering** section of this document.

In the event that the initial engineering designs are submitted to the CBO when 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: Within 30 days after receipt of the Certificate of Occupancy, the project owner shall submit to the CPM a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable LORS and the Energy Commission's Decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [1998 CBC, Section 109 – Certificate of Occupancy].

GEN-2 Prior to submittal of the initial engineering designs for CBO review, 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 list of proposed submittal packages of designs, calculations and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM when requested.

Verification: At least 60 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the schedule, the Master Drawing List and the Master Specifications List of documents to be submitted to the CBO for review and approval. These documents shall be the pertinent design documents for the major structures and equipment listed in Table 1 below. Major structures and equipment shall be added to or deleted from the Table only with CPM approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1
Major Structures and Equipment List

Equipment/System	Quantity (Plant)
Combustion Turbine (CT) Foundation and Connections	2
CT Mechanical Accessories (e.g. lube oil cooler, static motor starter, NO_x control system, compressor wash system, fire detection system, fuel heating system, etc.) Foundation(s) and Connections	2
CT Structure Shell and Façade Foundation and Connections	2
CT Inlet Air Plenum and Filter Structure, Foundation and Connections	2
CT Inlet Air Fogger Foundation and Connections	2
Combustion Turbine Generator (CTG) Foundation and Connections	2
Heat Recovery Steam Generator (HRSG) Structure, Foundation and Connections	2
HRSG Exhaust Stack, Foundation and Connections	2
HRSG Transition Duct Burner and Forced Draft Structure, Foundations and Connections	2
Selective Catalytic Reduction (SCR) Unit Foundation and Connections	2
Steam Turbine (ST) Foundation and Connections	1
ST Structure Shell and Façade Foundation and Connections	1
Steam Turbine Generator (STG) Foundation and Connections	1
STG Lube Oil Skid Foundation and Connections	1
STG Hydraulic Control System Foundation and Connections	1
Pipe and Cable Way Structures, Foundations and Connections	1 Lot
Electrical MCC, Foundation and Connections	1 Lot
18 kV Auxiliary Step-Down Transformer Foundation and Connections	2
500 kV Step-Up Transformer Foundation and Connections	3
Transformer (4,160 to 480 Volt) Foundation(s) and Connections	1 Lot
Electrical Power Supply System	1 Lot
Electrical Control Centers, Switchgear and Switchyard Equipment Foundations and Connections	1 Lot
Power Distribution Center Foundation and Connections	1 Lot
Generator – 1.000 kW Emergency Foundation and Connections	1
Natural Gas Filter/Scrubber/Separator Foundation and Connections	1 Lot
Natural Gas Separator/Heater Foundation and Connections	1 Lot
Natural Gas Metering and Regulating Station Foundations and Connections	1 Lot
All Building Structures, Foundations and Connections (e.g. Administrative, Control Room, Fire Water Pump House, Water Treatment, Maintenance, Cooling Tower Electrical/Chemical, Warehouse, Raw Water Pump Station, Medium Voltage Switchgear, MCC, etc.)	1 Lot
Skid – Ammonia Blower Injection Foundation and Connections	1 Lot
Tank – Ammonia Storage, Foundation and Connections	1 Lot
Tank – Recycled/Raw Water, Foundation and Connections	1
Tank – Fire Water, Foundation and Connections	1
Tank – Oily Water Separator, Foundation and Connections	1 Lot
Tank – Service Water Foundation and Connections	1
Tank – Condensate Surge, Foundation and Connections	1
Tank – Demineralized Water, Foundation and Connections	2
Tank – Boiler Blowdown, Foundation and Connections	1 Lot
Tank – Water Treatment Facilities Foundation and Connections (as	1 Lot

Equipment/System	Quantity (Plant)
required by CBC)	
Pump – Diesel Fire Water Pump Skid Foundation and Connections	1
Pump – HSRG Feedwater Foundation and Connections	1 Lot
Pump – Boiler Water Feed Pump Foundation and Connections	1 Lot
Pump – Demineralized Water Transfer Pump Foundation and Connections	1 Lot
Pump – Recycled Water Shipping Pump Station, Foundations and Connections	1 Lot
Pump – Raw Water Pump Station, Foundations and Connections	1 Lot
Pump – Condensate Pump Foundation and Connections	1 Lot
Pump – Auxiliary Cooling Water	1 Lot
Pump – Circulating Cooling Water Foundation and Connections	1 Lot
Pumps – Water Treatment and Cooling Systems Foundation and Connections (as required by CBC)	1 Lot
Cooling Tower – Mechanical Draft Evaporative Structure, Foundation and Connections	1 Lot
Boiler – Auxiliary, Stack, Foundation and Connections	1 Lot
Auxiliary Boiler SCR System Foundation and Connections	1 Lot
Ammonia Injection Skid Foundation and Connections	1 Lot
Compressors – Air Foundation(s) and Connections	1 Lot
Compressors – Fuel Gas Foundation(s) and Connections	1 Lot
Pipeline – Natural Gas	1
Pipeline – Recycled Water	1
Pipeline – Waste Water	1
Pipeline – Potable Water	1
Potable Water Systems	1 Lot
Chemical Containment Systems	1 Lot
Fire Suppression Systems	1 Lot
Drainage Systems (including sanitary, storm drain, and waste)	1 Lot
Roadways and Retaining Walls	1 Lot
Storm Water Retention Basin	1 Lot
Building Energy Conservation Systems	1 Lot
Temperature Control and Ventilation Systems (including water and sewer connections)	1 Lot
High Pressure Piping	1 Lot
HVAC and Refrigeration Systems	1 Lot

GEN-3 The project owner shall make payments to the CBO for design review, plan check and construction inspection based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with 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], adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be as otherwise agreed by the project owner and the CBO.

Verification: The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project

owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fees have 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 (Cal. Code Regs., tit. 24, § 4-209, Designation of Responsibilities)]. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

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

The RE shall:

1. Monitor construction progress of work requiring CBO design review and inspection to ensure compliance with LORS;
2. Ensure that construction of all the facilities subject to CBO design review and inspection 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 the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

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

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

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

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

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all responsible engineers assigned to the project [1998 CBC, Section 104.2, Powers and Duties of Building Official].

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A: The civil engineer shall:

1. Design, or be responsible for design, stamp, and sign all plans, calculations and specifications for proposed site work, civil works and related facilities requiring design review and inspection by the CBO. At

a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads and sanitary sewer systems; and

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.

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].

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

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 Energy Commission's Decision.

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 30 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, resumes 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 resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, 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. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;
2. 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, then, if uncorrected, to the CBO and the CPM for corrective action [1998 CBC, Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]; 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 certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

Verification: At least 15 days (or project owner and CBO approved alternative timeframe) prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.

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

GEN-7 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend the corrective action required [1998 CBC, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The discrepancy documentation shall 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 transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next Monthly Compliance Report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. 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]. The project owner shall retain one set of approved engineering plans, specifications and calculations at the project site or at another accessible location during the operating life of the project [1998 CBC, Section 106.4.2, Retention of Plans].

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

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

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils 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 (or project owner and CBO approved alternative timeframe) prior to the start of site grading the project owner shall submit the documents described above to the CBO for design review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible 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 24 hours, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within 24 hours of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

CIVIL-3 The project owner shall perform inspections in accordance with the 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 for which a grading permit is required shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be

reported immediately to the resident engineer, the CBO and the CPM [1998 CBC, Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. 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 five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a Non-Conformance Report (NCR) and the proposed corrective action. 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. The project owner shall 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 of any major structure or component listed in **Table 1** of Condition of Certification **GEN-2**, above, the project owner shall submit to the CBO for design review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for the following items (from **Table 1**, above):

1. Major project structures;

2. Major foundations, equipment supports and anchorage;

3. Large field fabricated tanks;

4. Turbine/generator pedestal; and
5. Switchyard structures.

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

The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (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 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) 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 days (or project owner and CBO approved alternative timeframe) prior to the start of any increment of construction of any structure or component listed in Table 1 of Condition of Certification GEN-2 above, the project owner shall submit to the CBO, with a copy to the CPM, 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 Energy Commission's Decision.

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 non-conforming submittal with a copy of the transmittal letter 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 engineering LORS.

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

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

3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and
5. Reports covering other structural activities requiring special inspections shall be in accordance with the 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 five 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 [1998 CBC, Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]. The NCR shall reference the Condition(s) of Certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

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

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 1998 CBC, Chapter 1, Section 106.3.2, Submittal documents and Section 106.3.3, Information on plans and specifications, including 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, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the Monthly Compliance Report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in 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.

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

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

MECH-1 The project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in Table 1, Condition of Certification GEN 2, above. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 106.3.2, Submittal Documents; Section 108.3, Inspection Requests; Section 108.4, Approval Required; 1998 California Plumbing Code, Section 103.5.4, Inspection Request; Section 301.1.1, Approval].

The responsible mechanical engineer shall stamp and sign all plans, drawings and calculations for the major piping and plumbing systems subject to the CBO design review and approval, and submit a signed statement to the CBO when the said proposed piping and plumbing systems have been designed, fabricated and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards [Section 106.3.4, Architect or Engineer of Record], which may include, but not be limited to:

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

The CBO may deputize inspectors to carry out the functions of the code enforcement agency [1998 CBC, Section 104.2.2, Deputies].

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of any increment of major piping or plumbing construction listed in Table 1, Condition of Certification GEN-2 above, the project owner shall submit to the CBO for design review and approval the final plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable LORS, and

shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

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

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by 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].

The project owner shall:

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

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

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

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

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

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include

approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS [1998 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record].

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

ELEC-1 Prior to the start of any increment of electrical construction for electrical equipment and systems 480 volts and higher, listed below, with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations [CBC 1998, Section 106.3.2, Submittal documents]. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [1998 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

A. Final plant design plans to include:
   1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems; and
   2. system grounding drawings.

B. Final plant calculations 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; and
   7 lighting energy calculations.

C. The following activities shall be reported to the CPM in the Monthly Compliance Report:
   1. Receipt or delay of major electrical equipment;

2. Testing or energization of major electrical equipment; and
3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission Decision.

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

REFERENCES

Calpine (Calpine Corporation/Hatfield). 2001a. Submittal of Application for Certification. Submitted to the California Energy Commission, August 17, 2001.

Calpine (Calpine Corporation). 2001b. Decision to eliminate the 14.8 mile northern gas pipeline route (Alternative B) at this time. Submitted to the California Energy Commission, September 20, 2001.

Riverside (County of Riverside/Buster). 2002a. Response to CEC request for input in IEEC and LORS (local land use laws, ordinances, regulations and standards). Submitted to the California Energy Commission, March 13, 2002.

Wood, W. 2002 a. California Energy Commission staff. Telephone conversation with Brian Payne, California Energy Commission staff, April 16, 2002.

GEOLOGY, MINERAL RESOURCES, AND PALEONTOLOGY

Dal Hunter, Ph.D., C.E.G.

INTRODUCTION

In the geology, mineral resources, and paleontology section, staff discusses potential impacts of the proposed Inland Empire Energy Center (IEEC) project regarding geologic hazards, geologic (including mineralogic) resources, and paleontologic resources. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to significant geological and paleontological resources during project construction, operation and closure. A brief geological and paleontological overview of the project is provided. The section concludes with staff's proposed monitoring and mitigation measures with respect to geologic hazards and geologic, mineralogic, and paleontologic resources, with the inclusion of Conditions of Certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The applicable LORS are listed in the Application for Certification (AFC), in Section 6.0, Table 6.1-1 of the AFC (Calpine, 2001a). The following is a brief description of the LORS for geologic hazards and resources, and paleontologic resources.

FEDERAL

The proposed IEEC is not located on federal land. There are no federal LORS for geological hazards and resources or grading for the proposed project. The Federal Antiquities Act of 1906, in part, protects paleontological resources from vandalism and unauthorized collection on federal land (PL 59-209; 16 United States Code section 431 et seq.; 34 Stat. 25). The National Environmental Policy Act (NEPA) of 1969, as amended, requires analysis of potential environmental impacts to important historic, cultural and natural aspects of our national heritage (United States Code, section 4321 et seq.; 40 Code of Federal Regulations, section 1502.25).

STATE AND LOCAL

The California Building Code (CBC) 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 project investigation, design (Chapters 16 and 18) and construction (including grading and erosion control as found in Appendix Chapter 33). The CBC supplements the UBC's grading and construction ordinances and regulations (California Building Standards Commission [CBSC]), 1998.

The California Environmental Quality Act 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 geologic hazards.

- Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

The "Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures" (SVP, 1995) is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. They were adopted in October 1995 by the Society of Vertebrate Paleontologists (SVP), a national organization.

ENVIRONMENTAL SETTING

The proposed IEEC is located within the Peninsular Ranges geomorphic province at the southern end of the Perris Valley, Riverside County, California. This area within the Peninsular Ranges is characterized by unnamed mountains to the west and the Lakeview Mountains to the east and consists of a broad, nearly flat plain. Major geologic units in the vicinity of the site include Mesozoic metamorphic rocks, Cretaceous granite, granodiorite and gabbro, Quaternary alluvial deposits, and surficial soil. The Mesozoic metamorphic rocks consist of quartzite, phyllites, and metasediments. The Quaternary alluvial deposits consist of alluvial fan and flood plain deposits. The surficial soil consists of silty, fine to coarse sand.

Exploration at the site by the applicant generally encountered a surficial light brown, dense to very dense, silty sand overlying alluvium. The alluvium consists of brown to reddish brown, hard to very dense, variable silty sand, sandy silt, sandy lean clay, and clayey sand layers. The surficial silty sand has a thicknesses of approximately 1 foot to 3-1/2 feet. The alluvium was encountered to 100 feet, the maximum depth of exploration (URS, 2000).

ANALYSIS AND IMPACTS

There are two types of impacts considered in this section. The first are geologic hazards, which could impact proper functioning of the proposed facility and include faulting and seismicity, liquefaction, dynamic compaction, hydrocompaction, subsidence, expansive soils, landslides, and tsunamis and seiches. The second considers potential impacts the proposed facility could have on existing geologic, mineralogic, and paleontologic resources in the area.

STAFF'S CRITERIA FOR DETERMINING IMPACT SIGNIFICANCE

There are no federal LORS with respect to geologic hazards and geologic and mineralogic resources; however, the California Building Code (CBC) provides geotechnical and geological investigation and design guidelines which engineers must adhere to when designing a proposed facility. As a result, the criteria used to assess geologic hazard impact significance includes evaluating each potential hazard in relation to being able to adequately design and construct the proposed facility.

With respect to impacts the proposed facility may have on existing geologic and mineralogic resources, geologic and mineral resource maps for the surrounding area are reviewed in addition to any site-specific information provided by the applicant to

determine if geologic and mineralogic resources are present in the area. If present, operating procedures of the proposed facility, in particular ground water extraction and mass grading operations, are reviewed to determine if such operations could adversely impact such resources.

The Federal Antiquities Act, in part, protects paleontologic resources from vandalism and unauthorized collection on federal land. NEPA requires analysis of potential environmental impacts to important historic, cultural and natural aspects of our national heritage. Based on these policies, staff reviews existing paleontologic information for the surrounding area, as well as any site-specific information provided by the applicant, in accordance with accepted assessment protocol (SVP, 1995) to determine if there are any known paleontologic resources in the general area. If present or likely to exist, Conditions of Certification are applied to project approval, which outline procedures required during construction to mitigate impacts to potential resources.

GEOLOGIC HAZARDS

Detailed geological discussion and information about the project's linear facilities was not included in the AFC (CALPINE, 2001a). However, given the geology and borings present at the site, the potential for these geologic hazards along the linear facilities is low. In order to accurately assess the potential for liquefaction, dynamic compaction, hydrocompaction, subsidence, and expansive soils along the linear facilities, subsurface exploration and associated laboratory testing and analyses should be performed during the design-level geotechnical investigation. There are no current standards that require linear facilities to be designed to resist fault rupture or liquefaction, even when these facilities cross an active fault (Anderson, 2001)

Faulting and Seismicity

Energy Commission staff reviewed the California Division of Mines and Geology (CDMG) publication Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions, dated 1994 (CDMG, 1994), Geologic Map of California – Santa Ana Sheet (Rogers, 1965), Alquist-Priolo Zones (CDMG, 2000), Geology of the Lakeview-Perris Quadrangles (Morton, 1972), Geologic Map of the Romoland 7.5-minute Quadrangle (Morton, 1991), and Maps of Known Active Fault Near-source Zones in California and Adjacent Parts of Nevada (ICBO, 1998). The project is located within Seismic Zone 4 as delineated on Figure 16-2 of the CBC. The closest known active fault is the San Jacinto (San Jacinto Valley segment) Fault, located approximately 10.5 miles northeast of the site. CEC staff has calculated an estimated deterministic peak horizontal ground acceleration for the project on the order of 0.22g. This estimate is based upon a moment magnitude 6.9 earthquake on the San Jacinto (San Jacinto Valley segment) Fault. A second active fault, the San Jacinto (Anza segment) Fault, is located 14 miles to the east. Staff has calculated an estimated deterministic peak ground acceleration for the San Jacinto (Anza segment) Fault on the order of 0.21g. This estimate is based on a moment magnitude 7.2 earthquake on the San Jacinto (Anza segment) Fault. Other active faults within the vicinity of the site, include the Elsinore (Glen-Ivy and Julian segments) and the San Andreas (Southern segment) Faults. The CBC designates a design ground acceleration of 0.4g for the entire project. The closest pre-Holocene fault is located approximately 2.5 miles south of the site (Morton, 1991).

Liquefaction

Liquefaction is a nearly complete loss of soil shear strength that can occur during a seismic event. During the seismic event, cyclic shear stresses cause the development of excessive pore water pressure between the soil grains, effectively reducing the internal strength of the soil. This phenomenon is generally limited to unconsolidated, clean to silty sand (up to 35 percent non-plastic fines) and very soft silts lying below the ground water table. The higher the ground acceleration caused by a seismic event, the more likely liquefaction is to occur. Severe liquefaction can result in catastrophic settlements of overlying structural improvements and lateral spreading of the liquefied layer when confined vertically but not horizontally. Since the site is underlain by hard sandy silts and very dense silty sands, and the depth to ground water is approximately 78.5 feet, the potential for liquefaction is negligible.

Dynamic Compaction

Dynamic compaction of soils results when relatively unconsolidated granular materials experience vibration associated with seismic events. The vibration causes a decrease in soil volume, as the soil grains tend to rearrange into a more dense state (an increase in soil density). The decrease in volume can result in settlement of overlying structural improvements. Since the site is generally underlain by dense silty sand and hard silt soils, the potential for dynamic compaction is negligible.

Hydrocompaction

Partially saturated soils can possess bonds that are a result of chemical precipitates that accumulate under semi-arid conditions. Such soluble compound bonds provide the soils with cohesion and rigidity; however, these bonds can be destroyed upon wetting. When destroyed, a substantial decrease in the material's void ratio is experienced even though the vertical pressure does not change. Materials that exhibit this decrease in void ratio and corresponding decrease in volume with the addition of water are defined as collapsible soils. Collapsible soils are typically limited to true loess, fine flash flood deposits, clayey loose sands, loose sands cemented by soluble salts, and windblown silts. Since the site is underlain by very dense soils, the potential for hydrocompaction is negligible.

Subsidence

Ground subsidence is typically caused when ground water is pumped out of a sedimentary basin for irrigation or municipal use faster than the natural recharge rate. Since the IEEC will obtain recycled water from the Eastern Municipal Water District via a new recycled water pipeline to the site, significant draw down of the water table due to IEEC operations is not anticipated. As a result, the potential for ground subsidence due to IEEC is considered low.

Expansive Soils

Soil expansion occurs when clay-rich soils, with an affinity for water, exist in-place at a moisture content below their plastic limit. The addition of moisture from irrigation, capillary tension, water line breaks, etc. causes the clay soils to collect water molecules in their structure, which in turn, causes an increase in the overall volume of the soil. This increase in volume can correspond to movement of overlying structural improvements. As reported in the test pit and boring logs, the site generally is underlain

by silty sand, clayey sand, and sandy silt soils (URS, 2000). A low potential for expansion may be present in the clayey sand soils.

Landslides

Landslides typically involve rotational slump failures within surficial soils/colluvium and/or weakened bedrock that are usually implemented by an increase of the material's moisture content above a layer which exhibits a relatively low strength. Debris-flows are shallow landslides that travel downslope very rapidly as muddy slurry. Since the site, transmission line, gas line, and wastewater pipeline areas are generally topographically flat, the potential for landslides is negligible.

Tsunamis and Seiches

Tsunamis and seiches are earthquake-induced waves that inundate low-lying areas adjacent to large bodies of water. The proposed site is situated approximately 1,436 feet above mean sea level and no large bodies of water are present near the IEEC site. As a result, the potential for tsunamis and seiches to affect the site is considered negligible.

GEOLOGIC, MINERALOGIC, AND PALEONTOLOGIC RESOURCES

Energy Commission staff have reviewed applicable geologic maps and reports for this area (Larose et al., 1999; DOGGR, 1982; Saul et al., 1968). Based on this information and the information contained in the AFC (Calpine, 2001a), there are no known geologic or mineralogic resources located at or immediately adjacent to the proposed IEEC site. The applicant's consultant conducted a paleontologic resources field survey and a sensitivity analysis for the proposed IEEC and the proposed linear facility improvements to support the IEEC. No significant fossil localities were identified at the IEEC site or associated linear facilities. Surficial geologic units were assigned a "very low" sensitivity rating with respect to potentially containing paleontological resources. The underlying older alluvium, which is thought to be at least 10 feet deep, was assigned a "low sensitivity" rating. These conclusions are consistent with those determined by the County of Riverside in an environmental impact report for the area (County of Riverside, 1994). Staff asked the San Bernadino County Museum (SBCM) for a literature review and check of the Regional Paleontologic Locality Inventory (RPLI). In a letter dated May 1, 2002, SBCM verified that there are no known paleontologic resources on the site but identified several vertebrate fossil sites within 2 miles of the project, including remains of an extinct camel. The letter stated: "The results of the literature review and the check of the RPLI at the SBCM demonstrate that excavation in conjunction with development is determined to have high potential to adversely impact significant non-renewable paleontologic resources present within the boundaries of the proposed Inland Empire Energy Center, LLC property." The letter then discusses appropriate mitigation, which is in general agreement with the Conditions of Certification presented here. Based on review of available information, staff concludes that the proposed IECC project has moderate to high potential to contain significant paleontologic resources, particularly at, but not limited to, depths below 10 feet.

PROJECT SPECIFIC IMPACTS

Seismicity represents the main geologic hazard at this site. No geologic or mineralogic resources are known to exist in the area and the (confidential) Paleontologic Resources

Report (URS, 2001a) assigns a sensitivity rating of low for all geologic units, which underlie the proposed facility and associated linears. Conditions of Certification **GEN-1**, **GEN-5**, **CIVIL-1** (in the **Facility Design** section of this PSA) should mitigate any potential hazards discussed above to a less than significant level, and Conditions of Certification and **PAL-1** to **PAL-7** should mitigate any impacts to paleontologic resources to a less than significant level.

CUMULATIVE IMPACTS

The IECC site lies in an area that exhibits minor geologic hazards and no known geologic or mineralogic resources. Based on this information and the proposed Conditions of Certification to mitigate potential project specific impacts, it is staff's opinion that the potential for significant adverse cumulative impacts to the project from geologic hazards, and to potential geologic, mineralogic, and paleontologic resources from the proposed project, is low.

FACILITY CLOSURE

A definition and general approach to closure is presented in the **General Conditions** section of this assessment. Facility closure activities are not anticipated to impact geologic, mineralogic, or paleontologic resources. This is due to the fact that no such resources are known to exist at the proposed project site. In addition, decommissioning and closure of the power plant should not negatively affect geologic, mineralogic, or paleontologic resources since the majority of the ground disturbed in plant decommissioning and closure will have been disturbed during construction and operation of the facility.

RESPONSE TO PUBLIC AND AGENCY COMMENT

Staff has not received comments regarding geology, paleontology or surface water from the public at this time. The County of Riverside issued a letter on March 5, 2002, recommending conditions that the IEEC would need to meet in order to obtain a Conditional Use Permit from the County of Riverside, if the project were not under the Energy Commission's jurisdiction (Riverside, 2002a). These requirements were addressed separately for the main plant site and the natural gas compressor site. In general these conditions recommend the geotechnical investigation report be submitted to the Riverside County Geologist and to the Grading Division of the Riverside County Building and Safety Department, prior to issuance of a grading permit. These conditions are presented below:

County projects typically require that geotechnical/soils reports be submitted to the County Geologist for approval prior to issuance of a grading permit. All grading shall be in conformance with the recommendations of the geotechnical/soils reports reviewed by Riverside County. The geotechnical/soils, compaction and inspection reports will be reviewed in accordance with the Riverside County Geotechnical Guidelines for Review of Geotechnical and Geologic Reports. A pregrading meeting, certifications, approvals and inspection procedures will be implemented per the County of Riverside Department of Building and Safety grading and inspection process. All grading shall be in

conformance with the recommendations of the geotechnical/soils reports reviewed by Riverside County.

A project geotechnical report is required by the CBC and the Conditions of Certification (**GEN- 1, GEN-5,** and **CIVIL-1**) of this document. Riverside County, however, will review the geotechnical report in accordance with a specific set of technical guidelines (Riverside, 2000a). Staff review of these guidelines, and the preliminary geotechnical investigation submitted by the applicant, suggests that additional project-specific discussion and recommendations would be required in the final, design-level, geotechnical investigation, if the project was under the jurisdiction of Riverside County.

CONCLUSIONS AND RECOMMENDATIONS

The applicant will likely be able to comply with all applicable LORS. The project should have no adverse impact with respect to design and construction of the project, and geologic or mineralogic resources. Staff proposes to ensure compliance with applicable LORS and protection of potential paleontologic resources with the adoption of the proposed Conditions of Certification listed below.

PROPOSED CONDITIONS OF CERTIFICATION

General Conditions of Certification with respect to Geology are covered under Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the **Facility Design** section. Conditions of Certification for Paleontology are as follows:

PAL-1 The project owner shall provide the CPM with the resume and qualifications of its Paleontological Resource Specialist (PRS) and Paleontological Resource Monitors (PRMs) for review and approval. If the approved PRS or one of the PRMs is replaced prior to completion of project mitigation and report, the project owner shall obtain CPM approval of the replacement.

The resume shall include the names and phone numbers of contacts. The resume shall also demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontologists (SVP) guidelines of 1995. The experience of the PRS shall include the following:

1) institutional affiliations or appropriate credentials and college degree;

2) ability to recognize and recover fossils in the field;

3) local geological and biostratigraphic expertise;

4) proficiency in identifying vertebrate and invertebrate fossils;

5) publications in scientific journals; and

6) the PRS shall have at least three years of paleontological resource mitigation and field experience in California, and at least one year of experience leading paleontological resource mitigation and field activities.

The PRS shall obtain qualified paleontological resource monitors to monitor as necessary on the project. Paleontologic resource monitors (PRMs) shall have the equivalent of the following qualifications:

1) BS or BA degree in geology or paleontology and one year experience monitoring in California; or

2) AS or AA in geology, paleontology or biology and four years experience monitoring in California; or

3) Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

Verification: At least 60 days prior to the start of ground disturbance, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.

At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project and stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM for approval. The letter shall be provided to the CPM no later than one week prior to the monitor beginning on-site duties.

Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

PAL-2 The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant and all linear facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and the plan and profile drawings for the utility lines would normally be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and can be 1 inch = 40 feet to 1 inch = 100 feet range. If the footprint of the power plant or linear facility changes, the project owner shall provide maps and drawings reflecting these changes to the PRS and CPM.

if construction of the project will proceed in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Prior

to work commencing on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the PRS shall consult weekly with the project superintendent or construction field manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall provide the maps and drawings.

If there are changes to the footprint of the project, revised maps and drawings shall be provided at least 15 days prior to the start of ground disturbance.

If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within 5 days of identifying the changes.

PAL-3 The PRS shall prepare, and the project owner shall submit to the CPM for review and approval, a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting and sampling activities and may be modified with CPM approval. This document shall be used as a basis for discussion in the event that on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of the Vertebrate Paleontologists (SVP, 1995) and shall include, but not be limited to, the following:

1) Assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation will be performed according to the PRMMP procedures;
2) Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and all conditions for certification;
3) A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;
4) An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained beds;

5) A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed schedule for the monitoring;

6) A discussion of the procedures to be followed in the event of a significant fossil discovery, including notifications;

7) 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;

8) Procedures for 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

9) Identification of the institution that has agreed to receive any data and fossil materials recovered, requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution; and,

10) A copy of the paleontological conditions of certification.

Verification: At least thirty (30) days prior to ground disturbance, the project owner shall provide a copy of the PRMMP. The PRMMP shall include an affidavit of authorship by the PRS, and acceptance of the project owner evidenced by a signature.

PAL-4 Prior to ground disturbance and for the duration of construction, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for all project managers, construction supervisors and workers who operate ground disturbing equipment or tools. Workers to be involved in ground disturbing activities in sensitive units shall not operate equipment prior to receiving worker training. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

The Worker Environmental Awareness Program (WEAP) shall address 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. In-person training shall be provided for each new employee involved with ground disturbing activities, while these activities are occurring in highly sensitive geologic units, as detailed in the PRMMP. The in-person training shall occur within four days following a new hire for highly sensitive sites and as established by the PRMMP for sites of moderate, low, and zero sensitivity. Provisions will be made to provide the WEAP training to workers not fluent in English.

The training shall include:

1) A discussion of applicable laws and penalties under the law;

2) For training in locations of high sensitivity, the PRS shall provide good quality photographs or physical examples of vertebrate fossils that may be expected in the area;

3) Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;

4) Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;

5) An informational brochure that identifies reporting procedures in the event of a discovery;

6 A Certification of Completion of WEAP form signed by each worker indicating that they have received the training; and

7) A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification: At least 30 days prior to ground disturbance, the project owner shall submit the proposed WEAP including the brochure with the set of reporting procedures the workers are to follow.

At least 30 days prior to ground disturbance, the project owner shall submit the script and final video to the CPM for approval if the project owner is planning on using a video for interim training.

If an alternate paleontological trainer is requested by the owner, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval. Alternate trainers shall not conduct training prior to CPM authorization.

The project owner shall provide in the Monthly Compliance Report the WEAP copies of the Certification of Completion forms with the names of those trained and the trainer for each training offered that month. The Monthly Compliance Report shall also include a running total of all persons who have completed the training to date.

PAL-5 The PRS and PRM(s) shall monitor consistent with the PRMMP, all construction-related grading, excavation, trenching, and augering in areas where potentially fossil-bearing materials have been identified. In the event that the PRS determines full time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the PRS shall notify and seek the concurrence of the CPM.

The PRS and PRM(s) shall have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1) Any change of monitoring different from the accepted schedule presented in the PRMMP shall be proposed in a letter from the PRS and the project owner to the CPM prior to the change in monitoring. The letter shall include the justification for the change in monitoring and submitted to the CPM for review and approval.

2) PRM(s) shall keep a daily log of monitoring of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.

3) The PRS shall immediately notify the project owner and the CPM of any incidents of non-compliance with any paleontological resources conditions of certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.

4) For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM immediately (no later than the following morning after the find, or Monday morning in the case of a weekend) of any halt of construction activities.

Verification: The PRS shall prepare a summary of the monitoring and other paleontological activities that will be placed in the Monthly Compliance Reports. The summary will include the name(s) of PRS or monitor(s) active during the month; general descriptions of training and construction activities and general locations of excavations, grading, etc. A section of the report will include the geologic units or subunits encountered; descriptions of sampling within each unit; and a list of fossils identified in the field. A final section of the report will address any issues or concerns about the project relating to paleontologic monitoring including any incidents of non-compliance and any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the project shall include a justification in summary as to why monitoring was not conducted.

The PRS shall submit the summary of monitoring and paleontological activities in the Monthly Compliance Report.

PAL-6 The project owner, through the designated PRS, shall ensure the recovery, preparation for analysis, analysis, identification and inventory, the 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 their compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved PRR. The project owner shall be responsible to pay curation fees for fossils collected and curated as a result of paleontological monitoring and mitigation.

PAL-7 The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following

completion of the ground disturbing activities. The PRR shall include an analysis of the recovered fossil materials and related information and submitted to the CPM for review and approval.

Verification: The report shall include, but not be limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated.

Within ninety (90) days after completion of ground disturbing activities, including landscaping, the project owner shall submit the Paleontological Resources Report under confidential cover.

Certification of Completion of Worker
Environmental Awareness Program
INLAND EMPIRE ENERGY CENTER (01-AFC-17)

This is to certify these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on Cultural, Paleontology and Biology Resources for all personnel (i.e. construction supervisors, crews and plant operators) working on-site or at related facilities. By signing below, the participant indicates that they understand and shall abide by the guidelines set forth in the Program materials. Please include this completed form in your Monthly Compliance Report.

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Cul Trainer: _____ Signature:_____ Date: ___/___/____

PaleoTrainer: _____ Signature:_____ Date: ___/___/____

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POWER PLANT EFFICIENCY

Brian Payne

INTRODUCTION

The Energy Commission makes findings as to whether energy use by the Inland Empire Energy Center (IEEC) will result in significant adverse impacts on the environment, as defined in the California Environmental Quality Act (CEQA). If the Energy Commission finds that the IEEC's consumption of energy creates a significant adverse impact, it must determine whether there are any feasible mitigation measures that could eliminate or minimize the impacts. In this analysis, staff addresses the issue of inefficient and unnecessary consumption of energy.

In order to support the Energy Commission's findings, this analysis will:

- determine whether the facility will likely present any adverse impacts upon energy resources;
- determine whether these adverse impacts are significant; and if so,
- determine whether feasible mitigation measures exist that would eliminate the adverse impacts, or reduce them to a level of insignificance.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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.

SETTING

Calpine proposes to construct and operate the 670 MW (nominal gross output) combined cycle merchant IEEC power plant to generate baseload and load following power, selling energy to the power market (Calpine 2001a, §§ 1.1, 1.2, and 3.4.2). (This nominal rating is based upon preliminary design information and generating equipment manufacturers' guarantees. The project's actual maximum generating capacity may differ from this figure.) The IEEC is expected to consist of two General Electric (GE) Power Systems PG7251(FB) "F" class combustion turbine generators with inlet air fogging systems producing approximately 174 MW each, two three-pressure heat recovery steam generators (HRSGs) with duct burners, and one single three-pressure, reheat, condensing steam turbine generator producing approximately 204 MW, arranged in a two-on-one combined cycle train, totaling approximately 670 MW. The gas turbines and HRSGs will be equipped with dry low-NOx combustors, selective catalytic reduction (SCR), and an oxidation catalyst to control air emissions (Calpine 2001a, §§ 3.4.2, 3.4.3, 3.4.3.1, 3.4.3.2, 3.4.3.3, and 3.4.12).

Natural gas will be delivered from the existing Sempra Energy transmission pipeline via a new 20 inch diameter, 0.9 mile pipeline connection (Calpine 2001a, §§ 1.5.4, 3.4.8, 3.7.2, 3.10.3 and Calpine 2001b).

Power from the IEEC will be transmitted to the existing Southern California Edison (SCE) Valley Substation via a new 0.9 mile, 500-kV transmission line (Calpine 2001a, §§ 1.5.5 and 3.4.5).

ANALYSIS

ADVERSE IMPACTS ON ENERGY RESOURCES

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient and unnecessary consumption of fuel or energy.

Project Energy Requirements And Energy Use Efficiency

Any power plant large enough to fall under Energy Commission siting jurisdiction will consume large amounts of energy. The IEEC will burn natural gas under base load (538 MW) and peak load (670 MW) at rates of 77.9 billion Btu per day and 103.6 billion Btu per day lower heating value (LHV) respectively (Calpine 2001a, § 3.4.2). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies. Under expected project conditions, electricity will be generated at a base load efficiency of approximately 56.5 percent lower heating value (LHV); at ambient conditions, when duct firing is added, the overall plant efficiency decreases to

approximately 53.2 percent LHV (FWEC 2002c); compare this to the average fuel efficiency of a typical existing utility company baseload power plant at approximately 35 percent LHV.

Adverse Effects On Energy Supplies And Resources

The IEEC will burn natural gas from the existing Sempra Energy system. Gas will be transmitted to the plant via a new 20 inch diameter, 0.9 mile pipeline connection to an existing Sempra Energy natural gas transmission line (Calpine 2001a, §§ 1.5.4, 3.4.8, 3.7.2, and 3.10.3 and Calpine 2001b).

This Sempra Energy intrastate natural gas transmission system transports natural gas from the Blythe area to San Diego area markets. According to Commission forecasts, there is a potential for very large natural gas demands to develop in the San Diego area and northern Mexico. Based on the Commission's modeling, there appears to be sufficient capacity to distribute natural gas throughout these markets via Sempra Energy's intrastate transmission system. However, there is insufficient interstate natural gas pipeline capacity to transport inexpensive natural gas into the region. Specifically, there appears to be sufficient capacity to transport natural gas into these markets from West Texas; but this gas is relatively costly. There is insufficient capacity to transport inexpensive natural gas from the Four Corners and Rocky Mountain regions into these markets. A new, interstate, natural gas transmission line is needed to meet these needs. For the next few years, the supplies appear to be adequate to supply the IEEC. Beyond this time frame, a new interstate transmission line will likely be needed to supply these markets with inexpensive natural gas (Wood 2002a, pers. comm.). Staff believes that free market forces will work to ensure that a new interstate natural gas transport system is constructed, or some other means are developed to provide natural gas to the IEEC and San Diego area.

Additional Energy Supply Requirements

As noted above, in the coming years, a new interstate natural gas transmission pipeline from desirable production areas, or possibly LNG delivered from Baja California, will likely be required to meet regional energy needs.

Compliance With Energy Standards

No standards apply to the efficiency of the IEEC or other non-cogeneration projects.

Alternatives To Reduce Wasteful, Inefficient And Unnecessary Energy Consumption

The IEEC could be deemed to create significant adverse impacts on energy resources if alternatives existed that would reduce the project's use of fuel. Evaluation of alternatives to the project that could reduce wasteful, inefficient or unnecessary energy consumption first requires examination of the project's energy consumption. Project fuel efficiency, and therefore its rate of energy consumption, is determined by the configuration of the power producing system and by the selection of equipment used to generate power.

Project Configuration

The IEEC will be configured as a combined cycle power plant, in which electricity is generated by two gas turbines, and additionally by a reheat steam turbine that operates

on heat energy recuperated from the gas turbines' exhaust (Calpine 2001a, §§ 1.5.2 and 3.4.2). By recovering this heat, which would otherwise be lost up the exhaust stacks, the efficiency of any combined cycle power plant is increased considerably from that of either gas turbines or steam turbines operating alone. Such a configuration is well suited to the large, steady loads met by a baseload plant, intended to supply energy efficiently for long periods of time.

Calpine proposes to use inlet air foggers, HRSG duct burners (re-heaters), three-pressure HRSGs, a steam turbine unit, and circulating water system (Calpine 2001a, § 3.4.2). Staff believes these features contribute to meaningful efficiency enhancement to the IEEC. The two-train CT/HRSG configuration also allows for high efficiency during unit turndown because one CT can be shut down, leaving one fully loaded, efficiently operating CT.

Duct Burners

While duct burners are commonly employed in combined cycle power plants, the IEEC presents a new approach to the use of duct burners. As the gas turbine's hot exhaust gases flow into the HRSG through the transition duct, a nozzle arrangement injects more natural gas fuel into the gas stream. The additional fuel burns, adding heat to the gas stream. This increased heat can serve several purposes. It ensures that the steam produced for the steam turbine is sufficiently hot to provide optimum steam turbine performance; it can produce additional steam for injection into the gas turbine, increasing the gas turbine's power output; and it can produce still more steam to drive an even larger steam turbine. Another valuable feature of duct burners is their contribution to flexibility; while a modern clean-burning combined cycle operates optimally at steady (baseload) output, the duct burner allows the unit to load follow, throttling up and down in response to system load changes. In the IEEC, the duct burners will perform all these tasks.

In a common combined cycle power plant (represented by Calpine's Metcalf Energy Center project), a pair of F-class gas turbine generators produce 544 MW; the balance of the plant's 600 MW output, or 56 MW, is provided by the duct burners. Thus, about nine percent of the plant's total power output is generated by heat from the duct burners. This is the power equivalent of 1.3 General Electric LM6000 simple cycle peaker gas turbines, currently the most popular gas turbine peaking unit.

Another example of duct burning is Calpine's Delta Energy Center, in which three F-class gas turbine generators produce 816 MW of the plant's 880 MW capacity. The balance, 64 MW, is provided by heat from the duct burners; this represents seven percent of the plant's total output, or the equivalent of 1.5 GE LM6000 simple cycle peakers.

The IEEC, also a Calpine project, represents a wide departure from this norm. The unique feature of the IEEC is that the duct burners are much larger than normal. Complete data were not available to Energy Commission staff for a thorough numerical project efficiency analysis. However, the information provided by the applicant demonstrates the following: The IEEC will operate as a net 538 MW baseload power plant, with an additional 162 to 166 MW of peaking capacity, achieved through the use

of unusually large duct burners (FWEC 2002c). The results of duct burning represents about 23 percent of total power output, or the equivalent of about four GE LM6000 peakers.

The reader should note the relevance of this efficiency comparison with the LM6000 simple cycle peaker. According to data provided by the applicant, while the fuel efficiency of the plant with the duct burners not operating will be 56 percent LHV (representing the state of the art), the incremental fuel efficiency of the IEEC duct burners is approximately 44 percent LHV. This compares closely to the typical fuel efficiency of an LM6000 at 40.2 percent LHV (GTW 2000). From a fuel efficiency standpoint, the IEEC, as proposed, represents a two-on-one combined cycle power plant producing 538 MW, plus four LM6000 simple cycle peakers generating an additional 162 to 166 MW.

It should be noted that this reliance on large duct burners appears to be the beginning of a trend. Calpine has also filed AFCs for the East Altamont Energy Center (01-AFC-4) and the Central Valley Energy Center (01-AFC-22), which both employ these burners. The chief benefits of this configuration involve capital investment; the developer can save substantial money in building the project. Energy Commission staff fully expects Calpine's competitors to consider following this lead in their future designs. This approach, therefore, is not limited to this single project.

Equipment Selection

Modern gas turbines embody the most fuel-efficient electric generating technology available today. Currently available, large combustion turbine models can be grouped into three categories including conventional, advanced and next generation. Advanced combustion turbines offer significant advantages for the IEEC. Their higher firing temperatures offer higher efficiencies than conventional turbines. They offer proven technology with numerous installations and extensive run time in commercial operation. Emission levels are also proven, and guaranteed emission levels have been reduced based on operational experience and design optimization by the manufacturers. In comparison, environmental performance and thermal efficiencies of next generation turbines have not been demonstrated in commercial operation (Calpine 2001a, § 3.10.6.3). Therefore, the IEEC will employ the advanced model turbines instead of the conventional or the next generation models. The F-class gas turbines to be employed in the IEEC represent some of the most modern and efficient such machines now available. The applicant will employ two large advanced model General Electric (GE) Power Systems "F" class combustion turbine generators in a two-on-one combined cycle power train (Calpine 2001a, § 3.4.3.1). This configuration is nominally rated at 530 MW and 56.5 percent efficiency LHV at ISO conditions (GTW 2000).

One possible alternative machine is the Alstom Power ABB KA24, a gas turbine nominally rated at 260 MW with an identical efficiency rating at 56.5 percent LHV at ISO conditions (GTW 2000).

Another alternative is the Siemens Westinghouse 501FD (W501FD) Phase 2 gas turbine generator. This configuration is nominally rated at 550 MW and 55.8 percent efficiency LHV at ISA conditions (GTW 2000).

Any differences among the GE 7FA, ABB KA24, and W501FD in actual operating efficiency will be insignificant. Selecting among these machines is thus based on other factors, such as generating capacity, cost, commercial availability, and ability to meet air pollution limitations. The ABB machine, for instance, is available only in one-on-one power trains, with one gas turbine and one steam turbine paired on a single shaft, generating a nominal 260 MW. The GE and Siemens-Westinghouse machines, which can be configured more flexibly, offer an advantage.

Efficiency Of Alternatives To The Project

The project objectives include generating economical, reliable, and environmentally sound energy for California's electricity market (Calpine 2001a, § 2.1). IEEC proposes to accomplish these objectives by employing the most efficient technologies available today that are feasible for the project. The primary reasons for the applicant's choice of the proposed technologies, in lieu of the alternatives, include higher efficiency, commercial availability, ability to reduce air emissions, desirable generating capacity, flexibility to produce an additional 162 to 166 MW of peaking capacity, and cost. Staff agrees with the applicant that combined cycle technology utilizing F-class CTGs, dry low NOx combustors and SCR, inlet air fogging system, and deaerating surface condenser are the most efficient technologies for large power plants wishing to compete in the power market (Calpine 2001a, § 3.4.2).

Alternative Generating Technologies

Alternative generating technologies for the IEEC are considered in the AFC (Calpine 2001a, § 3.10.6). Conventional boiler and steam turbine, simple cycle combustion turbine, conventional combined cycle, Kalina combined cycle, advanced combustion turbines, natural gas, coal, oil, solar, wind, hydroelectric, biomass, and geothermal technologies are all considered (Calpine 2001a, §§ 3.10.6.1.1, 3.10.6.1.2, 3.10.6.1.3, 3.10.6.1.4, 3.10.6.1.5, and 3.10.6.2). Given the project objectives, location and air pollution control requirements, staff agrees with the applicant that only natural gas-burning technologies are feasible.

Natural Gas-Burning Technologies

Fuel consumption is one of the most important economic factors in selecting an electric generator; fuel typically accounts for over two-thirds of the total operating costs of a fossil-fired power plant (Power 1994). Under a competitive power market system, where operating costs are critical in determining the competitiveness and profitability of a power plant, the plant owner is thus strongly motivated to purchase fuel-efficient machinery.

Capital cost is also important in selecting generating machinery. Recent progress in the development of large, stationary gas turbines, aided by the incorporation into these machines of technological advances made in the development of aircraft (jet) engines, has created a situation in which several large manufacturers compete vigorously to sell their machines. This, combined with the cost advantages of assembly line manufacturing, has driven down the prices of these machines. Thus, the power plant developer can purchase a turbine generator that not only offers the lowest available fuel costs, but at the same time sells for the lowest per-kilowatt capital cost.

One possible alternative to an F-class gas turbine is a G-class machine, such as the Siemens-Westinghouse 501G gas turbine generator, which employs partial steam cooling to allow slightly higher temperatures, yielding slightly greater efficiency. The 501G is still relatively new; the first such machines only recently began operation at a site in Florida owned by Lakeland Electric and Water, and at PG&E Generating's Millennium project in Charlton, Massachusetts (Power 1999). PG&E National Energy Group is also using three Misubishi Power Systems M501G combined cycle modules at their 1,170 MW merchant plan in Covert Township, Michigan, which is scheduled to begin operation in the summer of 2003 (GTW 2001). The claimed efficiency for this installation is 58.0% LHV. This project is scheduled to begin operation in the summer of 2003. Given the minor efficiency improvement promised by the G-class turbine and the lack of a proven track record for the 501G, the applicant's decision to purchase F-class machines is a reasonable one.

Another possible alternative to the F-class gas turbine is an H-class machine with a claimed fuel efficiency of 60 percent LHV at ISO conditions (GTW 1999b). This high efficiency is achieved through a higher pressure ratio and higher firing temperature, made possible by cooling the initial turbine stages with steam instead of air. The first Frame 7H application is not expected to enter service until the summer of 2002. The first GE Power Systems Frame 9H turbine will be installed at the Baglan Bay Power Station in South Wales. In base load, the plant is expected to be nominally rated at 480 MW, with a reported 60% thermal efficiency capability (GTW 2001). Given the lack of proven performance, staff agrees with the applicant's decision to employ F-class machines.

A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler or fogger, and the chiller; both devices increase power output by cooling the gas turbine inlet air. A mechanical chiller can offer greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An absorption chiller uses less electric power, but necessitates the use of a substantial inventory of ammonia. An evaporative cooler or a fogger boosts power output best on dry days; it uses less electric power than a mechanical chiller, possibly yielding slightly higher operating efficiency. The difference in efficiency among these techniques is relatively insignificant.

The applicant proposes to employ inlet air fogging (Calpine 2001a, §§ 3.4.2 and 3.4.3.1). Given the climate at the project site and the relative lack of clear superiority of one system over the other, staff agrees that the applicant's approach will yield no significant adverse energy impacts.

In conclusion, the project configuration (combined cycle) and generating equipment (F-class gas turbines) chosen appear to represent the most efficient feasible combination to satisfy the project objectives. There are no alternatives that could significantly reduce energy consumption.

CUMULATIVE IMPACTS

There are no nearby power plant projects that hold the potential for cumulative energy consumption impacts when aggregated with the project. Staff knows of no other projects that could result in cumulative energy impacts.

Staff believes that construction and operation of the project will not bring about indirect impacts, in the form of additional fuel consumption, that would not have occurred but for the project. The older, less efficient power plants consume more natural gas to operate than the new, more efficient plants such as the IEEC. Since natural gas will be burned by the power plants that are most competitive on the spot market, the most efficient plants will run the most. The high efficiency of the proposed IEEC should allow it to compete very favorably, running at a high capacity factor, replacing less efficient power generating plants in the market, and therefore not impacting or even reducing the cumulative amount of natural gas consumed for power generation at current energy consumption levels.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, will not influence, nor will it be influenced by, project efficiency. Any efficiency impacts due to closure of the project would be on the electric system as a whole. Yet the vast size of the electric system serving California, the number of generating plants offering to sell power into it, and the existence of the California Independent System Operator to ensure the efficient management of the system, all lend assurance that closure of this facility will not produce significant adverse impacts on efficiency.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The project, if constructed and operated as proposed, would generate electricity at a 538 MW base load efficiency of approximately 56.5 percent LHV; at ambient conditions, when duct firing is added, the overall plant efficiency decreases to approximately 53.2 percent LHV (FWEC 2002c). While it will consume substantial amounts of energy, it will do so in the most efficient manner practicable. The proposed project alone, will not create significant adverse effects on energy supplies or resources, will not require additional sources of energy supply, and will not consume energy in a wasteful or inefficient manner. However, because of cumulative impacts associated with forecast development in the San Diego area and northern Mexico, a new interstate transmission line will likely be needed to supply these markets with inexpensive natural gas. No energy standards apply to the project. Staff therefore concludes that the project would present no significant adverse impacts upon energy resources used for power generation at the current levels of consumption. (See also **Power Plant Reliability**.) Facility closure would not likely present significant impacts on electric system efficiency.

RECOMMENDATION

No Conditions of Certification are proposed.

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POWER PLANT RELIABILITY

Brian Payne

INTRODUCTION

In this analysis, Energy Commission staff addresses the reliability issues of the project to determine if the power plant is likely to be built in accordance with typical industry norms for reliability of power generation. Staff uses this level of reliability as a benchmark because it ensures that the resulting project would likely not degrade the overall reliability of the electric system it serves (see **Setting** below).

The scope of this power plant reliability analysis covers:

- equipment availability;
- plant maintainability;
- fuel and water availability; and
- power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While Calpine Corporation (Calpine) has predicted a 92 to 98 percent availability for the Inland Empire Energy Center (IEEC) (see below), staff believes Calpine should not be held responsible for achieving this goal, so long as the plant's reliability matches or exceeds that of similar plants.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

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 Energy 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)). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if the project exhibits reliability at least equal to that of other power plants on that system (see **Setting** below).

SETTING

In the regulated monopoly electric industry of past decades, the utility companies assured overall system reliability, in part, by maintaining a "reserve margin." This amounted to having on call, at all times, sufficient generating capacity, in the form of standby power plants, to quickly handle unexpected outages of generating or transmission facilities. The utilities generally maintained a seven- to ten-percent reserve margin, meaning that sufficient capacity was on call to quickly replace from seven to ten percent of total system resources. This margin proved adequate, in part because of the reliability of the power plants that constituted the system.

Now, in the restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the California Independent System Operator (Cal-ISO), an entity that purchases, dispatches and sells electric power throughout the state. How Cal-ISO will ensure system reliability is still being determined; protocols are being developed and put in place that will, it is anticipated, allow sufficient reliability to be maintained under the competitive market system. "Must-run" power purchase agreements and "participating generator" agreements are two mechanisms being employed to ensure an adequate supply of reliable power (Mavis 1998, pers. comm.).

The Cal-ISO also requires those power plants selling ancillary services, as well as those holding reliability must-run contracts, to fulfill certain requirements, including:

- filing periodic reports on plant reliability;
- reporting all outages and their causes; and
- scheduling all planned maintenance outages with the Cal-ISO (Detmers 1999, pers. comm.).

The Cal-ISO's mechanisms to ensure adequate power plant reliability apparently have been devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, there is cause to believe that, under free market competition, financial pressures on power plant owners to minimize capital outlays and maintenance expenditures may act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants exhibit individual reliability sufficiently lower than this historical level, the assumptions used by Cal-ISO to ensure system reliability will prove invalid, with potentially disappointing results. Until the restructured competitive electric power system has undergone a shakeout period, and the effects of varying power plant reliability are thoroughly understood and compensated for, staff deems it wise to encourage power plant owners to continue to build and operate their projects to the level of reliability to which all in the industry are accustomed.

Calpine proposes to operate the 670 MW (nominal output) Inland Empire Energy Center (IEEC), selling energy and capacity to the power market (Calpine 2001a, §§ 1.1, 1.2, and 3.4.2). The IEEC will operate as a net 538 MW baseload power plant, with an additional 162 to 166 MW of peaking capacity achieved through the use of unusually large duct burners (see **Power Plant Efficiency**) (FWEC 2002c). The project is expected to operate at an overall availability in the range of 92 to 98 percent (Calpine 2001a, §§ 1.6 and 4.3.1), and at a capacity factor, over the life of the plant, of 25 to 100 percent of base load, in response to customers' demands for electrical power (Calpine 2001a, § 4.3.1).

ANALYSIS

The availability factor for a power plant is the percentage of the time that it is available to generate power; both planned and unplanned outages subtract from its availability. Measures of power plant reliability are based on its actual ability to generate power when it is considered available and are based on starting failures and unplanned, or

forced, outages. For practical purposes, reliability can be considered a combination of these two industry measures, making a reliable power plant one that is available when called upon to operate. Throughout its intended 30-year life (Calpine 2001a, § 4.3.1), the IEEC will be expected to perform reliably. Power plant systems must be able to operate for extended periods without shutting down for maintenance or repairs. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability with scheduled maintenance outages, fuel and water availability, and resistance to natural hazards. Staff examines these factors for the project and compares them to industry norms. If they compare favorably, staff can conclude that the IEEC will be as reliable as other power plants on the electric system, and will therefore not degrade system reliability.

EQUIPMENT AVAILABILITY

Equipment availability will be ensured by use of appropriate quality assurance/ quality control (QA/QC) programs during design, procurement, construction and operation of the plant, and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

Quality Control Program

Calpine describes a QA/QC program (Calpine 2001a, §§ 4.3.5) typical of the power industry. Equipment will be purchased from qualified suppliers, based on technical and commercial evaluations. Suppliers' personnel, production capability, past performance, QA programs and quality history will be evaluated. The project owner will perform receipt inspections, test components, and administer independent testing contracts. Staff expects implementation of this program to yield typical reliability of design and construction. To ensure such implementation, staff has proposed appropriate conditions of certification under the portion of this document entitled **Facility Design**.

PLANT MAINTAINABILITY

Equipment Redundancy

A generating facility called on to operate in baseload service for long periods of time must be capable of being maintained while operating. A typical approach for achieving this is to provide redundant examples of those pieces of equipment most likely to require service or repair.

Calpine plans to provide appropriate redundancy of function for the combined cycle portion of the project (Calpine 2001a, §§ 3.4.2, 4.3.2, and Appendix F). The fact that the project consists of two trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other train to fail, thus allowing the plant to continue to generate (at reduced output). Further, the plant's distributed control system (DCS) will be built with typical redundancy. Emergency DC and AC power systems will be supplied by redundant batteries, chargers and inverters. An emergency gas fired generator will also be installed to provide power to essential service AC systems in the event of grid failure or loss of outside power to the plant (Calpine 2001a, §§ 3.4.5, 3.4.6, and 3.4.7). Other balance of plant equipment will be provided with redundant examples, thus:

- Two 100 percent HRSG feed water pumps per HRSG;
- three 50 percent condensate pumps;
- two 50 percent circulating water pumps;
- two 100 percent closed loop water pumps;
- two 100 percent closed cycle cooling water heat exchangers;
- three 50 percent demineralized water systems with redundant installed pumps; and
- two 100 percent air compressors.

With this opportunity for continued operation in the face of equipment failure, staff believes that equipment redundancy will be sufficient for a project such as this.

Maintenance Program

Calpine proposes to establish a plant maintenance program typical of the industry (Calpine 2001a, § 4.3.5). Equipment manufacturers provide maintenance recommendations with their products; the applicant will base its maintenance program on these recommendations. The program will encompass preventive and predictive maintenance techniques. Maintenance outages will be planned for periods of low electricity demand. In light of these plans, staff expects that the project will be adequately maintained to ensure acceptable reliability.

FUEL AND WATER AVAILABILITY

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

Fuel Availability

The IEEC will burn natural gas from the existing Sempra Energy system. Gas will be transmitted to the plant via a new 20 inch diameter, 0.9 mile pipeline connection to an existing Sempra Energy natural gas transmission line (Calpine 2001a, §§ 1.5.4, 3.4.8, 3.7.2, and 3.10.3 and Calpine 2001b).

This Sempra Energy intrastate natural gas transmission system represents a resource of considerable capacity. These lines transport natural gas from the Blythe area to San Diego area markets. According to Energy Commission forecasts, there is a potential for very large natural gas demands to develop in the San Diego area and northern Mexico. Based on the Commission's modeling, there appears to be sufficient capacity to meet these demands via Sempra Energy's intrastate transmission system. There also appears to be sufficient capacity to transport natural gas into these markets from West Texas; but this gas is relatively costly. There is insufficient capacity to transport inexpensive natural gas from the Four Corners and Rocky Mountain regions into these markets. A new interstate natural gas transmission line is needed to meet these needs. For the next few years, the supplies appear to be adequate to supply the IEEC. Beyond

this time frame, a new interstate transmission line will likely be needed to supply these markets with inexpensive natural gas (Wood 2002a, pers. comm.).

Based on the Energy Commission's natural gas modeling, staff believes that there are adequate natural gas transport options to serve the proposed project for the next several years. Beyond this period, staff believes that free market forces will work to ensure that a new interstate natural gas transport system is constructed, or some other means are developed to provide natural gas to the IEEC and San Diego area.

Water Supply Reliability

The IEEC will obtain recycled water for cooling and process make-up from Eastern Municipal Water District (EMWD). Recycled and raw water will be delivered to IEEC via a new 0.1 mile long, 12 to 14 inch diameter recycled water pipeline. The new line will connect to an existing 48" recycled water pipeline located in McLaughlin Road adjacent to the southern site boundary. EMWD will make up any deficiencies in its recycled water distribution system by supplementing recycled water with raw water from Metropolitan Water District (MWD) (Calpine 2001a, §§ 1.5.6, 3.4.9, and Appendix M). Potable water for domestic and fire water supply to the project will also be provided by EMWD. This will be accomplished by constructing a new 12" potable water line. The IEEC will include a 2.5 million gallon water storage tank, sized to supply approximately eight hours of operational storage, should the recycled water supply be disrupted. (Calpine 2001a, §§ 3.4.9, 3.4.9.6 and 3.4.9.9). Staff believes these sources yield sufficient likelihood of a reliable supply of water. (For further discussion of water supply, see that portion of this document entitled **Soil & Water Resources**.)

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, tsunamis (tidal waves) and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but flooding and seismic shaking (earthquake) present credible threats to reliable operation.

Flooding

The site is essentially flat with an average elevation of 1,440 feet above mean sea level. The site is bordered on the south and west by the 100-year floodplain, as mapped by FEMA. However, the floodplain does not extend onto the proposed site. Combined with a proper grading and drainage plan, there should be no credible threat of flooding (Calpine 2001a, §§ 1.7, 3.3, 5.4.1.3 and Figure 5.4-3). For further discussion, see that portion of this document entitled **Soil and Water Resources**.

Seismic Shaking

The site lies within Seismic Zone 4 (Calpine 2001a, §§ 5.5 and 5.5.1.6); see that portion of this document entitled **Geology and Paleontology**. The project will be designed and constructed to the latest appropriate LORS (Calpine 2001a, Table 6.6-1 and Appendices A, B, and G). Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. By virtue of being built to the latest seismic design LORS, this project will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. Staff has proposed conditions of certification to ensure this; see that

portion of this document entitled **Facility Design**. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

COMPARISON WITH EXISTING FACILITIES

Industry statistics for availability factors (as well as many other related reliability data) are kept by the North American Electric Reliability Council (NERC). NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics on the Internet (http://www.nerc.com). NERC reports the following summary generating unit statistics for the years 1994 through 1998 (NERC 1999):

For Combined Cycle units (All MW sizes)
Availability Factor = 91.49 percent

The General Electric "F" class combustion gas turbines that are planned to be employed in the project have been on the market for several years now, and can be expected to exhibit typically high availability. The applicant's prediction of an annual availability factor in the 92 to 98 percent range (Calpine 2001a, § 4.3.1) appears reasonable compared to the NERC figure for similar plants throughout North America (see above). In fact, these new, large machines can well be expected to outperform the fleet of various (mostly older and smaller) gas turbines that make up the NERC statistics. Further, since the plant will consist of two parallel gas turbine generating trains, maintenance can be scheduled during those times of year when the full plant output is not required to meet market demand, typical of industry standard maintenance procedures. The applicant's estimate of plant availability therefore appears realistic. The stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, cannot impact power plant reliability. Reliability impacts on the electric system from facility closure, should there be any, are dealt with in that portion of this document entitled **Transmission System Engineering**.

CONCLUSION

Calpine predicts an equivalent availability factor in the 92 to 98 percent range, which staff believes is achievable in light of the industry norm of 91.5 percent for this type of plant. Based on a review of the proposal, staff concludes that the plant will be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. No conditions of certification are proposed.

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TRANSMISSION SYSTEM ENGINEERING

Mark Hester and Al McCuen

INTRODUCTION

The Transmission System Engineering (TSE) analysis identifies whether or not the transmission facilities associated with the proposed project conform to all applicable laws, ordinances, regulations and standards (LORS) required for safe and reliable electric power transmission and assesses whether or not the applicant has accurately identified all interconnection facilities required for the project.

Staff's analysis evaluates the power plant switchyard, outlet line, termination and downstream facilities identified by the applicant and provides proposed conditions of certification to ensure the project complies with applicable LORS during the design review, construction, operation and potential closure of the project.

Additionally, under the California Environmental Quality Act (CEQA), the Energy Commission must conduct an environmental review of the "whole of the action" that may include facilities not licensed by the Energy Commission (California Code of Regulations (CCR), Title 14, §15378). Therefore, the Energy Commission must identify and evaluate the environmental effects of construction and operation of any new or modified transmission facilities required for the project's interconnection to the electric grid and also beyond the project's interconnection with the existing transmission system that are required as a result of the power plant addition to the California transmission system. The California Independent System Operator (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 Cal-ISO will provide testimony on these matters at the Energy Commission's hearings.

SUMMARY OF CONCLUSIONS

The Inland Empire Energy Center (IEEC or project) applicant proposes to construct a nominal 670 MW natural gas-fired combined cycle generating facility, with a 500-kV switchyard to be located in Southwestern Riverside county. The project will connect to the existing Southern California Edison (SCE) Valley substation via a new 0.9-mile 500-kV transmission line. No downstream facilities are required to maintain system reliability. As proposed, the project will comply with applicable LORS assuming the proposed Conditions of Certification are met.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

- 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.

- The National Electric Safety Code, 1999, provides electrical, mechanical, civil and structural requirements for overhead electric line construction and operation.
- 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 a single transmission element out of service) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas during major disturbances (such as loss of all lines in a right of way). 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 provide policies, standards, principles and guidelines 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 guidelines 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. It also applies when there are any impacts to the Cal-ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the Cal-ISO.

PROJECT DESCRIPTION

SWITCHYARD AND INTERCONNECTION FACILITIES

The IEEC will consist of three generating units, two 175 MW combustion turbine generators, each with an auxiliary load of 5 MW and a 329-MW steam generator, for a

total nominal output of 670 MW (Calpine 2001a, Page 1-3). Each generating unit will be connected to a 18/500 kV step-up transformer and the high voltage terminals of the transformers will be connected to the new IEEC 500 kV switchyard by overhead conductors (Calpine 2001a, page 3-16). The IEEC 500-kV switchyard will be constructed with four bays in a breaker and a half arrangement for a total of nine air-insulated 500 kV circuit breakers. The IEEC switchyard will be connected to the existing Southern California Edison Valley Substation via a new 0.9-mile 500 kV transmission line using two 2156 KCMIL ACSR (see Definition of Terms) conductors per phase (Calpine 2002a, Facility Study page 3). This configuration for the interconnection and switchyard is in accordance with good utility practices and is considered acceptable.

ANALYSIS AND IMPACTS

Beyond the interconnection facilities and switchyard as proposed by the applicant (discussed above), no other new transmission facilities will be required for the reliable interconnection of the project.

DOWNSTREAM IMPACTS

The project impacts on the transmission system downstream of the interconnection facilities are discussed in the System Reliability section. Based on the short circuit duty study, a number of circuit breakers may be over stressed due to the increased duty. Breaker replacement or other means may be required to mitigate the identified problem due to increased short circuit duties, however breaker replacements occur within the fenceline of exiting facilities and are not considered significant for the purposes of this analysis. No normal or emergency line overloads were identified in the System Impact Study or the Facility Study for the IEEC and the project will not require significant downstream facilities for interconnection.

SYSTEM RELIABILITY

INTRODUCTION

A System Impact Study (SIS) and Facility Study are performed to determine the alternate and preferred interconnection facilities to the grid, downstream transmission system impacts and their mitigation measures in conformance with system performance levels as required in utility reliability criteria, NERC planning standards, WSCC reliability criteria and Cal-ISO reliability criteria. The studies determine both positive and negative impacts. For the reliability criteria violation cases, i. e, for negative impacts, the studies determine the alternate and preferred additional transmission facilities or other mitigation measures. The studies normally include a Load Flow study, a Transient Stability study, a Post-transient Load Flow study and a Short Circuit study focused on thermal overloads, voltage deviations, system stability (excessive oscillations in generators and transmission system, voltage collapse, loss of loads or cascading outages) and short circuit duties.

Any new transmission facilities such as the power plant switchyard, the outlet line, and downstream facilities required for connecting a project to the grid are considered part of the project and are subject to the full Application for Certification (AFC) review process.

Scope of System Impact Study

The SCE transmission system was analyzed under the following system conditions;

- 2004 Heavy Summer base case with high Southern California load levels and very high internal SCE eastern area generation.
- 2004 Light Spring base case with low Southern California load levels and very high internal SCE eastern area generation.

The study included Load Flow analysis, Transient Stability study, Post-transient Load Flow study and a Short Circuit study.

Power Flow Study Results

The Power Flow Study results indicate that the interconnection of the IEEC causes no normal or contingency overloads in either the Heavy Summer or Light Spring analysis.

Transient Stability Study Results

Dynamic stability studies were conducted by IEEC using 2004 heavy summer case to determine if the IEEC would create any adverse impact on the stable operation of the transmission grid following selected Cal-ISO category B (N-1) & C (N-2) outages (IEEC 2001a, Appendix I). The results indicate there are no transient stability concerns on the transmission system following the selected disturbances for integration of the IEEC project.

Short Circuit Study Results

The short circuit study performed by SCE evaluated the impact of the IEEC project on the fault duties within SCE bulk transmission system. The results indicate that the Calpine project increases three-phase short circuit duties at twenty-eight bulk power substations and nineteen distribution substations and a significant number of these breakers will require upgrades (IEEC 2002a, Facilities Study page 3). While the upgrade of a large number of circuit breakers could have a significant financial impact on the applicant, circuit breaker replacement occurs within the fenceline of existing transmission facilities and does not have significant environmental impacts.

CUMULATIVE IMPACTS

Staff does not expect any cumulative impacts that will not be identified and mitigated by projects other than the proposed IEEC project in the main SCE area of southern California. Except for a few radial networks, the SCE electric system is highly redundant1 and has been be able to accommodate the generation of new power plants without requiring downstream electric facilities. Currently only two proposed plants, the Palomar Energy Project (Palomar) and the El Segundo Redevelopment Project (El Segundo) are located electrically near the IEEC. Impacts from plants located outside

1 The main Edison network is highly interconnected with many lines over which power can flow. Thus the generation from new plants is dispersed throughout the network limiting the impact of new generation on specific transmission lines.

the main SCE system are electrically isolated from the IEEC and will not have associated cumulative impacts.

Projects proposed in northern California are electrically distant and isolated from the IEEC. The northern California projects connect to Pacific Gas and Electric's (PG&E) transmission network and the impacts of these projects are essentially, electrically isolated from IEEC. In order for power generated by IEEC to impact the same lines as the northern California projects it must flow into the Edison main network and through the Vincent substation towards northern California on the bulk power system. Once on the bulk transmission system, the power generated by IEEC could increase congestion on Path 152 but would not have significant reliability impacts.

There are four power plant projects currently seeking commission certification in the nearby SCE area: the Pastoria II Energy Facility Expansion Project (Pastoria II), Palomar, El Segundo and the Blythe Energy Project Phase II (Blythe II). Pastoria II is located in one of Edison's radial transmission networks and is essentially isolated from the rest of the Edison network for reliability analysis. Palomar interconnects to the San Diego Gas and Electric network and the cumulative impacts of Palomar are have been captured in the System Impact Study for Palomar. The proposed El Segundo project is located in the western part of the SCE electric network and the impacts of this project will be effectively isolated from IEEC by the large load centers between the two projects. Blythe II is interconnecting to the Western Area Power Association near the California-Nevada border and will have minimal impacts on the transmission lines near IEEC. Other potential plants in California are electrically isolated from the main Edison network from a reliability impact perspective.

COMPLIANCE WITH LORS

With the adoption of the recommended conditions of certification the IEEC will comply with LORS.

FACILITY CLOSURE

INTRODUCTION

The parallel operation of generating stations is controlled, in part by CPUC Rule 21, which provides for contractual provisions, which may be developed, to provide backup or other power service during extended periods of non-operation and codify procedures to be followed during parallel operation. Procedures for planned, unexpected temporary closure and unexpected permanent closure must be developed or verified to facilitate effective communication and coordination between the generating station owner, private transmission owner (PTO) and the Cal-ISO to ensure safety and system reliability.

CPUC General Order 95, Rule 31.6 requires that "lines or portions of lines permanently abandoned shall be removed by their owners so that such lines shall not become a

2 Path 15 is the set of lines that limit the import of power into Northern California from Southern California and hence the Southwestern United States.

public nuisance or a hazard to life or property." Condition of certification TSE-5a requires compliance with this rule.

The ability of the above LORS to reasonably assure safe and reliable conditions in the event of facility closure was evaluated for three scenarios: Planned Closure, Unexpected Temporary Closure, and Unexpected Permanent Closure. Planned Closure occurs in a planned and orderly manner such as at the end of its useful economic or mechanical life or due to gradual obsolescence. Under such circumstances the requirement for the owner to provide a closure plan 12 months prior to closure in conjunction with applicable LORS is considered sufficient to provide adequately for safety and reliability. For instance, a planned closure provides time for the owner to coordinate with the PTO3 to assure (as one example) that the PTO's system will not be connected to the outlet thus energizing the power plant switchyard. Alternatively, the owner may coordinate with the PTO to maintain some power service via the outlet line to supply critical station service equipment or other loads4.

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly for a short term due to unforeseen circumstances such as a natural or other disaster or emergency. During such a closure the facility cannot insert power into the utility system. Closures of this sort can be accommodated by establishment of an on-site contingency plan, which must be put in place and approved by the CPM prior to the beginning of commercial operation of the facilities to assure safety and reliability (see General Conditions Including Compliance Monitoring and Closure Plan). Unexpected Temporary Closure occurs when the project owner closes the facility suddenly and/or unexpectedly, or abandons the facility or 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.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that the IEEC will not have any negative impacts on the transmission system and no significant downstream down stream facilities will be required for interconnection. Condition of certification **TSE-5** will assure conformance with reliability criteria.

1. Staff concludes the IEEC switchyard and interconnection facilities to the SCE grid by 500 kV line through the IEEC switchyard will be adequate and reliable.
2. To accommodate interconnection of the IEEC project, staff concludes that circuit breaker replacement at buses should be evaluated to offset downstream adverse impacts on the twenty nine bulk power substations and eighteen 115 kV substations.

3 The PTO in this instance is SCE, the owner of the system to which the project is interconnected.
4 These are mere examples; many more exist.

3. The power plant switchyard, outlet lines, and terminations are in accordance with good utility practices and acceptable. Staff concludes that these facilities will comply with LORS, assuming the Conditions of Certification are met.

RECOMMENDATIONS

If the Commission approves the project, Staff recommends that the following Conditions of Certification be implemented to insure compliance with LORS.

PROPOSED CONDITIONS OF CERTIFICATION

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

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Table 1: Major Equipment List** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Equipment List
Breakers
Step-up transformers
Switchyard
Busses
Surge arrestors
Disconnects
Take off facilities
Electrical control building
Switchyard control building
Transmission pole/tower

TSE-2 Prior to the start of construction the project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; D) a mechanical engineer. [California Business and Professions Code section

6704 et seq., and sections 6730 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.]

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical or civil and design engineer assigned in conformance with Facility Design condition **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the initial engineers and any new engineers. These engineers 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.

The electrical engineer shall:

1. Be responsible for the electrical design of the power plant switchyard, outlet, and termination facilities; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

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

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

TSE-3 The project owner shall keep the CBO informed regarding the status of engineering design 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.

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

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

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

TSE-5 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to all applicable LORS, including the requirements listed below. The substitution of Compliance Project Manager (CPM) and CBO approved "equivalent" equipment and an equivalent substation configuration is acceptable. The project owner shall submit the required number of copies of the design drawings and calculations as determined by the CBO.

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

1. Breakers and buses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.

2. 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.

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

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

5. The project owner shall provide to the CPM:

a. The final Detailed Interconnection Facility Study (DIFS) or Facility Cost Report including a description of facility upgrades, operational mitigation measures, and/or Special Protection System (SPS) sequencing and timing if applicable,

b. Executed Facility Interconnection Agreement,

c. Verification of Cal-ISO Notice of Synchronization.

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

Design drawings, specifications and calculations conforming with CPUC General Order 95 or the NESC, Title 8, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", the NEC, CPUC Rule 21, applicable interconnection standards and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.

For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst case conditions"[5] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or the NESC, Title 8, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", the NEC, applicable interconnection standards, and related industry standards.

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

a. The Facilities Study and Executed Facility Interconnection Agreement shall be provided concurrently to the CPM and CBO.

TSE-6 The project owner shall inform the CPM and CBO of any impending changes, which may not conform to the requirements **TSE-5** a) through f), and have not received CPM and CBO approval, and request approval to implement such changes. A detailed description of the proposed change and complete

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

engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or substation configurations shall not begin without prior written approval of the changes by the CBO and the CPM.

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

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

1. At least one week prior to synchronizing the facility with the grid for testing, provide the Cal-ISO a letter stating the proposed date of synchronization; and
2. At least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the ISO Outage Coordination Department, Monday through Friday, between the hours of 0700 to 1530 at (916)-351-2300.

Verification: The applicant shall provide copies of the Cal-ISO letter to the CPM when it is sent to the Cal-ISO one week prior to initial synchronization with the grid. A report of conversation with the Cal-ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California transmission system for the first time.

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

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

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

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

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

REFERENCES

Cal-ISO (California Independent System Operator). 1998a. Cal-ISO Tariff Scheduling Protocol posted April 1998, Amendments 1,4,5,6, and 7 incorporated.

Cal-ISO (California Independent System Operator). 1998b. Cal-ISO Dispatch Protocol posted April 1998.

Calpine (Calpine Corporation/Hatfield). 2001a. Submittal of Application for Certification. Submitted to the California Energy Commission, August 17, 2001.

Calpine (Calpine Corporation/Thomas). 2002a. Data Adequacy Responses. Submitted to the California Energy Commission, December 4, 2001.

NERC (North American Electric Reliability Council) 1998. NERC Planning Standards, September 1997.

WSCC (Western Systems Coordinating Council) 1997. Reliability Criteria, August 1998.

DEFINITION OF TERMS

ACSR — Aluminum cable steel reinforced.

AASS — Aluminum cable steel supported.

AAC — All Aluminum conductor.

Ampacity — Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.

Ampere — The unit of current flowing in a conductor.

Kiloamp (kA) — 1,000 Amperes

Bundled — Two wires, 18 inches apart.

Bus — Conductors that serve as a common connection for two or more circuits.

Conductor — The part of the transmission line (the wire) that carries the current.

Congestion Management
Congestion management is a scheduling protocol, which provides that dispatched generation and transmission loading (imports) will not violate criteria.

Emergency Overload
See Single Contingency. This is also called an L-1.

Kcmil or kcm
Thousand circular mil. A unit of the conductor's cross sectional area, when divided by 1,273, the area in square inches is obtained.

Kilovolt (kV)
A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground. 1,000 Volts.

Loop — An electrical cul de sac. A transmission configuration that interrupts an existing circuit, diverts it to another connection and returns it back to the interrupted circuit, thus forming a loop or cul de sac.

Megavar — One megavolt ampere reactive.

Megavars Mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.

Megavolt ampere (MVA)
A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

Megawatt (MW)
A unit of power equivalent to 1,341 horsepower.

Normal Operation/ Normal Overload
When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.

N-1 Condition
See Single Contingency.

Outlet Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.

Power Flow Analysis
A power flow analysis is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.

Reactive Power
Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.

Remedial Action Scheme (RAS)
A remedial action scheme is an automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload.

SF6 Sulfur hexafluoride is an insulating medium.

Single Contingency
Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.

Solid dielectric cable

Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.

Switchyard A power plant switchyard (switchyard) is an integral part of a power plant and is used as an outlet for one or more electric generators.

Thermal rating

See ampacity.

TSE Transmission System Engineering.

TRV Transient Recovery Voltage

Tap

A transmission configuration creating an interconnection through a sort single circuit to a small or medium sized load or a generator. The new single circuit line is inserted into an existing circuit by utilizing breakers at existing terminals of the circuit, rather than installing breakers at the interconnection in a new switchyard.

Undercrossing

A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

Underbuild

A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

ALTERNATIVES

Sue Walker

INTRODUCTION

This section considers potential alternatives to construction and operation of the proposed Inland Empire Energy Center (IEEC). The purpose of this alternatives analysis is to comply with California's environmental laws by providing an analysis of a reasonable range of feasible alternatives that could substantially reduce or avoid the potentially significant adverse impacts of the proposed project (California Code of Regulations, title 14, §15126.6; California Code of Regulations, title 20, § 1765). This section identifies potentially significant impacts of the proposed project and analyzes different technologies and alternative sites that may reduce or avoid significant impacts. Staff has also analyzed the impacts that may be created by locating the project at alternative sites.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

The proposed IEEC is not located on federal lands and consequently is not subject to review under the National Environmental Policy Act (NEPA), which would require an analysis of alternatives that meet the primary purposes and needs of the project. No other federal LORS are applicable to this alternatives analysis.

STATE

California Environmental Quality Act

The "Guidelines for Implementation of the California Environmental Quality Act (CEQA)," Title 14, California Code of Regulation §15126.6(a), provides direction by requiring an evaluation of the comparative merits of "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project." In addition, the analysis must evaluate the No Project Alternative (California Code of Regulations, title 14, §15126.6(e)).

The range of alternatives is governed by the "rule of reason" which requires consideration only of those alternatives necessary to permit informed decision-making and public participation. CEQA states that an environmental document does not have to consider an alternative of which the effect cannot be reasonably ascertained and of which the implementation is remote and speculative (Cal. Code Regs., tit. 14, §15125(d)(5)). However, if the range of alternatives is defined too narrowly, the analysis may be inadequate (City of Santee v. County of San Diego (4th Dist. 1989) 214 Cal. App. 3d 1438).

PROJECT DESCRIPTION

The proposed project would be a natural gas fired power plant with a nominal electrical output of 670 megawatts (MW). The proposed project additionally includes a new 30-foot wide access road to the facility, a new 0.9 mile natural gas pipeline along Menifee Road, a switchyard and 0.9-mile 500 kilovolt (kV) transmission line that connects to the Southern California Edison (SCE) Valley Substation (located approximately one mile southeast of the site), a gas compressor station located on Menifee Road, and a new 4.7 mile wastewater pipeline (Calpine, 2001a). Please refer to the **PROJECT DESCRIPTION** section of this Preliminary Staff Assessment (PSA) for additional project detail.

The facility is proposed to be located on a 45.8 acre site within an unincorporated area of Riverside County (County). The site is within the County's "Menifee North Specific Plan Area," and adjacent to the community of Romoland. The site is bordered to the north by Ethanac Road, to the south by McLaughlin Road, and to the west by Antelope Road. The site is currently a fallow agricultural field that is designated Industrial under the County's Menifee North Specific Plan, and zoned Heavy Manufacturing (M-H) under the County's zoning ordinance (Calpine, 2001a).

SITE SELECTION

As stated in the Application for Certification (AFC), the proposed site was selected according to the following criteria:

- A location in close proximity (less than one mile) to SCE's Valley Substation
- A location within industrially-zoned property
- A location within an area that would be acceptable to County officials
- A location near a sufficient source of cooling water, preferably recycled water
- A location with good transmission access
- A location near an ample fuel gas supply
- A parcel large enough to accommodate the proposed facility
- A site which can be purchased (or leased for the duration of the project's lifetime)
- A site that is not located within a floodplain
- A location where potential environmental impacts are readily mitigable

SCOPE AND METHODOLOGY OF THE ALTERNATIVES ANALYSIS

The purpose of staff's alternatives analysis is to provide a reasonable range of feasible alternatives that could substantially reduce or avoid any potentially significant adverse impacts of the proposed IEEC. To accomplish this, staff must determine the appropriate scope of analysis. Consequently, it is necessary to identify and determine the potentially significant impacts of the proposed project and then focus on alternatives that are capable of reducing or avoiding significant impacts.

To prepare this alternatives analysis, staff used the following methodology:

- Identify the basic objectives of the project, provide an overview of the project, and describe its potentially significant adverse impacts.
- Identify and evaluate technology alternatives to the project, including conservation and renewable sources.
- Identify and evaluate alternative locations or sites.
- Evaluate the impacts of not constructing the project, known as the No Project Alternative under CEQA.

PROJECT OBJECTIVES

As stated in the project's AFC, the primary objective of the IEEC is "to construct and operate a facility for the production of economical, reliable, and environmentally sound electrical energy and capacity to meet California's energy demands" (Calpine, 2001a).

In reviewing the AFC, Energy Commission staff has determined that additional objectives of the proposed IEEC include:

- To generate approximately 670 MW of electricity.
- To be located near the existing SCE Valley Substation.
- To be located near key infrastructure for natural gas, water supply and transmission lines.
- To be located on a site that is zoned for heavy industrial uses.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS

- In the project's Issues Identification Report, staff identified the potential for significant environmental effects of the proposed project in five technical areas: air quality; land use; power plant efficiency; socioeconomics; and water resources. A summary of these issues is presented below. It is noted that in completing the technical sections for this Preliminary Staff Assessment (PSA), many of the potential impacts associated with these issues have been resolved; where resolution has been found, it is also noted below. This alternatives analysis is based upon the findings of staff's current PSA analysis.
- **Land Use:** The IIR concludes that the IEEC may result in two inconsistencies with the County's adopted Zoning Ordinance, thereby creating potential impacts. The first issue is that the IEEC site is zoned for heavy industrial uses, but the County's Zoning Ordinance does not specifically state that power plants are an allowable use under this zoning designation; therefore, there may be a land use inconsistency associated with the project. However, as reviewed in the **LAND USE** section of this PSA, the County has, since publication of the IIR, indicated support of the project and would conditionally allow such a use in this zone. Proposed conditions of certification found in the **LAND USE** section of this PSA would accommodate the County's conditions of approval. Therefore, it is no longer considered a potentially significant impact. The second issue identified in the IIR concerns the fact that the

proposed facility's Heat Recovery Steam Generator (HRSG) stacks (195 feet in height) would exceed the County's height restriction of 105 feet. A height variance would be required in order to make findings of land use consistency with the County's Zoning Ordinance. Staff has concluded that granting a height variance from applicable height requirements for the HRSG stacks would allow the project site to be used in a manner enjoyed by other properties subject to M-H Zone requirements and be consistent with the intent and purpose of the M-H Zone and, therefore, would not constitute a grant of special privileges. Please refer to the **LAND USE** section of this PSA for additional information on the HRSG stacks. A third issue identified in the IIR relates to the Romoland School District's concerns regarding the proposed facility's close proximity to the Romoland Elementary School, potential health and safety impacts to students, and how the IEEC may restrict the siting of future schools within the project area. Although detailed responses to some data requests regarding the Romoland School District had not been received by staff at the time of this writing, staff has concluded that there would be no potentially significant impacts associated with this issue. Please refer to conclusions 4 and 5 of the **LAND USE** section of this PSA for additional information regarding the Romoland School District's concerns.

- **Power Plant Efficiency:** The Applicant proposes to employ duct burners that are much larger than is customary, thus resulting in a facility that is much less efficient than may be expected. While the efficiency of a combined cycle power plant is typically about 56 percent, that of a duct burner plant is closer to 40 percent. By relying on duct burners for up to 142 MW of output, the IIR concludes that the proposed duct burners may significantly reduce the overall efficiency of the plant. However, as reviewed in the **POWER PLANT EFFICIENCY** section of this PSA, staff has concluded that this is not a significant issue.
- **Socioeconomics:** There are existing minority populations of greater than 50 percent within a six-mile radius of the IEEC site, which may create impacts associated with Environmental Justice. A focused Environmental Justice screening analysis is included in this PSA to determine potential impacts to minority populations.
- **Water Resources:** The IIR notes that the IEEC proposes to meet its water demand with reclaimed water supplied by the Eastern Municipal Water District (EMWD), supplemented with imported freshwater through the year 2010. However, reclaimed water is dependent upon projected population growth. Any shortfalls in reclaimed water are proposed to be accommodated with additional surface water, which may cause significant impacts. Additionally, the IIR notes that the use of reclaimed water may reduce groundwater recharge and supply for EMWD's planned brackish water desalination plant, resulting in the need for additional fresh water supply to the area. This could create potentially significant impacts. However, staff has concluded that these issues would not result in significant impacts with implementation of the proposed conditions of certification found in the **SOIL & WATER RESOURCES** section of this PSA.

SITE ALTERNATIVES

The project's AFC identifies three alternative sites, as well as a No Project Alternative. In addition to these sites, staff has identified three additional sites for evaluation. Additional sites identified by staff that were not carried forward for evaluation are summarized in the subsection entitled "Site Alternatives Eliminated From Further Analysis."

SCREENING CRITERIA USED TO SELECT ALTERNATIVE SITES

The following criteria were used to identify potential alternative sites:

1. Avoid or substantially lessen one or more of the potential significant effects of the project.

2. Satisfy the following criteria:

    a. Location. In order to meet project objectives, the site should be located near the SCE Valley Substation.

    b. Site suitability. Sufficient land is needed to construct and operate a generating facility of this size. The proposed power plant would be located on and estimated 45.8 acres of land, however only 35 acres is required for a generating facility and switchyard (CALPINE, 2001a). Therefore, staff used 35 acres as the minimum lot size needed to accommodate the facility.

    c. Availability of infrastructure. The site should be within a reasonable distance of natural gas and water supply.

    d. Availability of the site.

    e. Not located adjacent to moderate or high density residential areas or to sensitive receptors (such as schools and hospitals) or to recreation areas.

    f. The site should be vacant.

ALTERNATIVES Figure 1

Sites 1, 2, 3 and 4: Properties Within The Vicinity of The SCE Valley Substation

ALTERNATIVES Figure 2
Site 5: Property Adjacent to Briggs Road

ALTERNATIVES Figure 3
Site 6: Property Southwest of Banning

SITE 1: PROPERTIES LOCATED EAST OF THE SCE VALLEY SUBSTATION

Site 1 was identified by the Applicant in the project's AFC (Calpine, 2001a). The site includes approximately 1,500 acres of land to the east of SCE's Valley Substation. Although the AFC did not provide a map of the site, based on field reconnaissance its general location is provided in **ALTERNATIVES Figure 1**. The majority of the area is currently agricultural in nature; however, it additionally includes some commercial and light industrial uses, including SCE offices and maintenance facilities.

According to the project's Data Adequacy Responses on the AFC, Site 1 is zoned Residential Agriculture. As of July 2002, Site 1 had completed its CEQA environmental review process for a proposed 4,500 residential development as part of the Menifee Ranch Specific Plan. The proposed project is currently scheduled to be reviewed for tentative approval by the County Planning Commission on August 7, 2002 (Stamps, 2002a).

Advantages

- The site is located near the SCE Valley Substation.
- The site is located near a sufficient source of cooling water.
- The site has good transmission access.
- The site is located near an ample fuel gas supply.
- The site would have ample acreage to accommodate the facility.
- The site is located outside of the 100-year floodplain.
- The site is slightly further away from the existing residential areas and the Romoland Elementary School.

Disadvantages

- The site will not be available if the Menifee Ranch Specific Plan for residential development is approved.
- The site is not zoned for heavy industrial use.
- The site is immediately adjacent to areas designated for residential and commercial development, and may, if developed, result in an incompatible land use.
- The facility itself, as proposed, would still result in the same potential environmental impacts to air quality, land use, power plant efficiency, socioeconomics, and water resources.

SITE 2: PROPERTIES LOCATED SOUTH OF THE SCE VALLEY SUBSTATION

Site 2 was identified by the Applicant in the project's AFC (Calpine, 2001a). The site includes two properties located south of the SCE Valley Substation. One property is a 30 acre parcel that was in option at the time of the AFC filling, and the other property is a 23-acre parcel. The area making up Site 2 is currently undeveloped.

The AFC does not provide a specific site location map; however, based upon field reconnaissance and zoning maps provided in the project's Data Adequacy Responses on the AFC, there are areas zoned "Manufacturing-Service-Commercial" and "Industrial Park" south of the SCE Valley Substation (Calpine, 2001a). The County's Zoning Ordinance does not have a zone specifically addressing power plants; however, under the "Manufacturing-Service-Commercial" and "Industrial Park" zones, a power plant may potentially be an allowable use under the category of "public utility substations and storage yards" if appropriately conditioned to comply with the County's laws, ordinances and regulations for development (Stamps, 2002b). However, staff does not know if the County would support the project under either one of these zones. The AFC notes, however, that adjacent landowners would likely be opposed to the siting of a power plant at this location (Calpine, 2001a). Although the AFC does not detail such opposition, staff believes that it would be due to planned commercial development near the site, thereby creating incompatible land uses.

Advantages

- The site is in close proximity to the SCE Valley Substation
- The site is located near a sufficient source of cooling water.
- The site has good transmission access.
- The site is located near an ample fuel gas supply.
- The site may have the needed acreage to accommodate the facility if both properties are acquired.
- The site is located outside of the 100-year floodplain.
- The site is slightly further away from residential areas and the Romoland Elementary School.

Disadvantages

- The 30 acre property will not be available if the AFC-referenced option to lease or sell is completed, and the 23 acre property is not, alone, large enough to accommodate the facility.
- The site's existing zoning may not allow for a power plant or be supported by the County.
- The site is immediately adjacent to land zoned for commercial development and could, if developed, result in an incompatible land use and opposition from owners of the adjacent properties.
- The facility itself, as proposed, would still result in the same potential environmental impacts to air quality, land use, power plant efficiency, socioeconomics, and water resources.

SITE 3: ADDITIONAL PROPERTIES ZONED HEAVY MANUFACTURING ADJACENT TO THE PROPOSED SITE

The AFC additionally evaluated four properties located immediately adjacent to the proposed site. Two of these properties are located east of the proposed site, and two

are located west of the proposed site. Although the AFC does not provide a specific site location map, based on field reconnaissance and zoning maps provided in the project's Data Adequacy Responses on the AFC, the general proximity of these properties are provided in **ALTERNATIVES Figure 1**. All four of these properties are zoned Manufacturing-Heavy, and, as in the case of the proposed site, would likely be supported by the County if appropriately conditioned.

The first property east of the proposed site is an 18.45 parcel located adjacent to the east side of San Jacinto Road. The second property east of the proposed site is an 11 acre site located at the southwest corner of the intersection between the railroad and Palomar Road. These properties are currently undeveloped, and both are within the 100-year floodplain (Calpine, 2001a).

Properties evaluated in the AFC to the west of the proposed facility include a 53 acre parcel and a 34 acre parcel. These properties are located east of Antelope Road and north of McLaughlin Road. The sites are currently undeveloped or in agricultural production. Both are located within the 100-year floodplain (Calpine, 2001a). According to the AFC, neither of the two properties is available for purchase (Calpine, 2001a).

Advantages

- The properties are in close proximity to the SCE Valley Substation
- The properties are located near a sufficient source of cooling water.
- The properties have good transmission access.
- The properties are located near an ample fuel gas supply.
- One of the properties west of the proposed facility is large enough to accommodate the facility.
- The properties east of the proposed site are slightly further away from residential areas and the Romoland Elementary School.
- The properties have zoning designations that would likely be supported by the County if appropriately conditioned.

Disadvantages

- The two properties east of the proposed facility, independently of each other, are not large enough to accommodate the facility.
- The properties are within the 100-year floodplain.
- The properties located west of the proposed site would be located closer to residential areas and the Romoland Elementary School.
- With the exception of the 11 acre property east of the proposed site, the properties are not available for lease or sale.
- The facility itself, as proposed, would still result in the same potential environmental impacts to air quality, land use, power plant efficiency, socioeconomics, and water resources.

SITE 4: OTHER PROPERTIES LOCATED WITHIN THE IMMEDIATE PROJECT VICINITY WITH APPROPRIATE ZONING DESIGNATIONS

In addition to the alternative sites evaluated in the AFC, staff identified one other site within the immediate project area that had the acreage and appropriate zoning necessary for the proposed facility. The site is located approximately 600 feet north of Pincate Road, and 1,000 feet west of Menifee Road. The site is an estimated 53 acre area that is zoned Industrial Park. Although County planning staff has indicated that this zoning may potentially support a power plant if conditioned appropriately (Stamps, 200b), CEC staff does not know if it would be supported by County decision makers with or without a re-zone approval. The site is currently undeveloped; however, staff does not currently know if the area has been proposed for development, or if the property would be available for lease or sale. According to Figure 5.4-2 of the AFC ("FEMA Flood Zone") the site is not located within the 100-year floodplain (Calpine, 2001a).

Advantages

- The site is in close proximity to the SCE Valley Substation
- The site is near a sufficient source of cooling water.
- The site is located near an ample fuel gas supply.
- The site is large enough to accommodate the facility.
- The site is not within the 100-year flood plain.

Disadvantages

- The site would require a new transmission line utility corridor to the SCE Valley Substation.
- The site may not be available for lease or sale.
- The site is in close proximity to exiting residential areas, both rural and densely populated.
- The site may be planned for development.
- The site site's existing zoning may not allow for a power plant or be supported by the County.
- The site is immediately adjacent to an area planned for commercial development.
- The facility itself, as proposed, would still result in the same potential environmental impacts to air quality, land use, power plant efficiency, socioeconomics, and water resources.

SITE 5: PROPERTY ADJACENT TO BRIGGS ROAD

Site 5 is located approximately eight miles south of the proposed project location. The site is located approximately one mile east of Interstate Highway 215, one mile south of Scott Road and immediately west of Briggs Road. The site is within an unincorporated area of the County, and encompasses an estimated 640 acres of land. The site is currently undeveloped and used for rural residential and agricultural purposes. The site falls

under the County's Rural Residential land use designation and zone. The Rural Residential zone allows for public utility uses that include "structures and the pertinent facilities necessary and incidental to the development and transmission of electrical power and gas such as hydroelectric power plants, booster or conversion plants, transmission lines, pipelines and the like."

The site is located in close proximity to the two natural gas pipelines that connect to the SCE Valley Substation, as well as the Auld Substation and the existing transmission line Right-of-Ways (ROWs) that connect the Auld Substation to the SCE Valley Substation. The site is or is not located within the 100-year floodplain (Riverside County Flood Control District, 2002).

Advantages

- The site can connect to the SCE Valley Substation via existing transmission line ROWs
- The site is in close proximity to the proposed project's natural gas supply pipeline.
- The site is large enough to accommodate the facility.
- The site has the appropriate land use designation/zoning, assuming that the facility would be conditioned to comply with the County's land use laws, ordinances and regulations for public utilities use development.
- The site has good access via Scott and Briggs Road.
- The site is set-back within a rural area that would substantially reduce potential impacts to populated areas, such as air quality, land use, risk of upset and visual resources.
- The site is not within the 100-year floodplain.

Disadvantages

- The site may not be available for lease or sale.
- The site is within the Eastern Municipal Water District's (EMWD's) service area, but would require the construction and operation of additional pipelines to connect to EMWD's infrastructure.

SITE 6: PROPERTY SOUTHWEST OF BANNING

Site 6 is located at the base of the San Jacinto Mountains, approximately 2.5 miles southwest of the southern boundary of the City of Banning (Banning). The site is within an unincorporated area of the County and is approximately 640 acres in size. It is designated Rural Mountainous and is currently undeveloped and used for rural residential and agricultural purposes. The County's Land Use Ordinance (Ordinance 348) does not have a zone specific to Rural Mountainous; however, for the purposes of this analysis, staff assumes that the same public utility uses that are provided for the County's Rural Residential zone, as described above, would apply to the Rural Mountainous land use designation. To support this assumption it is noted that under the Land Use Element of County's General Plan, these two land use designations are grouped together and have the same goals and policies. Site 6 is located in close proximity to an existing 500kV transmission line corridor that connects to the SCE

Valley Substation, and is approximately two miles south of two large natural gas pipelines (one being 27 to 32 inches in diameter, and the other being 33 to 42 inches in diameter). The site is not located within the 100-year floodplain (Riverside County Flood Control District, 2002).

Advantages

- The site can connect to the SCE Valley Substation via existing transmission line ROWs.
- The site is in close proximity to a natural gas supply pipeline.
- The site is large enough to accommodate the facility.
- The site has the appropriate land use designation, assuming that the facility would be conditioned to comply with the County's land use laws, ordinances and regulations for public utilities use development.
- The site is set-back within a remote area that would substantially reduce potential impacts to populated areas, such as air quality, land use, risk of upset and visual resources.
- The site is not within the 100-year floodplain.

Disadvantages

- The site may not be available for lease or sale.
- The site is not within EMWD's service area and would require confirmation of a reliable water supply, as well as infrastructure.
- The site does not currently have adequate vehicular access and would require the construction of new roads.

SITE ALTERNATIVES ELIMINATED FROM FUTHER ANALYSIS

CEQA guidelines state that the alternatives discussion need not consider alternatives that are either infeasible or do not avoid significant environmental impacts. This section overviews four other sites that were initially identified by staff as alternatives to the IEEC project, but eliminated from in-depth consideration.

Immediate Project Vicinity

Within the immediate project vicinity there are two additional sites that are zoned Manufacturing-Service-Commercial, and, therefore, could potentially accommodate a power plant. These sites are not within the 100-year floodplain. They are located west of Sherman Road and north of Pinacate Road (a small portion of one of the sites is located south of Pinacate Road), and are located an estimated 1.7 miles northwest of the SCE Valley Substation.

Although these sites have the necessary zoning for the proposed facility, staff does not consider them to be viable candidates for the following reasons:

- The sites are located immediately adjacent to a densely populated area of the community of Romoland, as well as the Romoland Elementary School.

- The sites would require increased transmission line length and a new utility corridor that could, depending on design, traverse residential communities.
- The sites are estimated to be approximately 23 acres and 25 acres in size and are not contiguous to each other. Neither site alone is large enough to accommodate the facility.

General Project Area

At a broader geographic scale, staff identified two areas that had the necessary land use designations and zoning required for the facility. The first area is located along the eastern side of Interstate Highway 15, within Temescal Canyon (Canyon). There are several properties within this area that are designated either Industrial, Industrial-Commercial, or Light-Industrial. Although placement of the proposed facility in this area would be compatible with both existing and planned uses along the majority of the eastern side of the Canyon, and would remove it from a densely populated area, these sites were not considered viable candidates because: (1) it would be difficult to configure a power plant within the narrow and sometimes steep topography of the Canyon; (2) the Canyon's vehicular access is limited to Temescal Canyon Road, which would not be able to support proposed construction activities and would not be readily widened due to the Canyon's narrow character and the road's close proximity to Interstate Highway 215, Temescal Wash, and an Atchison, Topeka, Santa Fe railroad; and, (3) the area is not within close proximity to existing natural gas pipeline or transmission line infrastructure. At the time of this writing, staff had not yet ascertained if the area is or is not located within the 100-year floodplain; however, it is anticipated that at least portions of the Canyon are within the 100-year floodplain due to its proximity Temescal Wash.

Two additional sites near the City of Hemet (Hemet) were additionally identified as potential candidates. These sites are located immediately west of Warren Road and south of Florida Avenue (Highway 74/79). One site is located immediately west of the Hemet-Ryan Airport and is approximately 148 acres in size. The other site is located approximately one mile south of the first site and is approximately 257 acres in size. Both sites are undeveloped and zoned for Manufacturing (M). Although staff does not know if the City would support such a facility, under the "Manufacturing Land Use Matrix" of Hemet's Zoning Ordinance the facility may be a conditionally allowable use under the "Public Facilities" category, which permits "Public facilities and utilities including, but not limited to electrical substations, transmission substations, city facilities, and public offices" (City of Hemet, 1990). These two sites are not located within immediate proximity of a densely populated area, are owned by the County, and, per a site visit in May 2002, appear to be available for lease or sale (City of Hemet, 2002). At the time of this writing, staff had not yet ascertained if the site is or is not located within the 100-year floodplain.

Although placement of the facility at either of these two sites would substantially reduce potential impacts associated with a densely populated area, they were not considered for in-depth consideration because: (1) there are no existing transmission line ROWs within the vicinity that could accommodate a 500kV line to connect to the Valley Substation; (2) they may not have the water supply or natural gas infrastructure necessary for the proposed facility; and (3) there may be land use conflicts associated

with their close proximity to the Hemet-Ryan Airport, San Diego Aqueduct and San Diego Canal.

NO PROJECT ALTERNATIVE

The No Project Alternative assumes that the project is not constructed. In A CEQA analysis, the No Project Alternative is compared to the proposed project to determine if it is superior, equivalent, or inferior to it. CEQA Guidelines state "the purpose of describing and analyzing a No Project Alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project" (California Code of Regulations, Section 15126.6(i)). To that end, the No Project Alternatives analysis considers "existing conditions" and "what would be reasonably expected to occur in the foreseeable future if the project were not approved…" (Section 15126.6(e)(2)).

The No Project Alternative assumes that the proposed IEEC would not be constructed. If the facility were not constructed, the proposed site would likely remain in agricultural production, at least in the near-term. In the AFC, the Applicant states that the main objective of the IEEC is to "construct and operate a facility for the production of economical, reliable and environmentally sound electrical energy and capacity to meet California's growing energy demands" (Calpine, 2001a). A key feature of the proposed project is to be located near the SCE Valley substation, which is currently planned for a 1,000 MW expansion. According to Calpine, siting the facility near the SCE Valley Substation increases system reliability and "reduces the real and reactive system losses, improves area transmission voltage levels, and is generally superior to transmission-based solutions" (Calpine, 2001a).

The proposed IEEC would contribute to California's generating resources, increase competition, and help form a more reliable electric system that meets the goals of the State's deregulated energy market. Due to market forces, the proposed facility may also serve to replace older, inefficient facilities.

If the No Project Alternative were selected, impacts associated with construction and operational of the IEEC would not occur. The project area is, however, anticipated to experience significant growth within the foreseeable future, and it is feasible that the proposed site would be developed for another use if the proposed IEEC is not constructed. Since the area is currently zoned Heavy Manufacturing, it can be reasonably assumed that such development would be industrial in nature.

If the IEEC is not constructed, California would not have an additional 670 MW of electrical generation, enough electricity to supply approximately 670,000 homes (Calpine, 2001a).

ALTERNATIVES ELIMINATED FROM DETAILED ANALYSIS

This section describes alternatives that did not satisfy the screening criteria for inclusion in the more detailed analysis presented above, and include the following:

- Demand side management;
- Distributed generation; and
- Renewable resources.
-

Each of these alternatives, and the reasons for their not being considered in detail in this analysis, is addressed below.

TECHNOLOGY ALTERNATIVES

Conservation and Demand-Side Management

Conservation and demand-side management (DSM) include a variety of approaches, including energy efficiency and conservation, building and appliance standards, load management and fuel substitution. Public Resources Code Section 25305(c) states that conservation, load management, or other demand reducing measures reasonably expected to occur shall be explicitly examined in the Energy Commission's energy forecasts and shall not be considered as alternatives to a proposed facility during the siting process. The forecast that will address this issue is the Energy Commission's California Energy Outlook. Thus, such alternatives are not included in this analysis.

Since 1975, the displaced peak demand from all of these efforts has been roughly the equivalent of eighteen 500-MW power plants. At a state level the annual impact of building and appliance standards has increased steadily, from 600 MW in 1980 to 5,400 MW in 2000, as more new buildings and homes are built under increasingly efficient standards. Savings from energy efficiency programs implemented by utilities and state agencies have also increased (from 750 MW to 3,300 MW). Recent demand reducing proposals from the Governor and Legislature have proven to have an impact by reducing consumption by an average of 3,500 MW during the summer of 2001 (CEC 2001a). In addition, voluntary conservation measures adopted by residential and commercial/industrial users in response to the current energy situation led to a 7.5 percent drop in electricity use throughout the state as of August 2001, but that dropped to 1.5 percent in October 2001 (CEC 2001a). There was a 0.7 percent increase in energy used February 2002 compared to February 2001 (CEC 2002). However, in comparison to February 2000, there was a 5.5 percent decrease in energy consumption in February 2002 (CEC 2002).

GENERATION TECHNOLOGY ALTERNATIVES

Staff considered several alternative generation technologies that do not burn fossil fuels (solar, wind, biomass, geothermal, and hydropower), as well as alternative fossil fuel technology (coal and oil). These technologies are discussed below.

Solar Generation

There are two types of solar generation: solar thermal power and photovoltaic (PV) power generation.

Solar thermal power generation involves the conversion of solar radiation to thermal energy, which is then used to run a conventional steam power system. Solar thermal is a viable alternative to conventional generation systems and, depending on the technology, is suited to be either distributed generation on the kW scale, or centralized

power generation on scales up to several hundred MW. Solar thermal systems utilize three designs to generate electricity: parabolic trough concentrating collectors; power tower/heliostat configurations; and, parabolic dish collectors. Parabolic trough and power tower systems typically run conventional power units, such as steam turbines, while parabolic dish systems power a small engine at the focal point of the collector.

PV power generation involves the direct conversion of light to electricity. PV is best suited to distributed generation uses rather than centralized power generation. PV is the most capital intensive of any alternative generation technology. PV power systems consist of solar electric modules (built from PV cells) assembled into arrays of varying sizes to produce electric power proportional to the area of the array and the intensity of the sunlight. PV arrays can be mounted on either the ground or on buildings. They can be installed on dual-purpose structures such as covered parking lots.

Solar resources would require large land areas in order to generate 670 MW of electricity. Specifically, assuming location in an area receiving maximum solar exposure (such as desert areas of San Bernardino County), central receiver solar thermal projects require approximately five acres per MW, consequently, 670 MW would require approximately 3,350 acres, in comparison to the proposed project's 45.8 acres of land. At 10 percent sun conversion efficiency, PV generation requires one square kilometer (about 400 acres) to produce at least 100 MW; consequently, approximately 2,680 acres would be necessary to produce 670 MW.

Although air emissions are significantly reduced or eliminated for solar facilities, they can have significant visual effects. Solar generation results in the absence or reduction in air pollutant emissions and visible plumes. Water consumption for solar generation is substantially less than for a natural gas fired plant because there is no thermal cooling requirement.

Like all technologies generating power for sale into the State's power grid, solar thermal facilities and PV generation require close access to transmission lines. Large solar thermal plants must be located in desert areas with high direct normal insolation, and in these remote areas, transmission availability is limited. Additionally, solar energy technologies cannot provide full-time availability due to the natural intermittent availability of sunlight. Therefore, solar energy technologies do not meet the project needs, which is to supply baseload power on a continuous basis.

Wind Generation

Wind carries kinetic energy that can be utilized to spin the blades of a wind turbine rotor and an electrical generator, which then feeds alternating current (AC) into the utility grid. Most state-of-the-art wind turbines operating today convert 35 to 40 percent of the wind's kinetic energy into electricity. Modern wind turbines represent viable alternatives to large bulk power fossil power plants as well as small-scale distributed systems. The range of capacity for an individual wind turbine today ranges from 400 watts up to 3.6 MW. California's 1,700 MW of wind power represents 1.5 percent of the state's electrical capacity.

Although air emissions are significantly reduced or eliminated for wind facilities, they can have significant visual effects and wind turbines also cause bird mortality (especially for raptors) resulting from collision with rotating blades.

Wind resources would require large land areas in order to generate 670 MW of electricity. Depending on the size of the wind turbines, wind generation "farms" generally can require between five and 17 acres to generate one megawatt (resulting in the need for between 3,350 and 11,390 acres to generate 670 MW) (CEC 2001b). Although 7,000 MW of new power wind capacity could cost-effectively be added to California's power supply, the lack of available transmission access is an important barrier to wind power development (Beck 2001). California has a diversity of existing and potential wind resource regions that are near load centers such as San Francisco, Los Angeles, San Diego and Sacramento (CEC 2001c). However, wind energy technologies cannot provide full-time availability due to the natural intermittent availability of wind resources. Therefore, wind generation technology would not meet the project's goal, which is to provide baseload power on a continuous basis.

Biomass Generation

Biomass generation uses a waste vegetation fuel source such as wood chips (the preferred source) or agricultural waste. The fuel is burned to generate steam. Biomass facilities generate substantially greater quantities of air pollutant emissions than natural gas burning facilities. In addition, biomass plants are typically sized to generate less than 20 MW, which is substantially less than the capacity of the 670 MW IEEC project. At the peak of biomass industry, 66 biomass plants were in operation in California; however, there are currently only an estimated 30 direct-combustion biomass facilities in operation (CEC 2001d).

In order to generate 670 MW, which is proposed for the IEEC, approximately thirty-four 20 MW biomass facilities would be required. However, these power plants would have potentially significant environmental impacts of their own, including: air quality emissions; the generation of liquid wastes that require careful monitoring and treatment; the generation of large quantities of ash that require recycling and/or disposal; the need for a significantly larger operational staff due to the labor-intensive nature of such facilities, which may, in turn, affect long-term local and regional land use and socioeconomic variables; and the need for significant areas of land for the facilities themselves, as well as the needed crop production, which could lead to existing and planned land use conflicts and the destruction of habitat.

Geothermal

Geothermal technologies use steam or high-temperature water (HTW) obtained from naturally occurring geothermal reservoirs to drive steam turbine/generators. There are vapor dominated resources (dry, super-heated steam), and liquid-dominated resources where various techniques are utilized to extract energy from the HTW. Geothermal power is a commercially available technology; however, it is geographically limited to areas having geologic conditions that result in high subsurface temperatures.

Hydropower

While hydropower does not require burning fossil fuels and may be available in California, this power source can cause significant environmental impacts due to the inundation of many acres of potentially valuable habitat, and interference with fish

movements during their life cycles. As a result of these impacts, it is extremely unlikely that new hydropower facilities could be developed and permitted in California within the next several years.

COAL AND OIL

Coal and oil are alternative power plant fuel technologies that are available within California. Coal is fairly easy to transport, has a high net useful energy yield, and is technologically well developed. However, the burning of coal is considered to be highly polluting, and can cause significant air quality impacts. Air quality emissions from the burning of coal include sulfur oxides, nitrogen oxides, particulate matter, carbon dioxide and cancer-causing substances. In addition, the mining of coal causes several environmental impacts, including air pollution, water pollution (acid mine drainage and dissolved solids from washing), and the elimination of other environmental resources when surface strip mining is proposed. Oil also has a useful net energy yield, is technologically well developed, and is readily transported through pipelines. However, this resource additionally has potentially significant impacts, including, among others, air quality emissions of sulfur oxides, nitrogen oxides and hydrocarbons when burned as a fuel, and the environmental and social effects associated with pipeline ruptures and leaks. The burning of natural gas is cleaner (less polluting) than either coal or oil burning, and is considered to be the preferred alternative for plant fuel.

Conclusion Regarding Alternative Technologies

Alternative generation typically provides lower efficiencies, has specific resource needs, environmental impacts, permitting difficulties, and intermittent availability. Therefore, they do not fulfill the basic objective of this plant: to provide reliable baseload power in order to ensure reliability for electricity in California. Consequently, staff does not believe that these renewable technologies present feasible alternatives to the proposed project.

OTHER ALTERNATIVES CONSIDERED IN THE AFC

The AFC considers several other alternatives, including: (1) an alternative natural gas pipeline route; (2) alternative water supplies; (3) alternative transmission line routes; (4) alternative power generation technologies; (5) alternative fuel technologies; (6) alternative combustion turbine technologies; (7) alternative nitrogen oxides (NO_X) technologies; (8) alternative inlet air technologies; and, (9) alternative cooling technologies.

The alternative natural gas pipeline route would involve construction of a new, 14.8 mile, 20-inch diameter pipeline connecting to a main Southern California Gas transmission pipeline located at Sempra's Moreno Valley compressor station (Calpine, 2001a). This alternative pipeline would generally run north/northeast of the facility between the San Jacinto River and lands to the river's eastern bank. The line would cross the river at approximately Milepost 9.5. This alternative would not require construction of the compressor station associated with the proposed natural gas route. Construction of the alternative route would result in significantly greater earth disturbance than the proposed pipeline route (0.9 mile in length), and therefore could significantly increase potential environmental impacts. Operation of the alternative line

may increase, due to length, diameter and pressure, potential impacts associated with risk of upset, such as pipeline leaks and ruptures. Therefore, staff concludes that the proposed route is preferable to its alternative.

Alternative water supply options evaluated in the AFC include the use of brackish waters, recycled water, and dry and hybrid (wet-dry) cooling technology. The **SOIL and WATER RESOURCES** section of this PSA provides a detailed evaluation of possible options for alternative water supplies to reduce the IEEC's water demand. These options include the use of brackish groundwater supplies, increasing the cycles of concentration of cooling water, the use of reclaimed storm water, and the use of a Zero-Liquid Discharge (ZLD) System. In this evaluation staff has concluded that none of the above-referenced options would be appreciably superior to the proposed project. Staff has additionally concluded that the use of recycled water would have a cumulatively net positive effect on improving groundwater concentrations in localized areas of the West San Jacinto Groundwater Basin.

The AFC considered only the proposed transmission line route to the SCE Valley Substation because the proposed route can be accommodated within the existing SCE transmission line corridor. Staff concurs with the AFC that placement of the proposed transmission line within the existing utility corridor would reduce potential impacts associated with construction of a new corridor. Please refer to the **TRANSMISSION SYSTEM ENGINEERING** section of this PSA for additional information on the proposed transmission line.

Alternative power generation technologies evaluated in the AFC include conventional boiler and steam turbines, simple cycle combustion turbines, conventional combined cycle turbines (the proposed alternative), Kalina combined cycle technology, and advanced combustion turbine cycles. The AFC concludes that the conventional combined cycle turbine alternative is the preferred option because of its high efficiency rates and low air emission rates per kilowatt-hour generated (Calpine, 2001a). Please refer to the **FACILITY DESIGN** and **POWER PLANT EFFICIENCY** sections of this PSA for additional information on these technologies.

Alternative fuel technologies addressed in the AFC include geothermal and hydroelectric resources, biomass, solar and wind technologies, and coal and oil technologies. Please refer to the **GENERATION TECHNOLOGY ALTERNATIVES** section of this analysis for staff's conclusions regarding these technologies.

Alternative combustion turbines assessed in the AFC include conventional, advanced (the proposed alternative), and next generation technologies. The PSA concludes that advanced combustion turbines offer higher efficiencies, and now have reduced emission levels in comparison to older power plants. Please refer to the **AIR QUALITY**, **FACILITY DESIGN**, and **POWER PLANT EFFICIENCY** sections of this PSA for additional information on these technologies.

Alternative NO_X control technologies considered in the AFC include steam injection, water injection, and dry low NO_X combustors (the proposed alternative). Dry low NO_X combustors were selected in the AFC because they provide for lower NO_X emissions and lower demineralized water requirements (Calpine, 2001a). Post-combustion NO_X

control alternatives presented in the AFC include a selective catalytic reduction (SCR) control system (the proposed alternative) and $SCONO_X$ ™ technology. The proposed alternative was selected in the AFC because the $SCONO_X$ ™ technology is new and does not have a commercially demonstrated viability for large power plants (Calpine, 2001a). Reducing agent alternatives evaluated in the AFC for the SCR technology include anhydrous ammonia, aqueous ammonia (the proposed alternative), and urea. Anhydrous ammonia was dropped from consideration in the AFC because its hazardous nature is typically of greater public concern than aqueous ammonia; urea was dropped from further consideration because it has not been commercially demonstrated as a viable reducing agent for SCR technology (Calpine, 2001a). Please refer to the **AIR QUALITY**, **PUBLIC HEALTH**, **HAZARDOUS MATERIALS MANAGEMENT**, **FACILITY DESIGN**, and **POWER PLANT EFFICIENCY** sections of this PSA for additional information on these technologies.

Alternative inlet air cooling technologies addressed in the AFC include evaporative cooling, inlet fogging (the proposed alternative), and air chilling. The inlet fogging technology is proposed in the AFC to optimize output efficiency versus capital cost (Calpine, 2001a). The AFC notes, however, that the air chilling alternative may be proposed in the future if warranted by market conditions (Calpine, 2001a). Please refer to the **AIR QUALITY**, **FACILITY DESIGN**, and **POWER PLANT EFFICIENCY** sections of this PSA for additional information on these technologies.

The alternative cooling technology presented in the AFC is dry cooling (wet cooling is proposed). Dry cooling was rejected by the Applicant because: (1) dry cooling would reduce the IEEC's net electrical output; (2) dry cooling would reduce the facility's efficiency; and, (3) the capital cost for dry cooling is higher than for wet cooling (Calpine, 2001a). It is noted, that hybrid (wet-dry) cooling is also considered in the AFC as a water supply alternative. Please refer to the **SOIL and WATER RESOURCES**, **FACILITY DESIGN** and **POWER PLANT EFFICIENCY** sections of this PSA for discussions on the viability of these alternatives.

CONCLUSIONS

Staff does not believe that alternative technologies (geothermal, solar, wind, biomass, geothermal and hydroelectric) currently present feasible alternatives to the proposed project. While the No Project Alternative would eliminate all impacts of this project, the benefits of increasing in-state generation would also not be achieved and environmental impacts could be shifted to other locations.

Alternative Sites 5 and 6 would relocate the facility a substantial distance away from densely populated areas and, therefore, would substantially reduce potential impacts to some land use-related issues; these sites additionally have the benefit of being located near existing natural gas pipeline and transmission line corridors. However, these alternatives have constraints, such as potential zoning inconsistencies, the need for additional transmission line interconnections, water supply, and possibly the inability to acquire or lease the properties. Alternative Sites 1 and 2 and the eastern properties of Alternative Site 3 would relocate the facility slightly further away from the more densely populated areas of Romoland, which may result in a minor benefit. Alternative Site 4

meets the criteria needed for the facility and has the necessary zoning; however, this site and the western properties of Alternative Site 3 would place the facility slightly closer to the more densely populated areas of Romoland, which would be considered a disadvantage. Overall, staff concludes that these alternative sites do not offer any appreciable merit over the proposed site. Therefore, no site alternative is recommended over the proposed project site.

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GENERAL CONDITIONS
INCLUDING
COMPLIANCE MONITORING AND CLOSURE PLAN

Connie Bruins

INTRODUCTION

The project General Conditions Including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in compliance with air and water quality, public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission (Energy Commission) and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of the following elements:

1. General conditions that:
   - 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;
   - state procedures for settling disputes and making post-certification changes;
   - state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions; and
   - establish requirements for facility closure plans.
2. Specific Conditions of Certification:
   - Specific Conditions of Certification that follow each technical area contain the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of assuring that the condition has been satisfied.

GENERAL CONDITIONS OF CERTIFICATION

DEFINITIONS

To ensure consistency, continuity and efficiency, the following terms, as defined, apply to all technical areas, including Conditions of Certification:

SITE MOBILIZATION:

Moving trailers and related equipment onto the site, usually accompanied by minor ground disturbance, grading for the trailers and limited vehicle parking, trenching for utilities, installing utilities, grading for an access corridor, and other related activities. Ground disturbance, grading, etc. for site mobilization are limited to the portion of the site necessary for placing the trailers and providing access and parking for the occupants. Site mobilization is for temporary facilities and is, therefore, not considered construction.

GROUND DISTURBANCE:

Onsite activity that results in the removal of soil or vegetation, boring, trenching or alteration of the site surface. This does not include driving or parking a passenger vehicle, pickup truck, or other light vehicle, or walking on the site.

GRADING:

Onsite activity conducted with earth-moving equipment that results in alteration of the topographical features of the site such as leveling, removal of hills or high spots, or moving of soil from one area to another.

CONSTRUCTION:

[From section 25105 of the Warren-Alquist Act.] Onsite work to install permanent equipment or structures for any facility. Construction does **not** include the following:

a. the installation of environmental monitoring equipment;

b. a soil or geological investigation;

c. a topographical survey;

d. any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility, or

e. any work to provide access to the site for any of the purposes specified in a., b., c., or d.

START OF COMMERCIAL OPERATION

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

COMPLIANCE PROJECT MANAGER RESPONSIBILITIES

A Compliance Project Manager (CPM) will oversee the compliance monitoring and shall be responsible for:

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

2. resolving complaints;

3. processing post-certification changes to the conditions of certification, project description, 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 Energy Commission and will consult with appropriate responsible agencies and the Energy 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 the approval will involve all appropriate staff and management.

The Energy Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Energy Commission about power plant construction or operation-related questions, complaints or concerns.

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 Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements and milestones contained in the Energy 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 Energy Commission conditions will not delay the construction and operation of the plant due to oversight and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

Energy Commission Record

The Energy Commission shall maintain 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 Energy Commission; and

4. all petitions for project or condition changes and the resulting staff or Energy Commission action.

PROJECT OWNER RESPONSIBILITIES

It is the responsibility of the project owner 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 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 reopening of the case and revocation of Energy Commission certification, an administrative fine, or other action as appropriate.

Access

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

Compliance Record

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.

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

Compliance Verifications/Submittals

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission’s procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified as necessary by the CPM, and in most cases without full Energy Commission approval.

Verification of compliance with the conditions of certification can be accomplished by:

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;

providing appropriate letters from delegate agencies verifying compliance;
Energy Commission staff audits of project records; and/or
Energy Commission staff inspections of mitigation and/or other evidence of mitigation.

Verification lead times (e.g., 90, 60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the 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
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814

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

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 will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

Compliance Matrix

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide the CPM with the current status of all 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., 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,;
7. the compliance status of each condition (e.g., “not started”, “in progress” or “completed” (include the date); and
8. the project’s preconstruction and construction milestones, including dates and status.

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

Pre-Construction Matrix

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

Construction and Operation Security Plan

Prior to commencing construction, a site specific Security Plan for the construction phase shall be developed and maintained at the project site. Prior to commercial operation, a site specific Security Plan for the operational phase shall be developed and maintained at the project site. The plans may be reviewed at the site by the CPM during compliance inspections. The Security Plans should address the following measures:

Construction **S**ecurity **P**lan

1. Site fencing enclosing the construction area

2. Use of Security Guards

3. Check in procedure or tag system for construction personnel and visitors

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

5. Evacuation procedures

Operation Security Plan

1. Permanent site fencing and security gate

2. Security alarm for critical structures

3. Perimeter breach detectors and onsite motion detectors

4. Video/Camera monitoring system

5. Fire Alarm monitoring system

The CPM may authorize modifications to these measures, or may require additional measures.

Tasks Prior to Start of Construction

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Various lead times (e.g., 30, 60, 90 days) for submittal of compliance verification documents to the CPM for conditions of certification are established to allow sufficient staff time to review and comment and, if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

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

Project owners frequently anticipate starting project construction as soon as the project is certified. In those cases, it may be necessary for the project owner to file compliance submittals prior to project certification if the required lead-time for a required compliance event extends beyond the date anticipated for start of construction. It is also important that the project owner understand that the submittal of compliance documents prior to project certification is at the owner's own risk. Any approval by Energy Commission staff is subject to change based upon the final Decision

Monthly Compliance Report

The first Monthly Compliance Report is due the month following the Energy Commission business meeting date on which the project was approved, unless otherwise agreed to by the CPM. 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 found at the end of this section.

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

1. a summary of the current project construction and milestones 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 and preconstruction and construction milestones (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 and milestones that 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. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification or milestones;

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

10. any requests to dispose of items that are required to be maintained in the project owner's compliance file; and

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

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 reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by the CPM. Each Annual Compliance Report shall 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;

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 Energy Commission or cleared by the CPM;

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

6. a listing of filings 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'

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]; and

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

Confidential Information

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

Department of Fish and Game Filing Fee

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

Reporting of Complaints, Notices, and Citations

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

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt, to the CPM. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form on the following page.

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME:
AFC Number:

COMPLAINT LOG NUMBER _____
Complainant's name and address:

Phone number:

Date and time complaint received:

Indicate if by telephone or in writing (attach copy if written):
Date of first occurrence:

Description of complaint (including dates, frequency, and duration):

Findings of investigation by plant personnel:

Indicate if complaint relates to violation of a CEC requirement:
Date complainant contacted to discuss findings:

Description of corrective measures taken or other complaint resolution:

Indicate if complainant agrees with proposed resolution:
If not, explain:

Other relevant information:

If corrective action necessary, date 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: _____ Date:

(Attach additional pages and supporting documentation, as required.)

CONSTRUCTION MILESTONES

The following is the procedure for establishing and enforcing milestones, which include milestone dates for pre-construction and construction phases of the project. As noted in the **Air Quality** section of this PSA, the use of Priority Reserve emission reduction credits would require the applicant to be fully and legally operational within three years of the Commission's final decision. Therefore, construction milestones have been included as noted below. This issue will be revisited in the Final Staff Assessment (FSA) depending on the applicant's final offset strategy and issuance of the Final Determination of Compliance (FDOC) by South Coast Air Quality Management District (SCAQMD). Milestones and method of verification must be established and agreed upon by the project owner and the CPM no later than 30 days after docketing of the Commission's final decision. If this deadline is not met, the CPM will establish the milestones.

I. ESTABLISH PRE-CONSTRUCTION MILESTONES TO ENABLE START OF CONSTRUCTION WITHIN ONE YEAR OF CERTIFICATION

1. Obtain site control.
2. Obtain financing.
3. Mobilize site.
4. Begin rough grading for permanent structures (start of construction).

II. ESTABLISH CONSTRUCTION MILESTONES FROM DATE OF START OF CONSTRUCTION

1. Begin pouring major foundation concrete.
2. Begin installation of major equipment.
3. Complete installation of major equipment.
4. Begin gas pipeline construction.
5. Complete gas pipeline interconnection.
6. Begin T-line construction.
7. Complete T-line interconnection.
8. Begin commercial operation within three years of the Commission's final decision.

The CPM will negotiate the above-cited pre-construction and construction milestones with the project owner based on an expected schedule of construction. The CPM may agree to modify the final milestones from those listed above at any time prior to or

during construction if the project owner demonstrates good-cause for not meeting the originally-established milestones. Otherwise, failure to meet milestone dates without a finding of good cause is considered cause for possible forfeiture of certification or other penalties.

III. A FINDING THAT THERE IS GOOD CAUSE FOR FAILURE TO MEET MILESTONES WILL BE MADE IF ANY OF THE FOLLOWING CRITERIA ARE MET:

1. The change in any milestone does not change the established commercial operation date milestone.

2. The milestone will be missed due to circumstances beyond the project owner's control.

3. The milestone will be missed, but the project owner demonstrates a good-faith effort to meet the project milestone.

4. The milestone will be missed due to unforeseen natural disasters or acts of God which prevent timely completion of the milestones.

5. The milestone will be missed due to requirements of the California ISO to maintain existing generation output.

If a milestone date cannot be met, the CPM will make a determination whether the project owner has demonstrated good cause for failure to meet the milestone. If the determination is that good cause exists, the CPM will negotiate revised milestones.

If the project owner fails to meet one or more of the established milestones, and the CPM determines that good cause does not exist, the CPM will make a recommendation to the Executive Director. Upon receiving such recommendation, the Executive Director will take one of the following actions:

1. Conclude that good cause exists and direct that revised milestones be established; or

2. Issue a reprimand, impose a fine, or take other appropriate remedial action and direct that revised milestones be established; or

3. Recommend, after consulting with the Siting Committee, that the Energy Commission issue a finding that the project owner has forfeited the project's certification.

The project owner has the right to appeal a finding of no good cause, or any recommended remedial action to the full Energy Commission.

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made that provide the flexibility to deal with the specific situation and project setting that exist at the time of closure. Laws, Ordinances, Regulations and Standards (LORS) pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

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

PLANNED CLOSURE

A 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

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

UNEXPECTED PERMANENT CLOSURE

An unplanned unexpected permanent 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 to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least 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 Energy Commission.
The plan shall:

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

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

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

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

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

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

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

UNEXPECTED TEMPORARY CLOSURE/ON-SITE CONTINGENCY PLAN

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

The project owner, in consultation with the CPM, will update the onsite contingency plan as necessary. The CPM may require revisions to the onsite contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the onsite contingency plan, and recommend

changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

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

In addition, consistent with requirements under unexpected permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the onsite 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 temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the onsite contingency plan. The project owner shall keep the CPM informed of the circumstances and expected duration of the closure.

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

UNEXPECTED PERMANENT CLOSURE

The onsite contingency plan required for unexpected temporary closure shall also cover unexpected permanent facility closure. All of the requirements specified for unexpected temporary closure shall also apply to unexpected permanent closure.

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

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

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

CBO DELEGATION AND AGENCY COOPERATION

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

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

ENFORCEMENT

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Energy Commission Decision. The specific action and amount of any fines the Energy Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, oversight, unforeseeable events, and other factors the Energy Commission may consider.

Moreover, to ensure compliance with the terms and conditions of certification and applicable LORS, 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 Energy Commission pursuant to Title 20, California Code of Regulations, section 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, as described in current State law and regulations, are described below. They shall be followed unless superseded by current law or regulations.

INFORMAL DISPUTE RESOLUTION PROCEDURE

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

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

The 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 Energy 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 Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and within seven working days of the CPM's request, provide a written report of the results of the investigation, including corrective measures proposed or undertaken, to the CPM. 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 48 hours, followed by a written report filed within seven days.

Request for Informal Meeting

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

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

2. secure the attendance of appropriate Energy Commission staff and staff of any other 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 and distribute copies to all in attendance and to the project file, a summary memorandum which fairly and accurately identifies the positions of all parties and any conclusions reached. If an

agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et seq.

FORMAL DISPUTE RESOLUTION PROCEDURE-COMPLAINTS AND INVESTIGATIONS

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution process, such party may file a complaint or a request for an investigation with the Energy Commission's General Counsel. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230 et seq.

The Chairman, upon receipt of a written request stating the basis of the dispute, may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Energy 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 through 1236).

POST CERTIFICATION CHANGES TO THE ENERGY COMMISSION DECISION: AMENDMENTS, INSIGNIFICANT PROJECT CHANGES AND VERIFICATION CHANGES

The project owner must petition the Energy 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; and 3) transfer ownership or operational control of the facility.

A petition is required for **amendments** and for **insignificant project changes**. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the Energy Commission's Docket in accordance with Title 20, California Code of Regulations, section 1209.

The criteria that determine which type of change process applies are explained below.

AMENDMENT

A proposed change will be processed as an amendment if it involves a change to the requirement or protocol, or in some cases the verification portion of a condition of certification, an ownership or operator change, or a potential significant environmental impact.

INSIGNIFICANT PROJECT CHANGE

The proposed change will be processed as an insignificant project change if it does <u>not</u> require changing the language in a condition of certification, have a potential for significant environmental impact, and cause the project to violate laws, ordinances, regulations or standards.

VERIFICATION CHANGE

As provided in Title 20, Section 1770 (d), California Code of Regulations, a verification may be modified by staff without requesting an amendment to the decision if the change does not conflict with the conditions of certification.

KEY EVENTS LIST

PROJECT: _____

DOCKET #: _____

COMPLIANCE PROJECT MANAGER: _____

EVENT DESCRIPTION	DATE
Certification Date	
Online Date	
POWER PLANT SITE ACTIVITIES	
Start Site Mobilization	
Start Ground Disturbance	
Start Grading	
Start Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Combustion of Gas Turbine	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start T/L Construction	
SYNCHRONIZATION WITH GRID	
COMPLETE T/L CONSTRUCTION	
FUEL SUPPLY LINE ACTIVITIES	
Start Gas Pipeline Construction	
COMPLETE GAS PIPELINE CONSTRUCTION	
WATER SUPPLY LINE ACTIVITIES	
START WATER SUPPLY LINE CONSTRUCTION	
COMPLETE WATER SUPPLY LINE CONSTRUCTION	

INLAND EMPIRE POWER PLANT PROJECT
PREPARATION TEAM

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Introduction.....James A. Bartridge

Project Description.....James A. Bartridge

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Biological Resources.....Shari Koslowsky and Natasha Nelson

Cultural Resources.....Roger Mason and Gary Reinoehl

Hazardous Materials.....Alvin J. Greenberg, PH.D. and Rick Tyler

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Socioeconomics.....Sue Walker

Soil and Water.....Greg Peterson and John Kessler

Traffic and Transportation.....Paul Taylor

Transmission Line Safety and Nuisance.....Obed Odoemelam, Ph.D.

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Waste Management.....Alvin J. Greenberg, Ph.D.

Worker Safety and Fire Protection.....Alvin J. Greenberg, Ph.D. and Rick Tyler

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Geology and Paleontology.....Dal Hunter, Ph.D., C.E.G.

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Power Plant Reliability.....Brian Payne

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