Preliminary Staff Assessment

PASTORIA ENERGY FACILITY

Application For Certification (99-AFC-7)
Kern County

CALIFORNIA ENERGY COMMISSION

STAFF REPORT

JULY 2000
(99-AFC-7)

Gray Davis, *Governor*

Preliminary Staff Assessment

PASTORIA ENERGY FACILITY

Application For Certification (99-AFC-7)
Kern County

CALIFORNIA ENERGY COMMISSION

STAFF REPORT

JULY 2000
(99-AFC-7)

Gray Davis, *Governor*

CALIFORNIA ENERGY COMMISSION

SITING OFFICE

Kae C. Lewis
Energy Commission Project Manger

Robert Haussler,
Manager

ENERGY FACILITIES SITING & ENVIRONMENTAL PROTECTION DIVISION

Robert L. Therkelsen
Deputy Director

EXECUTIVE SUMMARY

Kae C. Lewis

INTRODUCTION

This Preliminary Staff Assessment (PSA) contains the California Energy Commission (Energy Commission) staff's evaluation of the Pastoria Energy Facility, LLC's (the Applicant) Application for Certification (AFC) (99-AFC-7) for the Pastoria Energy Facility (PEF). The PEF electric generating plant and related facilities, such as the electric transmission line, natural gas pipeline and water lines, are under the Energy Commission's jurisdiction and cannot be constructed or operated without the Energy Commission's certification.

Staff is an independent party in the proceedings. This PSA is a staff document, presenting staff's independent analysis. It examines engineering and environmental aspects of the PEF, based on the information available at that time of document creation. The PSA contains analyses similar to those contained in Environmental Impact Reports required by the California Environmental Quality Act (CEQA). It is not a Committee document nor is the PSA a final or proposed decision on the proposal. The PSA presents staff's conclusions and proposed conditions which apply to the design, construction, operation, and closure of the proposed facility, if certified.

BACKGROUND

On November 30, 1999, the applicant filed an AFC with the Energy Commission to construct and operate the PEF. On January 12, 2000 the Energy Commission determined that the application should not be accepted due to data inadequacies. On January 4, 2000, the applicant filed supplemental information to address the list of data inadequacies adopted by the Energy Commission. The Energy Commission deemed the application complete at its January 26 business meeting. The analyses contained in this PSA are based upon information from: 1) the AFC; 2) subsequent amendments; 3) responses to data requests, workshops and site visits; 4) supplementary information from federal, state and local agencies; and 5) existing documents and publications.

PROJECT DESCRIPTION

The proposed PEF project site is about 30 miles south of Bakersfield, California, on the Tejon Ranch at the base of the Tehachapi Mountains. The site is 6.5 miles east of Interstate 5 at Grapevine. The site is approximately 30 acres in size and is located in a part of Township 10 North, Range 18 West, which is a historic land grant area (El Tejon). The proposed site is located approximately 0.85 mile north of the California Aqueduct and about 0.75 miles north of the Edmonston Pumping Plant (California Department of Water Resources). The site is currently undeveloped and vegetated with non-native grassland, and is used for cattle

grazing. See **PROJECT DESCRIPTION Figure 1** for the regional setting of the project.

PROJECT DESCRIPTION Figure 2 shows the vicinity of the proposed power plant and the proposed linear (related) facilities routes (transmission line; natural gas and raw water supply pipelines). The power plant would be located on a 30 acre site of previously undisturbed land (except for cattle grazing) within the boundaries of Tejon Ranch. The major PEF project components will be:

- approximately 30 acre power plant site and an onsite sanitary waste treatment facility
- approximately 25 acre construction laydown area
- a new, 1.38 mile 230 kV electrical transmission line connecting a new high voltage switchyard located at the proposed power facility to Southern California Edison's Pastoria substation located south of the project
- a new, 0.2 mile water supply pipeline from the existing Wheeler Ridge-Maricopa Water Storage District (via the California Aqueduct) to the power plant site
- a new 11.65 mile, 16-20 inch diameter fuel gas line from the power plant site north to the interstate Mojave-Kern River pipeline
- a new, 0.85 mile access road to provide access to the site from the Edmonston Pumping Plant Road
- storm water detention ponds at the power plant site

The major features of the PEF power plant are the two power trains with three natural gas fired, F-class combustion turbine generators (CTG), each 168 MW, operating in combined cycle mode. Two CTGs will be installed in a two-on-one configuration with one steam turbine generator (STG) at 185 and one CTG will be installed in a one-on-one configuration with one STG at 90 MW. The heat from hot exhaust gas which flows from each CTG through a heat recovery steam generator (HRSG) is extracted to produce steam to power the STG. The PEF will use 24 cooling towers arranged in two tower banks. The cooling towers are expected to be standard, induced draft counter-flow type. The 64-foot towers will incorporate plume abatement coils and high efficiency drift eliminators. The control of NO_x emissions within the gas turbines will be achieved using XONON™ emission control as Best Available Control Technology (BACT). The PEF plant is expected to have an overall availability of 95 percent.

The project will connect to Southern California Edison's (SCE) 230 kilovolt (kV) network at the existing Pastoria substation with a 1.38 mile long, double circuit transmission line interconnection from the proposed plant switchyard. The majority of the proposed line parallels an existing transmission corridor. Its proposed steel lattice towers are expected to have a maximum height of 120 feet. See **PROJECT DESCRIPTION Figure 2** for the location of the plant transmission line.

The proposed PEF project will use natural gas supplied through an 11.65 mile, 16-20 inch diameter interconnection pipeline to the existing 42 inch diameter pipeline jointly owned by the Kern River Gas Transmission Company and the Mojave Pipeline Company which is pressurized at 700-900 psig. The pipeline route runs northeast of the plant site. The project will utilize up to an estimated 120 million standard cubic feet per day of pipeline quality natural gas. The proposed gas line route (referred to as Route 3) is shown on **PROJECT DESCRIPTION Figure 2.**

PEF is proposing to contract its water supply from the Wheeler Ridge-Maricopa Water Storage District (WRMWSD or District) under a new rate for large industrial customers. Supplies from WRMWSD will come from the California Aqueduct at a tie-in located about one mile southwest of the PEF site and delivered through an existing District pipeline network and a new 0.2 mile water supply line (see **Project Description** Figure 2). The project has the option to purchase up to 5,000 acre feet of water from WRMWSD's "pool water" which is made available when other District customers do not take their full entitlement. The PEF is contracting with a water broker (Azurix) for the purchase of back-up groundwater supplies via exchange agreements with water districts in the Kern County Water Agency.

To dispose of process wastewater, PEF proposes to use a wastewater management system which incorporates treatment for zero liquid discharge (ZLD). The ZLD system will process all wastewater streams from the plant except sanitation and stormwater streams. The ZLD process which concentrates the dissolved and suspended constituents in the wastewater through a combination of evaporation and crystallization will result in two to eight cubic yards per day of non-hazardous salt cake. The ZLD process system is expected to consist of filtration, an evaporator-condenser, a brine crystallizer, and related equipment such as mixing tanks and pumps. Sanitary wastewater from sinks, toilets, and other sanitary facilities will be disposed of onsite by a septic system and leach field.

The PEF project is estimated to have a capital cost of about $400 million. The applicant plans to complete construction and start operation of the PEF project by mid-2003. The project will contribute to the local economy by creating 325 construction jobs at the peak period and approximately 25 permanent jobs to operate and maintain the power plant. Construction is expected to take two years.

STAFF'S ASSESSMENT

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

- the project's conformity with integrated assessment of need;
- 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;
- compliance of the project with all applicable laws, ordinances, regulations and standards (LORS) during construction and operation; and
- proposed conditions of certification, where these can be identified at this time.

The staff has been able to complete its analyses and make a preliminary recommendation in the fifteen topic areas listed in the table below. In five topic areas (air quality, biological resources, land use, soil and water resources, and visual resources) staff's analyses will be incomplete and a preliminary recommendation on the project will not be included in this PSA.

COMPLETE ANALYSES

Staff believes its analysis of the power plant is substantially complete for the following 15 technical areas:

Alternatives	Socioeconomics
Cultural Resources	Traffic & Transportation
Efficiency	Trans. Line Safety & Nuisance
Facility Design	Trans. System Engineering
Geology & Paleontology	Waste Management
Hazardous Materials	Worker Safety & Fire Protection
Reliability	General Conditions/Compliance
Public Health	

In each of these topic areas staff believes that if recommendations and conditions of certification are implemented, the PEF project will be in compliance with the applicable LORS, and no significant adverse direct, indirect, or cumulative impacts will occur.

All of these topic areas will be the subjects of workshop discussions. Staff's conclusions, recommendations and proposed conditions of certification for these topic areas may be modified based on those workshop discussions. In addition, staff may recommend mitigation measures to address issues in air quality, biological resources, land use, soil and water resources, and visual resources that may require staff to reevaluate its conclusions and recommendations for the above topic areas.

INCOMPLETE ANALYSIS AND UNRESOLVED ISSUES

Five technical areas are considered incomplete because they have unresolved issues: air quality, biological resources, land use, soil and water resources, and visual resources. These areas may have potentially significant environmental impacts. If so, these impacts may be able to be fully mitigated to less than significant levels. The unresolved issues in these topic areas are presented below:

AIR QUALITY

Because the PEF project will have significant environmental impacts on air quality, mitigations have been proposed. These include using state of the art combustion technology, installing post-combustion control technology, and providing emission reduction credits (ERCs or offsets) as required by San Joaquin Valley Air Pollution Control District (SJVAPCD). The post-combustion control technology proposed by the Applicant is the new XONON system that is not yet a proven technology for the F class turbines proposed for PEF. The Applicant is proposing as an alternative to XONON technology, the use of the SCR (selective catalytic reduction) system to control NO_x emissions. SCR is a process that chemically reduces No_x through an injection of ammonia over a catalyst in the presence of oxygen. This process must occur at certain high temperatures or ammonia emissions can be excessive. The staff recommends that these ammonia emissions or “slip” be limited to 5 ppm which is less than the Applicant’s proposed ammonia slip of 10 ppm. This recommendation is consistent with recent directives from both the California Air Resources Board and the US Environmental Protection Agency.

BIOLOGICAL RESOURCES

Important biological resources issues are currently unresolved. Because the PEF project site is in an area deemed to be San Joaquin kit fox habitat, the Applicant must comply with the federal Endangered Species Act (ESA). The U.S. Fish and Wildlife Service (USFWS) has directed that PEF must provide a Habitat Conservation Plan (HCP) as required under Section 10 (ESA). This plan must provide (a) permanent conservation set-aside for the power plant site to mitigate for temporary and permanent disruption to endangered species (kit fox) habitat, and (b) an additional open space easement near the power plant to mitigate for the potential taking of habitat within the kit fox movement corridor. To comply with its ESA obligations, PEF is, first, planning to provide funds to purchase permanent compensation habitat in the Lokern Preserve managed by the Center for Natural Lands Management. Second, PEF is currently seeking an open space easement near the power plant site to maintain habitat within the kit fox movement corridor area. PEF must secure this easement from the Tejon Ranch Corporation, the project site landowner. These two actions must be guaranteed before PEF can secure federal authorization for the project to be constructed. In addition, these obligations will be formalized in the following documents: the Habitat Conservation Plan (HCP) and HCP Implementing Agreement, and the Section 10 Biological Opinion from the US Fish and Wildlife Service (USFWS), and permits under the federal and state Clean Water Acts Sections 404 and 401, respectively. The USFWS is currently unable to provide a schedule for their production and review of these documents, thus, federal authorization for this project remains uncertain.

LAND USE

As part of the project, the applicant proposes to create a new 30-acre parcel from sections of two existing parcels. Because PEF will lease land for the proposed plant from the Tejon Ranch Corporation, the Kern County Planning Department determined that PEF must file an application for either a lot line adjustment or parcel map. PEF has submitted a parcel map for the project to Kern County for their review. Under the Kern County Land Division Ordinance, Kern County must provide an opportunity for public participation in the review process for approval of a parcel map. Ultimately, the project must comply with the California Subdivision Map Act and the Kern County Land Division Ordinance. If not in compliance, certification cannot be granted without an override from the Energy Commission.

One of the existing parcels is currently in the Williamson Act. Under the Williamson Act, an owner of agricultural land may enter into a contract with the county whereby the landowner agrees to restrict the use of the land for the production of commercial food or fiber for a term of not less than ten years in exchange for lower property taxes. Cancellation, which involves a comprehensive review and approval process, is necessary if the land is to be used for non-agricultural purposes. The proposed site and laydown area is situated on land that is currently subject to the Williamson Act contract. Kern County may need to rely on environmental documentation provided by Energy Commission staff before they can make the necessary findings for cancellation of the contract.

SOIL AND WATER RESOURCES

The Wheeler Ridge-Maricopa Water Storage District (WRMWSD) will provide the PEF project with its primary water supply. WRMWSD's surface water is from the California State Water Project (SWP) delivered through the California Aqueduct. PEF's industrial water service contract with WRMWSD will guarantee them water only when these SWP surface supplies are not needed by WRMWSD's other (mainly agricultural) customers. This stipulation is significant because the PEF project may only be able to count on surface water from WRMWSD 50–60 percent of the time. To fill this gap, PEF is developing a backup supply of water through the the brokering services of Azurix, a private water management firm. Azurix plans to purchase options to banked groundwater in the aquifer underlying Kern County Water Agency (KCWA). Azurix will use the groundwater to execute exchange agreements with water district members of the KCWA for their State Water Project (SWP) water allocations which will then be delivered to PEF through the California Aqueduct. In turn, the KCWA districts will supply their agricultural customers with banked groundwater in lieu of these surface SWP supplies.

These complex water supply arrangements have many potential significant impacts. Because the Applicant's negotiations are still in the development stage, it has not been possible for the staff to perform a complete analysis. The concerns about PEF's backup water supply include the nature of the conditions and restrictions under which Azurix can purchase and recover banked groundwater; the conveyance arrangements for the backup water supply through capacity in the California Aqueduct; and, the proof of environmental review associated with these banked water supplies and their recovery.

The staff intends to analyze possible alternatives to the wet cooling technology proposed for the PEF cooling tower system. The use of dry or hybrid (wet/dry) cooling is technologically feasible and would reduce water consumption but would have additional capital, operational and maintenance costs. If such a reduction in water use is possible, however, the PEF project may be less dependent upon its backup water supplies.

VISUAL RESOURCES

Visible plumes, which are created by the condensation of water in moist emitted air, are produced by both the heat steam recovery generators (HRSG) and the cooling towers. Plumes from the cooling towers have been determined to result in less than significant visual impacts, however, staff has identified a potential significant impact related to the HRSG stack plumes. Staff has insufficient information to make a determination of significance at this time. Staff anticipates obtaining information on the HRSG stack plumes, and to provide a complete analysis in the Final Staff Assessment (FSA).

STAFF RECOMMENDATION

Staff has identified five technical areas that are incomplete: **Air Quality**, **Biological Resources, Land Use, Soil and Water Resources,** and **Visual Resources.** Although our analysis is potentially complete in 15 areas, resolution of the issues in the other technical areas must be resolved if the Energy Commission is to grant certification of this project. It is the staff's opinion that ultimately the outstanding issues can be resolved and that the environmental impacts can be reduced to less than significant levels.

EXECUTIVE SUMMARY 1
INTRODUCTION 11
PROJECT DESCRIPTION 15
NEED CONFORMANCE 19
AIR QUALITY 21
PUBLIC HEALTH 51
WORKER SAFETY AND FIRE PROTECTION 61
TRANSMISSION LINE SAFETY AND NUISANCE 79
HAZARDOUS MATERIALS MANAGEMENT 91
WASTE MANAGEMENT 105
LAND USE 119
TRAFFIC AND TRANSPORTATION 139
NOISE 167
VISUAL RESOURCES 189
CULTURAL RESOURCES 241
SOCIOECONOMICS 277
BIOLOGICAL RESOURCES 295
SOILS AND WATER RESOURCES 323
GEOLOGY AND PALEONTOLOGY 357
FACILITY DESIGN 371
POWER PLANT RELIABILITY 399
POWER PLANT EFFICIENCY 407
TRANSMISSION SYSTEM ENGINEERING 415
ALTERNATIVES 427
GENERAL CONDITIONS 443
PASTORIA PREPARATION TEAM 461

INTRODUCTION

Kae Lewis

PURPOSE OF THIS REPORT

The Preliminary Staff Assessment (PSA) presents the California Energy Commission (Energy Commission) staff's independent analysis of Pastoria Energy Facility, Limited Liability Company's (the applicant) Application for Certification (AFC). This report is prepared pursuant to sections 1742, 1742.5, 1743, and 1744 of Title 20, California Code of Regulations. The PSA is a staff document; it is not a Committee document nor is it a draft decision or proposed decision. The PSA describes the following:

- the existing environment;
- 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;
- mitigation measures proposed by the applicant, staff, and interested agencies and intervenors which may lessen or eliminate potential impacts;
- the proposed conditions under which the project should be constructed and operated if it is certified; and
- project alternatives.

The analyses contained in this PSA are based upon information from: 1) the AFC; 2) subsequent amendments; 3) responses to data requests; 4) supplementary information from local and state agencies; 5) existing documents and publications; and 6) independent field studies and research. The PSA presents conclusions and proposed conditions that apply to the design, construction, operation, and closure of the proposed facility. 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 Regulations, section 1701 et seq., and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.) and its guidelines (Cal. Code Regs., Title 14, § 15000 et seq.).

ORGANIZATION OF THE PRELIMINARY STAFF ASSESSMENT

The **INTRODUCTION** section of this PSA explains the purpose of the PSA and its relationship to the Energy Commission's siting process. The **PROJECT DESCRIPTION** section of the PSA provides a brief overview of the project including its purpose, location, and major project components.

The environmental and engineering evaluations of the proposed project follow the **PROJECT DESCRIPTION**. This PSA will not contain a **NEED CONFORMANCE** section, since the legislature eliminated the requirement to conduct an integrated assessment of need in Senate Bill 110, enacted in 1999. In the environmental analyses, the project's environmental setting is described, environmental impacts are identified and their significance assessed, and the project's compliance with applicable laws is reviewed. The mitigation measures proposed by the applicant are reviewed for adequacy and conformance with applicable LORS; any remaining unmitigated impacts are identified, and additional mitigation measures and project alternatives are proposed by staff when necessary. Staff's conclusions and recommendations are discussed, and proposed conditions of certification are included, if applicable. In the engineering analyses, the project is evaluated in each technical area with respect to applicable LORS and performance objectives. Staff proposed modifications to the facility, if applicable, are listed. Each technical section ends with a discussion of facility closure, conclusions and recommendations. Proposed conditions of certification are included, 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 Applications for Certification (AFC) to assess potential environmental impacts including potential impacts to public health and safety, potential measures to mitigate those impacts (Pub. Resources Code, section 25519(c), and compliance with applicable governmental LORS (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) which we call a Preliminary Staff Assessment.

In addition, staff must assess the completeness and adequacy of the project's health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, section 1743(b). Staff is required to develop a compliance plan

(coordinated with other agencies) to ensure that applicable LORS, 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 (CEQA). No Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been certified by the Resources Agency (Public Resource Code, section 21080.5, Cal. Code Regs., tit. 14, section 15251(k). The Energy Commission's certified process implements the subjective portions of CEQA.

The staff normally 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. The Final Staff Assessment (FSA) incorporates written comments on the PSA and comments on the PSA received at PSA workshops. The FSA serves as staff's testimony on a proposal.

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 FSA, the staff conduct workshops to discuss our findings, proposed mitigation, and proposed compliance monitoring requirements. Based on these workshops and written comments, staff will refine the analysis, correct errors, and finalize conditions of certification to reflect areas where we have reached agreement with the parties. This FSA will serve as staff's testimony in those area where parties agree that the issues are ready for evidentiary hearings. If there are areas the parties do not believe are ready for hearings, staff may recommend bifurcating the FSA and issue a supplemental final staff assessment.

The staff's assessment is only one piece of evidence that will be considered by the Committee 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 for a minimum of 30 days in order to receive written public comments, and a public hearing may be held to take additional comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. A revised PMPD is required to undergo a 15-day comment period. At the close of the comment period for the revised PMPD, the PMPD is submitted to the full Energy Commission for decision. Following Energy Commission adoption, any party may appeal the decision to the Energy Commission within 30 days.

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. The Energy 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. The proposed Compliance Monitoring Plan and General Conditions are included at the end of the PSA.

PROJECT DESCRIPTION

Kae C. Lewis

NATURE AND PURPOSE OF PROJECT

The Pastoria Energy Facility, Limited Liability Company (referred to as PEF, LLC or the "Applicant") proposes to construct and operate the Pastoria Energy Facility (PEF) a nominal 750 megawatt (MW) natural gas fired, merchant-class electrical generating facility located on Tejon Ranch in southern Kern County. PEF is owned by Pastoria Energy Facility (PEF), Limited Liability Corporation (LLC); PEF, LLC is a subsidiary of Enron North America Corporation. The applicant's objectives which were used to guide the selection of a project location, the equipment to be utilized, and the commercial arrangements for project success are:

- A location that offers access to the California Power Exchange through the California Independent System Operator (CAL-ISO).
- A location that offers access to the greater Los Angeles market for the sale of electric energy.
- A site that has access to sufficient fuel and water at competitive prices.
- A site that is located near an existing transmission line substation.
- A project that utilizes tested and reliable technology, but explores and utilizes new technology where economically and commercially feasible
- A project that will provide a fair return on the project investment.
- A project that will be sufficiently attractive to the investment community so that the required construction funds can be obtained at reasonable rates.

PROJECT LOCATION

The proposed PEF project site is about 30 miles south of Bakersfield, California, on the Tejon Ranch at the base of the Tehachapi Mountains. The site is 6.5 miles east of Interstate 5 at Grapevine. The site is approximately 30 acres in size and is located in a part of Township 10 North, Range 18 West, which is a historic land grant area (El Tejon). The proposed site is located approximately 0.85 mile north of the California Aqueduct and about 0.75 miles north of the Edmonston Pumping Plant (California Department of Water Resources). The site is currently undeveloped and vegetated with non-native grassland, and is used for cattle grazing. See **PROJECT DESCRIPTION Figure 1** for the regional setting of the project.

PROJECT DESCRIPTION

POWER PLANT

PROJECT DESCRIPTION Figure 1 shows the vicinity of the proposed power plant and the proposed linear (related) facilities routes (transmission line; natural gas and raw water supply pipelines). The power plant would be located on a 30 acre site of previously undistrubed land (except for cattle grazing) within the boundaries of Tejon Ranch. The major PEF project components will be:

- approximately 30 acre power plant site and an onsite sanitary waste treatment facility
- approximately 25 acre construction laydown area
- a new, 1.38 mile 230 kV electrical transmission line connecting a new high voltage switchyard located at the proposed power facility to Southern California Edison's Pastoria substation located south of the project
- a new, 0.2 mile water supply pipeline from the existing Wheeler Ridge-Maricopa Water Storage District pipeline to the power plant site
- a new 11.65 mile, 16 inch diameter fuel gas line from the power plant site north to the interstate Mojave-Kern River pipeline
- a new, 0.85 mile access road to provide access to the site from the Edmonston Pumping Plant Road
- storm water detention ponds at the power plant site

The major features of the 750 MW PEF power plant are the two power trains with three natural gas fired, F-class combustion turbine generators (CTG), each 168 MW, operating in combined cycle mode. Two CTGs will be installed in a two-on-one configuration with one steam turbine generator (STG) at 185 and one CTG will be installed in a one-on-one configuration with one STG at 90 MW. The heat from hot exhaust gas which flows from each CTG through a heat recovery steam generator (HRSG) is extracted to produce steam to power the STG. The PEF will use 24 cooling towers arranged in two tower banks. The cooling towers are expected to be standard, induced draft counter-flow type. The 64-foot towers will incorporate plume abatement coils and high efficiency drift eliminators. The control of NO_x emissions within the gas turbines will be achieved using XONON™ emission control as Best Available Control Technology (BACT). The PEF plant is expected to have an overall availability of 95 percent.

TRANSMISSION LINE FACILITIES

The project will connect to Southern California Edison's (SCE) 230 kilovolt (kV) network at the existing Pastoria substation with a 1.38 mile long, double circuit transmission line interconnection from the proposed plant switchyard. The majority of the proposed line parallels an existing transmission corridor. Its proposed steel lattice towers are expected to have a maximum height of 120 feet. See **PROJECT DESCRIPTION Figure 2** for the location of the plant transmission line.

NATURAL GAS PIPELINE

The proposed PEF project will use natural gas supplied through an 11.65 mile, 16-20 inch diameter interconnection pipeline to the existing 42 inch diameter pipeline jointly owned by the Kern River Gas Transmission Company and the Mojave Pipeline Company which is pressurized at 700-900 psig. The pipeline route runs northeast of the plant site. The project will utilize up to an estimated 120 million standard cubic feet per day of pipeline quality natural gas. The proposed gas line route (referred to as Route 3) is shown on **PROJECT DESCRIPTION Figure 1**.

WATER SUPPLY

PEF is proposing to contract its water supply from the Wheeler Ridge-Maricopa Water Storage District (WRMWSD or District) under a new rate for large industrial customers. Supplies from WRMWSD will come from the California Aqueduct at a tie-in located about one mile southwest of the PEF site and delivered through an existing District pipeline network and a new 0.2 mile water supply pipeline (see **PROJECT DESCRIPTION Figure 2**). The project has the option to purchase up to 5,000 acre feet of water from WRMWSD's "pool water" which is made available when other District customers do not take their full entitlement. When this surface water is not available WRMWSD will reserve distribution capacity for the wheeling of groundwater purchased by the applicant as a back-up supply. The PEF is contracting with a water broker (Azurix) for the purchase of back-up groundwater (up to an annual 15,000 acre feet) from districts served by the Kern County Water Agency (KCWA).

WASTEWATER TREATMENT

To dispose of process wastewater, PEF proposes to use a wastewater management system which incorporates treatment for zero liquid discharge (ZLD). The ZLD system will process all wastewater streams from the plant except sanitation and stormwater streams. The ZLD process which concentrates the dissolved and suspended constituents in the wastewater through a combination of evaporation and crystallization will result in two to eight cubic yards per day of non-hazardous salt cake. The ZLD process system is expected to consist of filtration, an evaporator-condenser, a brine crystallizer, and related equipment such as mixing tanks and pumps. Sanitary wastewater from sinks, toilets, and other sanitary facilities will be disposed of onsite by a septic system and leach field.

CONSTRUCTION AND OPERATION

The PEF project is estimated to have a capital cost of about $400 million. The applicant plans to complete construction and start operation of the PEF project by mid-2003. The project will contribute to the local economy by creating 325 construction jobs at the peak period and approximately 25 permanent jobs to operate and maintain the power plant. Construction is expected to take two years. See the **Socioeconomics** chapter of this staff assessment for additional details on project construction schedule and work force necessary to support this project. The overall sequence and start-up includes: site preparation, construction of foundations, erecting major structures, installing major equipment, connecting major

interfaces (pipelines and transmission line), commissioning, and final siting cleanup and landscaping.

NEED CONFORMANCE

The Pastoria Energy Facility Application for Certification was accepted on November 30, 1999. Prior to January 1, 2000, the Public Resources Code prohibited the Energy Commission from certifying a power plant unless the Commission made a finding that the facility was found to be in conformance with the Commission's integrated assessment of the need for new resource additions. (Pub. Resources Code §§ 25523(f) and 25524(a).) The Public Resources Code directed the Commission to do an "integrated assessment of need," taking into account 5- and 12-year forecasts of electricity supply and demand, as well as various competing interests, and to adopt the assessment in a biennial electricity report.

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

> "Before the California electricity industry was restructured the regulated cost recovery framework for power plants justified requiring the commission to determine the need for new generation, and site only power plants for which need was established. Now that power plant owners are at risk to recover their investments, it is no longer appropriate to make this determination."

(Pub. Resources Code, § 25009, added by Stats. 1999, ch. 581, § 1.) Senate Bill 110 takes effect on January 1, 2000 (Cal. Const. Art. 4, § 8.). As of January 1, 2000, the Commission is no longer required to determine if a proposed project conforms with an integrated assessment of need. As a result, an application for certification for which the Commission adopts a final decision after January 1, 2000 is not subject to a finding of "need-conformance."

In this case, the Commission's final decision will be made after January 1, 2000. Therefore, because of SB 110, the Commission will make no finding of "need-conformance" with respect to the proposed project.

AIR QUALITY

Magdy Badr

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 Pastoria Energy Facility (PEF). Criteria air pollutants are defined as those for which a state or federal ambient air quality standard has been established to protect public health. They include nitrogen dioxide (NO2), sulfur dioxide (SO2), carbon monoxide (CO), ozone (O3), volatile organic compounds (VOC), particulate matter less than 10 microns in diameter (PM10) and hydrogen sulfide (H_2S).

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

- whether the PEF is likely to conform with applicable Federal, State and San Joaquin Valley Unified Air Pollution Control District air quality laws, ordinances, regulations and standards, as required by Title 20, California Code of Regulations, section 1744 (b);
- whether the PEF is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards, as required by Title 20, California Code of Regulations, section 1742 (b); and
- whether the mitigation proposed for the PEF is adequate to lessen the potential impacts to a level of insignificance, as required by Title 20, California Code of Regulations, section 1742 (b).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Under the Federal Clean Air Act (42 USCA § 7401 et seq.), there are two major components of air pollution control requirements for stationary sources, New Source Review (NSR) and Prevention of Significant Deterioration (PSD). NSR is a regulatory process for evaluation of those pollutants that violate federal ambient air quality standards. Conversely, PSD is a regulatory process for evaluation of those pollutants that do not violate federal ambient air quality standards. The NSR analysis has been delegated by the Environmental Protection Agency (EPA) to the San Joaquin Valley Unified Air Pollution Control District (District). The EPA determines the conformance with the PSD regulations. The PSD requirements apply only to those projects (known as major sources) that emit more than 100 tons per year for any pollutant.

STATE

The California State Health and Safety Code, section 41700, requires that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerate number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property."

LOCAL

The proposed project is subject to the following San Joaquin Valley Unified Air Pollution Control District (District) rules and regulations:

RULE 2201 - NEW AND MODIFIED STATIONARY SOURCE REVIEW RULE

The main functions of the District's New Source Review Rule are to allow for the issuance of Authorities to Construct, Permits to Operate, the application of Best Available Control Technology (BACT) to new permit sources and to require the new permit source to secure emission offsets.

SECTION 4.1 - BEST AVAILABLE CONTROL TECHNOLOGY

Best Available Control Technology is defined as: a) has been contained in any State Implementation Plan and approved by EPA; b) the most stringent emission limitation or control technique that has been achieved in practice for a class of source, or c) any other emission limitation or control technique which the District's Air Pollution Control Officer (APCO) finds is technologically feasible and is cost effective. BACT will apply to any air pollutant that results in an emissions increase of 2 pounds per day. In the case of the PEF, BACT will apply for NO_x, SO_2, PM10, VOC and CO emissions from all point sources of the project.

SECTION 4.2 - OFFSETS

Emissions offsets for new sources are required when those sources exceed the following emissions levels:

- Sulfur oxides - 150 lbs/day
- PM10 - 80 lb./day
- Oxides of nitrogen - 10 tons/year
- Volatile organic compounds - 10 tons/year

The PEF exceeds all of the above emission levels; therefore offsets are required for all four of these pollutants. The emission offsets provided shall be adjusted according to the distance of the offsets from the project proposed site.

The ratios are:

- Within 15 miles of the same source - 1.2 to 1

- 15 miles or more from the source - 1.5 to 1

Section 4.2.5.3 allows for the use of interpollutant offsets (including PM10 precursors for PM10) on a case-by-case basis, provided that the PEF demonstrates that the emissions increase will not cause a violation of any ambient air quality standard. The ratio for interpollutant trading shall be based on an air quality analysis and shall be equal to or greater than the minimum offsetting requirements (the distance ratios) of this rule.

SECTION 4.3 - ADDITIONAL SOURCE REQUIREMENTS

Rule 4.3.2.1 requires that a new source not cause, or make worse, the violation of an ambient air quality standard as demonstrated through analysis with air dispersion models.

RULE 2520 – FEDERALLY MANDATED OPERATING PERMITS

Requires that a project owner file a Title V Operating Permit from EPA with the District within 12 months of commencing operation. A project is subject to this requirement if any of the following apply: the project is a major stationary source (under PSD definitions), it has the potential to emit greater than 100 tons per year of a criteria pollutant, any equipment permitted is subject to New Source Performance Standards, the project is subject to Title IV Acid Rain program, or the owner is required to obtain a PSD permit from EPA. The Title V permit application requires that the owner submit information on the operation of the air polluting equipment, the emission controls, the quantities of emissions, the monitoring of the equipment as well as other information requirements.

RULE 2540 – ACID RAIN PROGRAM

A project greater than 25 MW and installed after November 15, 1990, must submit an acid rain program permit application to the District. The acid rain requirements will become part of the Title V Operating Program (Rule 2520). The specific requirements for the PEF will be discussed in the “Compliance with LORS – Local” later in this analysis.

RULE 4001 - NEW SOURCE PERFORMANCE STANDARDS

Specifies that a project must meet the requirements of the Federal New Source Performance Standards (NSPS) specified in Title 40, Code of Federal Regulations, Part 60, Chapter 1. Subpart GG, which pertains to Stationary Gas Turbines, requires that NO_x concentrations are a function of the heat rate of the combustion, which in this case would be approximately 116 ppmv at 15% O_2. In addition, the SO_2 concentration shall be less than 150 ppmv and the sulfur content of the fuel shall no greater than 0.8 percent by weight.

RULE 4101 - VISIBLE EMISSIONS

Prohibits air emissions, other than water vapor, of more than Ringelmann No. 1 (20 percent opacity) for more than 3 minutes in any one hour.

RULE 4201 - PARTICULATE MATTER CONCENTRATION

Limits particulate emissions from sources such as the gas turbines, cooling towers and emergency fire water pumps to less than 0.1 grain per cubic foot of exhaust gas at dry conditions.

RULE 4703 - STATIONARY GAS TURBINES

Limits NO_x concentrations to 12.2 ppm for the SCR controlled turbines. In addition there is a limit in CO concentrations of less than 200 ppm.

RULE 4801 - SO_2 CONCENTRATION

Limits the SO_2 concentration emitted into the atmosphere to no greater than 0.2 percent by volume.

RULE 8010 - FUGITIVE DUST ADMINISTRATIVE REQUIREMENTS FOR CONTROL OF FINE PARTICULATE MATTER (PM-10)

Specifies the types of chemical stabilizing agents and dust suppressant materials that can (and cannot) be used to minimize fugitive dust.

RULE 8020 - FUGITIVE DUST REQUIREMENTS FOR CONTROL OF FINE PARTICULATE MATTER (PM-10) FROM CONSTRUCTION, DEMOLITION, EXCAVATION, AND EXTRACTION ACTIVITIES

Requires that fugitive dust emissions during construction activities be limited to no greater than 40 percent opacity by means of water application or chemical dust suppressants. The rule also encourages the use of paved access aprons, gravel strips, wheel washers or other measures to limit mud or dirt carry-out onto paved public roads.

RULE 8030 - CONTROL OF PM10 FROM HANDLING AND STORAGE OF BULK MATERIALS

Limits the fugitive dust emissions from the handling and storage of materials. It specifies that bulk materials be transported using wetting agents, allow appropriate freeboard space in the vehicles, or be covered. It also requires that stored materials be covered or stabilized.

RULE 8060 - CONTROL OF PM10 FROM PAVED AND UNPAVED ROADS

Specifies the width of paved shoulders on paved roads or the use of chemical dust suppressants on unpaved roadways, shoulders and medians.

RULE 8070 - CONTROL OF PM10 FROM VEHICLE/EQUIPMENT PARKING, SHIPPING, RECEIVING, TRANSFER, FUELING AND SERVICE AREAS

This rule is intended to limit fugitive dust from unpaved parking areas by means of using water or chemical dust suppressants or the use of gravel. It also requires that the affected owners/operators shall remove tracked out mud and dirt onto public roadways once a day.

ENVIRONMENTAL SETTING

METEOROLOGICAL CONDITIONS

Hot dry summers and mild winters with relatively small amounts of precipitation typically dominate the climate of the southern San Joaquin Valley. The semi-permanent Pacific High over the eastern Pacific Ocean dominates the weather during the summer months, blocking low pressure systems from passing through the area. The Pacific High, along with the Temblor Range to the west that blocks the marine air influence from the Pacific Ocean, results in summers that are usually quite warm, with average daily maximum temperatures during July of over 98°F.

During the winter months, the Pacific High weakens and migrates to the south allowing Pacific storms into California. The annual rainfall in the Bakersfield area is only 5.7 inches. In between storms, high pressure from the Great Basin High can block storms and result in persistent tule fog caused by temperature inversions. Daily maximums during the December-January months are a relatively mild 57°F, with lows averaging 38°F. At the Maricopa weather station, a record high of 115°F and record low of 15°F was measured. These temperatures are used in determining the maximum possible emissions from the project and the maximum emission impacts in the air dispersion modeling analysis.

Winds in the area are strongly influenced by the Temblor Range to the west and the marine air that enters the Central Valley through the Carquinez Strait and Altamont Pass in the Bay Area to the north. During the summer, marine air entering the Central Valley results in northeasterly winds in the daytime hours. In the nighttime hours downslope drainage of air from the hills and mountains to the south and west results in winds from the southwest. This wind flow pattern is fairly consistent throughout the year, although there is more variability to wind directions during the winter with the passage of storms through the area. Winds are usually of higher speeds during the summer because during the winter, calm and stagnant atmospheric conditions can occur between storms and the influence of the marine air from the coast is significantly diminished.

Along with the winds, another climatic factor affecting emission impacts is atmospheric stability and mixing height. Atmospheric stability is an indicator of the air turbulence and mixing. During the daylight hours of the summer when the earth is heated and air rises, there is more turbulence, more mixing and thus less stability. During these conditions there is more air pollutant dispersion and therefore usually fewer air quality impacts from a single air pollution source like the PEF. During the winter months between storms, very stable atmospheric conditions occur, resulting in very little mixing. Under these conditions, little air pollutant dispersion occurs, and consequently higher air quality impacts result from stationary source emissions. Mixing heights are generally lower during the winter, along with lower mean wind speeds and less vertical mixing.

EXISTING AIR QUALITY

The Federal Clean Air Act and the California Air Resources Board (CARB) both require the establishment of allowable maximum ambient concentrations of air pollutants, called ambient air quality standards (AAQS). The state AAQS, established by CARB, are typically lower (more protective) than the federal AAQS, which are established by the EPA. The state and federal air quality standards are listed in AIR QUALITY Table 1. As indicated in AIR QUALITY Table 1, the averaging times for the various air quality standards (the duration over which they are measured) range from one-hour to one year. The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per a volume of air, in milligrams or micrograms of pollutant in a cubic meter of air (mg/m^3 and $\mu g/m^3$).

In July 1997, the EPA promulgated new ozone and PM2.5 (particulate matter less than 2.5 microns in diameter) ambient air quality standards, which are shown in AIR QUALITY Table 1. The new 8-hour ozone standard was intended to replace the existing 1-hour standard. The PM2.5 standard was intended to supplement the existing PM10 standards. Although the standards may be set, the EPA will first have to designate areas which violate these new standards, and then air districts that violate these standards will have to prepare implementation plans to reach attainment of those standards. Additionally, these standards have been set aside by a federal court deciion

In general, an area is designated as attainment for a specific pollutant if the concentrations of that air contaminant do not exceed the standard. Likewise, an area is designated as non-attainment for an air contaminant if that standard is violated. Where not enough ambient data are available to support designation as either attainment or non-attainment, the area can be designated as unclassified. Unclassified areas are normally treated the same as attainment areas for regulatory purposes. An area can be attainment for one air contaminant while non-attainment for another, or attainment for the federal standard and non-attainment for the state standard for the same contaminant. The entire area within the boundaries of a district is usually evaluated to determine the district's attainment status.

The PEF is located in the Kern County portion of the San Joaquin Valley Air Basin and, as stated above, is under the jurisdiction of the San Joaquin Valley Unified Air Pollution Control District. This area is designated as non-attainment for both the state and the federal ozone and PM10 standards, attainment for the state's CO, NO_2, SO_2, SO_4 and Lead standards, attainment for the federal SO_2 standard, and unclassified/attainment for the federal CO and NO_2 standards (ARB 1998).

Ambient air quality data collected between 1988 and 1998 at the different monitoring stations close to the project's site is presented in AIR QUALITY Tables 3, 4, and 5. That data shows there have been no violations during that period of the CO, NO_2, or SO_2 ambient air quality standards.

AIR QUALITY Table 1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O3)	1 Hour	0.12 ppm (235 $\mu g/m^3$)	0.09 ppm (180 $\mu g/m^3$)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 $\mu g/m^3$)	---
	1 Hour	---	0.25 ppm (470 $\mu g/m^3$)
Sulfur Dioxide (SO_2)	Annual Average	80 $\mu g/m^3$ (0.03 ppm)	---
	24 Hour	365 $\mu g/m^3$ (0.14 ppm)	0.04 ppm (105 $\mu g/m^3$)
	3 Hour	1300 $\mu g/m^3$ (0.5 ppm)	---
	1 Hour	---	0.25 ppm (655 $\mu g/m^3$)
Respirable Particulate Matter (PM10)	Annual Geometric Mean	---	30 $\mu g/m^3$
	24 Hour	150 $\mu g/m^3$	50 $\mu g/m^3$
	Annual Arithmetic Mean	50 $\mu g/m^3$	---
Fine Particulate Matter (PM2.5)	24 Hour	65 $\mu g/m^3$	---
	Annual Arithmetic Mean	15 $\mu g/m^3$	---
Sulfates (SO_4)	24 Hour	---	25 $\mu g/m^3$
Lead	30 Day Average	---	1.5 $\mu g/m^3$
	Calendar Quarter	1.5 $\mu g/m^3$	---
Hydrogen Sulfide (H_2S)	1 Hour	---	0.03 ppm (42$\mu g/m^3$)
Vinyl Chloride (chloroethene)	24 Hour	---	0.010 ppm (26 $\mu g/m^3$)
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.

OZONE

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants. Nitrogen oxides (NOx) and hydrocarbons (Volatile Organic Compounds [VOCs]) interact in the presence of sunlight to form ozone. The collected air quality data, summarized in AIR QUALITY Table 2, indicate that the ozone violations occurred primarily during the period of March through October.

In the most recent ARB report on the contribution of various districts to ozone violations in other districts (ARB 1996), ARB concluded that the San Joaquin Valley Air Basin contributes measurably to ambient ozone levels in other districts, and that other districts contribute measurably to the San Joaquin Valley's ozone problems. The report concludes that sources within the San Joaquin Valley Air Basin

contribute to ozone levels in Mountain County districts to the northeast, the South Central Air Basin to the south, to the Mojave Desert to the east, the Sacramento area to the north, the Great Basin Valleys to the east, and to the North Central Coast Air Basin to the west. Conversely, emissions from districts such as the Bay Area Air Quality Management District and the Sacramento Air Quality Management District contribute to San Joaquin Valley's ozone problems. This widespread contribution from one geographic area to another demonstrates the regional nature of the ozone problem and ozone formation.

AMBIENT PM10

As AIR QUALITY Table 6 indicates, the project area also annually experiences a number of violations of the state 24-hour PM10 standard, although violations of the federal 24-hour standard are occurring occasionally. The violations of the state 24-hour standard occur through out the year, with the highest number of violations occurring from September through December.

PM10 can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NOx, SO_x and VOC from turbines, and ammonia from NO_x control equipment can, given the right meteorological conditions, form particulate matter known as nitrates (NO3), sulfates (SO4), and organics. These pollutants are known as secondary particulates, because they are not directly emitted but are formed through complex chemical reactions in the atmosphere. NO_x emissions contribute significantly to the formation of particulate nitrate in the region and ammonia nitrate is the largest contributor to PM10 levels during the winter when ambient PM10 levels are at their highest.

PEF ESTIMATED EMISSIONS

CONSTRUCTION PHASE

The construction phase includes the power plant and ancillary facilities (i.e., transmission lines, and pipelines for reclaimed water, natural gas, and water). The construction of the roposed power plant will result in temporary emissions for approximately 24 months. All construction scheduling is based on a 40-hour per week. The activities during the main phase of construction will include site preparation including cleaning, grading and excavation for the foundation. After the site preparation is completed, the construction of the foundations will follow. Installations and assembly of mechanical equipment will begin soon after the foundation work is completed.
Fugitive dust will be emitted primarily during the site preparation, grading and excavation, travelling on the unpaved surfaces and during the loading and unloading of soil from/to the site. Criteria pollutants also will be emitted during the construction of project from combustion emissions. These emissions are primarily exhaust from the diesel construction equipment used in all phases of the site

AIR QUALITY Table 2
Ozone Air Quality Summary, 1988-1998

Maximum 1-hour measured concentration (parts per million - ppm)

Yr.	Maricopa-Stanislaus Street			Edison			Arvine-Bear Mountain Blvd			Bakersfield California Ave			Oildale-3311 Manor Street		
	Max. 1-hr Avg. (ppm)	Days Above State Stand.	Month Violations occurred	Max. 1-hr Avg. (ppm)	Days Above State Stand.	Month Violations occurred	Max. 1-hr Avg. (ppm)	Days Above State Stand.	Month Violations occurred	Max. 1-hr Avg. (ppm)	Days Above State Stand.	Month Violations occurred	Max. 1-hr Avg. (ppm)	Days Above State Stand.	Month Violations occurred
1988	0.14	69	F, Ap, My, Ju, Jl, Au, S, O	0.17	125	F, M, Ap, My, Ju, Jl, Au, S, O N	NA	NA	NA	NA	NA	NA	0.14	73	F, M, Ap, My, Ju, Jl, Au, S, O
1989	0.13	52	Ap, My, Ju, Jl, Au, S, O , N	0.16	102	Ap, My, Ju, Jl, Au, S, O, N	0.18	101	Ju, Jl, Au, S, O N	NA	NA	NA	0.13	34	Ap, My, Ju, Jl, Au, S, O, N
1990	0.12	23	Ap, Ju, Jl, Au, S, O	0.15	90	M, Ap, My, Ju, Jl, Au, S, O, N	0.17	100	M, Ap, My, Ju, Jl, Au, S, O, N	NA	NA	NA	0.14	28	Ju, Jl, Jl, Au, S, O
1991	0.12	38	Ju, Jl, Au, S, O, N	0.16	93	Ap, My, Ju, Jl, Au, S, O, N	0.16	118	Ap, My, Ju, Jl, Au, S, O, N	NA	NA	NA	0.13	45	Ju, Jl, Au, S, O, N
1992	0.11	25	My, Ju, Au, S, O, N	0.14	33	Ap, My, Ju, Jl, Au, S, O	0.15	94	Ap, My, Ju, Jl, Au, S, O	NA	NA	NA	0.12	25	Ap, My, Ju, Jl, Au, S, O
1993	0.12	17	Ju, Jl, Au, S	0.16	95	M, Ap, My, Ju, Jl, Au, S, O	0.15	86	M, Ap, My, Ju, Jl, Au, S, O	NA	NA	NA	0.12	26	My, Ju, Jl, Au, S, O
1994	0.116	11	Ju, Jl, Au, S, O	0.175	104	Ap, My, Ju, Jl, Au, S, O	0.147	87	Ap, My, Ju, Jl, Au, S, O	0.123	27	Ju, Jl, Au, S	0.117	21	My, Ju, Jl, Au, S,
1995	0.125	57	Ju, Jl, Au, S, O, N	0.168	103	Ap, My, Ju, Jl, Au, S, O	0.150	87	My, Ju, Jl, Au, S, O	0.134	59	My, Ju, Jl, Au, S, O	0.125	33	Ju, Jl, Au, S, O
1996	0.121	63	My, My, Ju, Jl, Au, S, O	0.165	90	Ap, My, Ju, Jl, Au, S, O	0.164	112	M, Ap, My, Ju, Jl, Au, S, O	0.132	66	My, Ju, Jl, Au, S, O	0.127	45	Ap, My, Ju, Jl, Au, S, O
1997	0.116	24	M, My, My, Ju, Jl, Au, S, O	0.146	50	M, My, Ju, Jl, Au, S, O	0.134	57	My, , Ju, Jl, Au, S, O	0.12	14	Ju, Jl, Au, S, O	0.114	5	Jl, Jl, Au, S, O
1998	0.143	62	Ju, Jl, Au, S, O	0.165	71	Ju, Jl, Au, S	0.151	71	Ju, Jl, Au, S	0.124	29	Ap, Ju, Jl, Au	0.122	37	My, Jl, Au, S, O

California Ambient Air Quality Standard: 0.09ppm (1-hour average)
National Ambient Air Quality Standard: 0.12ppm (1-hour average)
Month abbreviations: J-January, F-February, M-March, Ap-April, My-May, Ju-June, Jl-July, Au-August, S-September, O-October, N-November, D-December
NA: Data are Not Available.
Source: CARB. 1991-1998 “Air Quality CD-ROM”

AIR QUALITY Table 3

CO AIR QUALITY SUMMARY, 1988-1998

Maximum 1-hour measured concentration (parts per million - ppm)

Yr.	EDISON			BAKERSFIELD-CHESTER STREET			BAKERSFIELD-GOLDEN HIGHWAY			BAKERSFIELD CALIFORNIA AVE			OILDALE-3311 MANOR STREET		
	Max. 1-hr Avg. (ppm)	Days Above State Stand.	Month Violations occurred	Max. 1-hr Avg. (ppm)	Days Above State Stand.	Month Violations occurred	Max. 1-hr Avg. (ppm)	Days Above State Stand.	Month Violations occurred	Max. 1-hr Avg. (ppm)	Days Above State Stand.	Month Violations occurred	Max. 1-hr Avg. (ppm)	Days Above State Stand.	Month Violations occurred
1988	1	0	NA	12	0	NA	NA	NA	NA	NA	NA	NA	4	0	NA
1989	3	0	NA	14	0	NA	NA	NA	NA	NA	NA	NA	6	0	NA
1990	3	0	NA	13	0	NA	NA	NA	NA	NA	NA	NA	5	0	NA
1991	4	0	NA	13	0	NA	NA	NA	NA	NA	NA	NA	4	0	NA
1992	7	0	NA	11	0	NA	NA	NA	NA	NA	NA	NA	4	0	NA
1993	2	0	NA	8	0	NA	NA	NA	NA	NA	NA	NA	3	0	NA
1994	1.5	0	NA	8.8	0	NA	7.9	0	NA	6.3	0	NA	2.1	0	NA
1995	NA	NA	NA	NA	NA	NA	7.4	0	NA	7.8	0	NA	NA	NA	NA
1996	NA	NA	NA	NA	NA	NA	6.2	0	NA	8.7	0	NA	NA	NA	NA
1997	NA	NA	NA	NA	NA	NA	6.1	0	NA	5.2	0	NA	NA	NA	NA
1998	NA	NA	NA	NA	NA	NA	5.2	0	NA	5.7	0	NA	NA	NA	NA

California Ambient Air Quality Standard: 20 ppm (1-hour average)
National Ambient Air Quality Standard: 35 ppm (1-hour average)
Month abbreviations: J-January, F-February, M-March, Ap-April, My-May, Ju-June, Jl-July, Au-August, S-September, O-October, N-November, D-December
NA: Data are Not Available.
Source: CARB. 1991-1998 “Air Quality CD-ROM”

AIR QUALITY Table 4
NO_2 Air Quality Summary, 1988-1998
Maximum 1-hour measured concentration (parts per million - ppm)

Yr.	Edison			Arvine-Bear Mountain Blvd			Bakersfield California Ave			Oildale-3311 Manor Street		
	Max. 1-hr Avg. (ppm)	Days above state standard	Month Violation occurred	Max. 1-hr Avg. (ppm)	Days above state standard	Month Violation occurred	Max. 1-hr Avg. (ppm)	Days above state standard	Month Violation occurred	Max. 1-hr Avg. (ppm)	Days above state standard	Month Violation occurred
1988	0.06	0	NA	NA	NA	NA	NA	NA	NA	0.11	0	NA
1989	0.11	0	NA	0.05	0	NA	NA	NA	NA	0.11	0	NA
1990	0.09	0	NA	0.07	0	NA	NA	NA	NA	0.12	0	NA
1991	0.09	0	NA	0.06	0	NA	NA	NA	NA	0.08	0	NA
1992	0.08	0	NA	0.09	0	NA	NA	NA	NA	0.07	0	NA
1993	0.07	0	NA	0.07	0	NA	NA	NA	NA	0.07	0	NA
1994	0.085	0	NA	0.076	0	NA	0.089	0	NA	0.073	0	NA
1995	0.063	0	NA	0.05	0	NA	0.109	0	NA	0.08	0	NA
1996	0.076	0	NA	0.06	0	NA	0.099	0	NA	0.065	0	NA
1997	0.065	0	NA	0.065	0	NA	0.081	0	NA	0.059	0	NA
1998	0.06	0	NA	0.051	0	NA	0.084	0	NA	0.08	0	NA

California Ambient Air Quality Standard: 0.25 ppm (1-hour average)
Month abbreviations: J-January, F-February, M-March, Ap-April, My-May, Ju-June, Jl-July, Au-August, S-September, O-October, N-November, D-December
NA: Data are Not Available.
Source: CARB. 1991-1998 “Air Quality CD-ROM”

AIR QUALITY Table 5
SO_2 Air Quality Summary, 1988-1998
Maximum 1-hour measured concentration (parts per million - ppm)

Yr.	BAKERSFIELD-CHESTER STREET			Bakersfield California Ave			Oildale-3311 Manor Street		
	Max. 1-hr Avg. (ppm)	Days above state standard	Month Violations occurred	Max. 1-hr Avg. (ppm)	Days above state standard	Month Violations occurred	Max. 1-hr Avg. (ppm)	Days above state standard	Month Violations occurred
1988	0.04	0	NA	NA	NA	NA	0.07	0	NA
1989	0.06	0	NA	NA	NA	NA	0.04	0	NA
1990	0.04	0	NA	NA	NA	NA	0.14	0	NA
1991	0.03	0	NA	NA	NA	NA	0.02	0	NA
1992	0.03	0	NA	NA	NA	NA	0.02	0	NA
1993	0.03	0	NA	NA	NA	NA	0.03	0	NA
1994	0.013	0	NA	0.02	0	NA	0.029	0	NA
1995	NA	NA	NA	0.026	0	NA	0.022	0	NA
1996	NA	NA	NA	0.059	0	NA	0.018	0	NA
1997	NA	NA	NA	0.011	0	NA	0.022	0	NA
1998	NA	NA	NA	NA	NA	NA	NA	0	NA

California Ambient Air Quality Standard: 0.25 ppm (1-hour average)
Month abbreviations: J-January, F-February, M-March, Ap-April, My-May, Ju-June, Jl-July, Au-August, S-September, O-October, N-November, D-December
NA: Data are Not Available.
Source: CARB. 1991-1998 “Air Quality CD-ROM”

Air Quality Table 6
Particulate Matter –10 micro (PM 10) Summary 1988-1998
Concentration (micrograms per cubic meter - $\mu g/m^3$)

Yr.	Taft College			Bakersfield-Golden State Highway			Bakersfield California Ave			Oildale-3311 Manor Street		
	Max. 24-hr Avg. $\mu g/m^3$	Days above state stand.	Month Violations occurred	Max. 24-hr Avg. $\mu g/m^3$	Days above state stand.	Month Violations occurred	Max. 24-hr Avg. $\mu g/m^3$	Days above state stand.	Month Violations occurred	Max. 24-hr Avg. $\mu g/m^3$	Days above state stand.	Month Violations occurred
1988	NA	NA	NA	NA	NA	NA	NA	NA	NA	216	37	J, F, M, Ju, Jl, Au, S, O, N, D
1989	NA	NA	NA	NA	NA	NA	NA	NA	NA	191	38	J, F, M, Ap, Ju, Jl, Au, S, O, N, D
1990	158	15	Au, S, O, N, D	NA	NA	NA	NA	NA	NA	251	37	J, F, My, Ju, Jl, Au, S, O, N,D
1991	170	26	J, F, M, Ap, My, Ju, S, O, N, D	NA	NA	NA	NA	NA	NA	189	37	J, F, M, Ap, My, Ju, Jl, Au, S, O, N, D
1992	110	15	J, F, Ap, My, Ju, Au, S,O, N	NA	NA	NA	NA	NA	NA	153	29	J, F, M, My, Ju, Jl, Au, S, O, N, D
1993	118	13	J, S, O, N, D	NA	NA	NA	NA	NA	NA	96	24	J, M, My, Ju, Jl, Au, S, O, N, D
1994	64	6	J, Au, O, N	102	19	Jl, Au, S, O, N, D	97	16	Jl, Au, S, O, N, D	133	18	J, M, Jl, Au, S, O, N, D
1995	93	15	F, Au, S, O, N, D	132	31	F, M, Ju,Jl, Au, S, O, N, D	130	36	J, F, Ju, Au, S, O, N, D	195	22	J, F, M, Ju, Au, S, O, N, D
1996	94	12	F, Ap, Au, S, O, N	103	34	J, F, M, Ap, My, Ju, Jl, Au, S, O, N,	153	23	J, F, M, Au, S, O, N, D	138	12	F, Ap, J, Au, S, O, N
1997	78	6	J, F, M, Au, O, D	124	14	J, F, M, My, Jl, Au, S, O, N,	137	25	J, F, M, My, Jl, Au, O, N, D	125	9	J, F, M, My, Jl, Au, O, N
1998	84	6	Ap, Au, S, O, D	159	19	Jl, Au, S, O, N, D	148	27	J, M, Ap, Jl, Au, S, O, N, D	103	17	J, Ju, Au, S, O, N, D

California Ambient Air Quality Standard: 50 $\mu g/m^3$ (24-hour average)
National Ambient Air Quality Standard: 150 $\mu g/m^3$ (24-hour average)
Month abbreviations: J-January, F-February, M-March, Ap-April, My-May, Ju-June, Jl-July, Au-August, S-September, O-October, N-November, D-December
NA: Data are Not Available.
Source: CARB. 1991-1998 “Air Quality CD-ROM”

preparation, exhaust from water trucks, welding equipment, workers vehicles, delivery trucks, generators and compressors.

Appendix I-5 in the AFC presents detailed construction emission estimates for fugitive dust, PM10, NO_x, CO, SO_x, and VOC emissions from vehicles. It is important to understand that construction estimated emissions are highly unavoidable and speculative since detailed activity data can not be forecast accurately and the emission factors used in these estimations are known to be worst case estimates.

COMMISSIONING AND OPERATIONAL PHASES

"Commissioning" is the technical term used to describe, in general, all the initial operations of the power plant once it has been physically installed but is not yet in commercial operation. Commissioning starts with the first firing of fuel in the GT/HRSG. During commissioning the control systems are tested, the inside and outside of tubes are cleaned up, and the control systems are installed after determining that there are no contaminants in the GT/HRSG that may damage the surfaces of the catalysts. It is important to emphasize that during the commissioning period, which can last for several months, the power plant will operate without emission controls. Commissioning ends with the start of commercial operation, which is usually signaled by the issuance of the Permit to Operate (PTO) from the local air district.

The proposed PEF will provide 750 MW of electricity. It includes three combined cycle power trains. Each power train consists of a General Electric (GE) frame 7 F class combustion turbine generator rated at 168 MW, and a heat recovery steam generator (GT/HRSG). The steam from the heat recovery steam generators will be fed to two steam turbines rated at 185 MW and 90 MW. One emergency diesel engine 425 hp will be used to drive the firewater pump and a 814 hp natural gas engine will be used to provide electrical power in the event that of a transmission line outage. The facility will also include 24-cells mechanical cooling tower which will operate a 8760 hours/year. AIR QUALITY Table 7 summarizes the hourly, daily and annual air emissions associated with the operation of the PEF.

The PEF will burn only natural gas, with no provisions for an alternative backup fuel. The exclusive use of natural gas, an inherently clean fuel, compared to oil or coal, will limit the formation of VOC, PM10, and SO_x emissions. The combustion turbines will be equipped with dry low-NOx combustors and XONON technology to minimize NO_x formation. Depending on the development of the XONON technology, selective catalytic reduction (SCR) and ammonia injection may be used to achieve the desire level of NOx control. Continuous emissions monitoring system (CEMs) will be required and installed to closely monitor the project's emission levels. The PEF will utilize a post-combustion oxidizing catalyst to further control CO and VOC emissions.

AIR QUALITY Table 7
Maximum Hourly, Daily, and Annual Emissions

	NO_x	CO	VOC	PM10	SO_x
GT1 (lb/hr)	17.03	24.92	3.8	18.47	3.5
GT2 (lb/hr)	17.03	24.92	3.8	18.47	3.5
GT3 (lb/hr)	17.03	24.92	3.8	18.47	3.5
Cooling Tower (lb/hr)	-	-	-	1.1	-
EG (lb/hr)	1.84	3.62	0.23	0.012	0.014
FPE (lb/hr)	5.34	0.63	0.05	0.106	0.14
Total Facility Daily Emissions (lb/day)					
	1837.7	6339	1258.3	1355	252
Total Facility Annual Emissions (Ton/year)					
	206	610	122	228	42.3

GT1 = the first gas turbine.
GT2 = the first gas turbine.
GT3 = the first gas turbine.
EG = Emergency Generator, limited to 200 hours per year.
FPE = Fire Pump Engine, limited to 200 hours per year.
Daily emissions assume 3.6 hours of cold start-up, 0.5 hour of shutdown and 19.9 hours of operation.

Source: Air Quality section 5.2 of the AFC.

FACILITY CLOSURE

Eventually the PEF will close, either because 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 no longer occur.

A Permit to Operate, issued by the District under Rule 2010, is required for operation of the facility once it is constructed, and is usually renewed on a five year schedule. However, during those five years, the PEF must still pay permit fees annually. If the PEF chooses to close the facility and not pay the permit fees, then the Permit to Operate would be cancelled. In that event, the project could not restart and operate unless the fees are paid to renew the Permit to Operate.

If PEF were to decide to dismantle the project, there would likely be fugitive dust emissions associated with this dismantling effort. District Rule 8020 requires that during demolition fugitive dust emissions be limited to no greater than 40% opacity by means of water application or chemical suppressants. The Facility Closure Plan, to be submitted to the Energy Commission Compliance Project Manager, should include the specific details regarding how the project plans to demonstrate compliance with the District Rule 8020 in the event of a closure.

PROJECT INCREMENTAL IMPACTS

The air quality impacts assessment of project construction and operation are shown in the following sections. Staff has reviewed the modeling protocol and the analysis of the worst case scenario during construction and operation and find it acceptable.

MODELING APPROACH

The Applicant used the SCREEN model to select the worst case turbine configuration that would produce the highest emission impacts. The SCREEN model, which is approved by EPA, is designed to provide conservative estimates of emission impacts. Based on the results of the SCREEN model, the Applicant modeled the three GE frame 7F gas turbines and HRSGs configuration, using a more refined modeling analysis. This more refined modeling analysis was done with the EPA approved Industrial Source Complex (ISC) model, and used near-by meteorological data collected at the Bakersfield – California Avenue.

CONSTRUCTION IMPACTS

The Applicant estimated the impacts of construction-related emissions using the ISC model. AIR QUALITY Table 8 provides a summary of the maximum estimated impacts. The modeling results indicate that the construction-related emissions under worst conditions would cause violations of the one hour NO_2 standard and 24 hour and annual PM10 standards. It is also important to note that these are temporary impacts that would only occur during the construction phase of the project, and they reflect the implementation of some construction related mitigation measures which will be included in the conditions of certification proposed by Energy Commission staff to minimize emissions

As AIR QUALITY Table 8 shows that the construction activities would cause a violation of the state 1-hour and annual average NO2 standards and further exacerbate existing violations of the state 24-hour and annual average PM10 standards. In reviewing the modeling output files, the project's construction impacts are not occasional or isolated events, but are over an area within a few hundred meters of the project site. These predicted impacts are of such a high magnitude for a number of reasons.

AIR QUALITY Table 8
Maximum Estimated Construction-Related Incremental Impacts

Pollutant	Averaging Time	Incremental Impacts ($\mu g/m^3$)	Maximum Background ($\mu g/m^3$)[1]	Maximum Total Impacts ($\mu g/m^3$)	State Limiting Standard ($\mu g/m^3$)	Federal Limiting Standard ($\mu g/m^3$)	Percent of the Standard (%)
NO_2	1-hour	6010	207		470		
	Annual	63	55		-	100	
PM10	24-hour	94.8	153		50	150	
	Annual	15.27	23		30	-	
CO	1-hour	3229	10307		23000	40000	
	8-hour	1437	8818		10000	10000	

[1] Based on maximum daily emissions during month 15 of construction period.
Source: Data responces March 3, 2000.

First, some of the sources of combustion emissions (the bulldozers and trucks) are mobile sources, not stationary sources as input into the model. Therefore, as mobile sources, the air quality impacts would not always be at the same locations, so the model results are overstated. Second, it was assumed that all the equipment identified for the modeling evaluation would be running simultaneously. It is

doubtful that all the major equipment would all be operating at one time, and thus the impacts are overstated.

Finally, the emissions inputs to the model were from the highest monthly emissions assumed during the 24 months construction period. The levels of emissions used reflect a period of activity of approximately one year, not the entire 24 months construction. During the other months of construction work, considerably less emissions generating equipment will be used and thus the impacts will be lower.

PROJECT NORMAL OPERATIONAL IMPACTS

The Applicant has assessed the impact of the operation of the facility using EPA-approved air quality dispersion models and guidelines without considering the offsets that will be provided. Staff finds the Applicant's analysis of the operational impact to be acceptable. The AFC presents the SCREEN and the ISC modeling analyses in the data responses dated March 13, 2000, and the AFC. The impact analyses were used to determine the worst case ground level impacts of the facility. The results show that the facility, by itself, does not violate the State or Federal ambient air quality standards for all pollutants. However, the PM10 impact from the facility, when added to the existing background levels, which are already above the State Standard, will further violate the 24 hour State Standard. The applicant will mitigate the project's PM10 impact by providing emission offsets as discussed in the mitigation section below. AIR QUALITY Table 9 presents a summary of the ISC modeling results for the proposed PEF.

AIR QUALITY Table 9
ISC Modeling Results

Pollutant	Averaging Time	Facility Maximum Impact ($\mu g/m^3$)	Maximum Background ($\mu g/m^3$)	Maximum Total Impacts ($\mu g/m^3$)	State Limiting Standard ($\mu g/m^3$)	Federal Limiting Standard ($\mu g/m^3$)	Percent of Standard (%)
NO_2	1-hour	35.7	207	210.7	470		44.8
	Annual	0.3	55	55.3	-	100	55.3
CO	1-hour	309.9	10307	10617	23000	40000	46
	8-hour	40	8818	8858	10000	10000	88.58
PM10	24-hour	2.56	153	155.56	50	150	311
	Annual	0.42	23	23.42	30	-	78
SO_2	1-hour	2.43	157	159.43	650	-	24.5
	24-hour	0.51	29	29.51	109	365	27
	Annual	0.09	5	5.09	-	80	6.3

Source: Data responces March 3, 2000.

CUMULATIVE IMPACTS

The Energy Commission staff provided the Applicant with a modeling protocol to conduct the cumulative impact analysis. The major component of the protocol required the Applicant to include in the modeling all known future projects within six miles of the SEF. Then, the modeling results (impacts) would be added to the ambient background levels to establish the total impact. The District conducted a comprehensive review and determined that there are no planned facilities within the

six miles that are eligible for modeling. Therefore, there is no cumulative impact from this project.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

The Applicant is proposing to mitigate the project's potential air quality impacts using a state of the art combustion technology, installing post-combustion control devices, and providing offsets, as required by the San Joaquin Valley Air Pollution Control District's regulations. The Applicant is proposing to install a gas turbine equipped with XONON technology that can achieve low NO_x concentrations. Furthermore, the Applicant is proposing to install a CO catalyst to reduce CO emissions.

ADEQUACY OF PROPOSED MITIGATION

BACT is the levels applicable to individual projects that are typically determined by the local air district with input from the Air Resources Board (ARB) and EPA. Recently, the EPA issued a letter to all air quality districts dated March 24, 2000, in which EPA has clearly stated their position regarding what they consider to be BACT and Lowest Achievable Emission Rates (LAER). EPA believes that BACT/LAER analyses for combined cycle gas turbine power plant projects must include consideration of technologies like SCONOX and XONON to achieve lower NOx and CO limits without the use of ammonia or oxidation catalyst.

CONTROL OF NOX EMISSIONS

The project's NO_x emissions consist primarily of nitric oxide (NO) and a small percentage of nitrogen dioxide (NO_2). Thermal NO_x is the product of the oxidation of N_2 (present in the air used for combustion) at the temperatures present in the combustion process. Some NO_x is formed from the oxidation of nitrogen present in the fuel. Nitrogen is not present in significant quantities in natural gas, so most of the NO_x emissions from this project are due to thermal NO_x.

Combustion chamber NO_x can be controlled by reducing the flame temperature in the combustion chamber through quenching steam and dilution using water and steam injection. Additionally, thermal NO_x can be controlled with combustor designs that premix the air and fuel and stage the combustion process (a reducing atmosphere followed by an oxidizing atmosphere). NO_x emissions from the PEF will be controlled through the use of dry low NO_x combustors in the CTGs and the use of XONON technology.

The XONON system, which is developed by Catalytica, is a new way to carry out combustion that prevents the formation of NOx while achieving low CO and hydrocarbon levels. The system is totally contained within the combustor of the gas turbine. The XONON technology consists of four sections: a) the preburner for start-up and acceleration of the engine; b) the fuel injection and fuel/air mixing system which provide a uniform fuel-air mixture to the catalyst; c) the XONON

catalyst module where a portion of the fuel is combusted without a flame to produce a high temperature gas; d) the homogeneous combustion region located downstream of the catalyst module where the remainder of the fuel is combusted, and CO and hydrocarbon are reduced to a very low levels. The process is also a flameless combustion process. No ammonia is required in this process.

In addition, the Applicant is proposing, as an alternative to the XONON technology, the use of the SCR system will control NO_x emission levels to 2.5 ppm corrected @ 15 percent O_2. SCR is a process that chemically reduces NO_x by injecting ammonia (NH_3) over a catalyst in the presence of oxygen (O_2). The process is termed selective because the NH_3 reducing agent preferentially reacts with NO_x rather than O_2 to form N_2 in the presence of excess O_2 at temperatures in the range of 400 to 750 ^oF. If the temperature is lower than 400^oF, the ammonia reaction rate is low, and, therefore, NH_3 emissions (called ammonia slip) will increase.

CONTROL OF CARBON MONOXIDE (CO) AND VOLATILE ORGANIC COMPOUNDS (VOC)

Good operating and maintenance practices are the only measures proposed for this project to limit the project's CO and reduce VOC emissions. Combustion turbines inherently generate low CO and VOC emissions when burning natural gas. However, while high combustion temperatures, fuel/air mixing, and the excess air inherent in the CTG's combustion process favor complete combustion of fossil fuels, these conditions, also lead to higher NO_x emissions. Current CTG designs attempt to balance achieving low NO_x emissions (from the CTG prior to post-combustion controls) while keeping CO and VOC emissions low. The Applicant is proposing to install an oxidation catalyst on the Pastoiria Energy Facility to control CO emissions and VOC emissions.

CONTROL OF PM10

Natural gas fuel contains only trace quantities of noncombustible material. Particulate emissions (PM_{10}) will be controlled by inlet air filtering for the combined cycle CTG and HRSG unit. In addition, the Applicant proposes to use a cooling tower which includes 0.0005% drift eliminator efficiency to reduce PM10 emissions associated with its operation. This is the best control technology available for this purpose.

SULFUR DIOXIDE EMISSIONS CONTROL

The PEF's SO_2 emissions will be controlled by burning only natural gas, which typically contains only traces of sulfur. The emissions from the project's CTGs are expected to be very small without the use of any additional post-combustion SO_2 control equipment, since natural gas contains only 0.75 grain of sulfur/100 scf.

EMISSION OFFSETS

Emission reduction credits (ERCs) can be created when existing permitted emission sources cease operation or reduce their operation below permitted levels. The ERCs are reviewed and approved by the local air district and recorded in their "bank" for future use. To fully mitigate the facility's potential emission increases, the

Applicant plans to purchase emission reduction credits (ERCs) from the District's ERC bank.

Offsets, in the form of ERCs, are required for the PEF for NO_x, PM10, SOx and VOC in order to assure the project will not interfere with the District's future attainment plans.

In past siting cases some intervenors have argued that the ERCs are not actual mitigation since the emission reductions have already occurred and, therefore, ambient air quality can only deteriorate with the new source of emissions. However, the District, in its Air Quality Management Plan (AQMP), includes banked ERCs in its planning emissions inventories for future years as actual ongoing emissions. Therefore, the future effects of new sources due to emission increases are already taken into account in the AQMP, including the use of ERCs as a source of mitigation or offsets. The new source will not detract from the District's attainment strategy. Consequently, we believe that banked offsets in this case constitute real mitigation of potential impacts from the proposed project in the context of the District's overall attainment strategy.

District Rule 2102, Section 4.2, requires that PEF provide emission offsets, in the form of banked Emission Reduction Credits (ERC), for the project's emissions increases of NO_x, SO_2, VOC and PM10. Offsets for the project's CO emissions are not required since the project will not cause any violations of any CO standard and the area currently does not experience any violations of any CO standard. The Applicant is proposing the following ERC's, which interpollutant trading strategy is utilized, to mitigate the project's emissions. A copy of the proposed ERC's is summarized in Appendix A. EPA has some concerns about these ERCs at this time. Staff will research these concerns and address them in the Final Staff Assessment.

COMPLIANCE WITH LORS

FEDERAL

The PEF is currently under review by EPA on the Prevention of Significant Deterioration (PSD) permit. EPA is in the process to issue a draft PSD analysis in the near future.

STATE

The project, with the anticipated full mitigation (offsets) that will be necessary for the project to secure a Determination of Compliance from the District, should comply with Section 41700 of the California State Health and Safety Code. Additional offsets may be required beyond that currently identified in the Determination of Compliance. Assuming the annual emission liability and offset issue is successfully resolved, the project would thus be fully mitigated and therefore would not cause any injury, detriment, nuisance or annoyance to the public.

LOCAL

The District has issued their Preliminary Determination Of Compliance (PDOC) on May 15, 2000. Based on a review of the PDOC, staff has determined that the project will comply with applicable District rules and regulations. Compliance with specific District's rules and regulations are discussed in details in the PDOC.

CONCLUSIONS AND RECOMMENDATIONS

Staff proposes the following recommendations:

- Because the PEF project's construction emissions impact is high, the staff suggests the following Conditions of Certification regarding project construction mitigation measures for preliminary consideration.
- Staff recommends that the ammonia slip of 10 ppm, as proposed in the AFC, should be reduced to 5 ppm for the following reasons: 1) California Air Resources Board guidelines issued in June 1999 recommended that ammonia slip should be limited to 5 ppm. Furthermore, California Air Resources Board required the implementation of their guidelines in their letter dated May 31, 2000, to the Bay Area Air Quality Management District; 2) further reduce the formation of ammonia nitrate and reduce the formation of secondary PM10; 3) to be consistent with EPA guidelines which are highlighted in their comment letter dated May 31, 2000, requiring 5 ppm ammonia slip on the Metcalf project; 4) different SCR manufacturers have provided guarantees to limit ammonia slip to 5 ppm without jeopardizing NOx emission BACT limits; 5) Monterey District required 5 ppm on Moss Landing because the District believed that this level is achievable.

The San Joaquin Valley Air Pollution Control District has submitted a preliminary Determination of Compliance (PDOC) dated May 15, 2000 (see Appendix B). The District has concluded that the PEF complies with all the District's rules and regulations. Comments on the PDOC from other agencies, USEPA and CARB, were submitted during the comment period.

The USEPA has expressed concerns and made suggestions for modifications to the PDOC (see also Appendix C). The USEPA:

- Requires the District to clarify its position on the NOx ERC's from source S-825-2 which was not included in the pre-1990 ERCs as current emissions in the attainment plan;
- Requires the District to ensure that pre-base-line SOx ERCs are included in the PM10 attainment plan and before allowing their use.
- Recommends to the District to limit summer quarter ozone precursors to the quantity of offsets provided during the summer and limit the winter PM10 emissions and its precursors to the amount of the quantity of offsets provided during the winter.
- Requires the district to limit the ammonia slip to 5 ppmv if the SCR chosen as an alternative to XONON.

- Recommends that CEMs should be used to monitor air emissions during start-ups and shut-downs. Also, recommends that the District requires (as a condition of certification) testing of the PM10 emissions during start-ups and shut-downs.

CARB also had concerns and suggested modifications to the PDOC (see also Appendix D). The CARB:

- Requires the district to limit the ammonia slip to 5 ppmv if the SCR chosen as an alternative to XONON.
- Requires the revision of conditions 17, 18 and 27. Please see the details in the CARB's letter.
- Recommends that the District assigns individual daily and annual emissions limits to each gas turbine instead of using combined emission limit.

CONDITIONS OF CERTIFICATION

AQ-1 Prior to the commencement of project construction, the project owner shall prepare a Construction Fugitive Dust Mitigation Plan that will specifically identify fugitive dust mitigation measures that will be employed for the construction of the PEF project and related facilities.

The Construction Fugitive Dust Mitigation Plan shall specifically identify measures to limit fugitive dust emissions from the following construction activities:

a) The Construction Fugitive Dust Mitigation Plan shall specifically identify measures to limit fugitive dust emissions from construction of the project site, the raw water pipeline, pump station and tank sites. Measures that should be addressed include:

- the identification of the employee parking area(s) and surface of the parking area(s);
- the frequency of watering of unpaved roads and disturbed areas;
- the application of chemical dust suppressants;
- the stabilization of storage isles and disturbed areas;
- the use of gravel in high traffic areas;
- the use of paved access aprons;
- the use of posted speed limit signs;
- the use of wheel washing areas prior to large trucks leaving the project site; and
- the methods that will be used to clean tracked-out mud and dirt from the project site onto public roads.

b) The following measures should be addressed for the transportation of the borrow fill material to the PEF site and the raw water pumping station.

use of covers on the vehicles, the wetting of the material and insuring appropriate freeboard of material in the vehicles.

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

AQ-2 The project owner shall ensure that the successful general contractor provide documentation to the project owner that demonstrates the contractor's heavy earthmoving equipment, that includes bulldozers, backhoes, compactors, loaders, motor graders and trenchers, and cranes, dump trucks and other heavy duty construction related trucks, have been properly maintained and the engines tuned to the engine manufacturer's specifications. During construction, the project owner shall compile maintenance records that continue to demonstrate that the equipment identified above are properly maintained and that the engines are tuned to the manufacturer's specifications.

Verification: The project owner shall submit to the CPM, via the Monthly Compliance Report, documentation, which demonstrates that the contractor's heavy earthmoving equipment is properly maintained and the engines are tuned to the manufacturer's specifications. The project owner shall maintain all records on the site for six months following the start of commercial operation.

AQ-3 The project owner shall ensure that all heavy earthmoving equipment including, but not limited to, bulldozers, backhoes, compactors, loaders, motor graders and trenchers, and cranes, dump trucks and other heavy duty construction related trucks, have been properly maintained and the engines tuned to the engine manufacturer's specifications. The project owner shall also install oxidizing soot filters on all suitable construction equipment used either on the power plant construction site or associated linear construction sites. Suitability is to be determined by an independent California Licensed Mechanical Engineer who will stamp and submit for approval an initial and all subsequent Suitability Reports as necessary containing at a minimum the following:

Initial Suitability Report:

- The initial suitability report shall be submitted to the CPM for approval 60 days prior to breaking ground on the project site.
- A list of all fuel burning, construction related equipment used,
- a determination of the suitability of each piece of equipment to work appropriately with an oxidizing soot filter,
- if a piece of equipment is determined to be suitable, a statement by the independent California Licensed Mechanical Engineer that the oxidizing soot filter has been installed and is functioning properly, and

- if a piece of equipment is determined to be unsuitable, an explanation by the independent California Licensed Mechanical Engineer as to the cause of this determination.
- Subsequent Suitability Reports:
- If a piece of construction related equipment is subsequently determined to be unsuitable for an oxidizing soot filter after such installation has occurred, the filter may be removed immediately. However notification must be sent to the CPM for approval containing an explanation for the change in suitability within 10 days.
- Changes in suitability are restricted to three explanations which must be identified in any subsequent suitability report.
- The oxidizing soot filter is reducing normal availability of the construction equipment due to increased downtime, and/or power output due to increased back pressure by 20% or more.
- The oxidizing soot filter is causing or reasonably expected to cause significant damage to the construction equipment engine.
- The oxidizing soot filter is causing or reasonably expected to cause a significant risk to nearby workers or the public.

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

APPENDIX A

Proposed Emission Reduction Credits
For
Pastoria Energy Facility

APPENDIX B

San Joaquin Valley Air Quality Management District
Preliminary Determination Of Compliance
For
Pastoria Energy Facility

APPENDIX C

United States Environmental Protection Agency
Comments Letter
On The Preliminary Determination Of Compliance
For

Pastoria Energy Facility

APPENDIX D

California Air Resources Board
Comments Letter
On The Prelimaniry Determination Of Compliance
For

Pastoria Energy Facility

REFERENCES

PEF (Pastoria Energy Facility) 1999a. Application for Certification, Volumes I and II, Pastoria Energy Facility Project (AFC-99-7). Submitted to the California Energy Commission on November 30, 1999.

PEF (Pastoria Energy Facility/Ray). 1999c. Air Quality and Health Risk Assessment Modeling Files (Electronic copies on CD-Rom.) Submitted to the California Energy Commission on November 30, 1999.

PEF (Pastoria Energy Facility/Heredia) 1999a. Prevention of Significant Deterioration (PSD) Application for the Proposed Pastoria Energy Facility Project. Submitted to the US Environmental Protection Agency on December 10, 1999. Submitted to the California Energy Commission on December 13, 1999.

PEF (Pastoria Energy Facility/Heredia) 1999b. Application for Determination of Compliance. Submitted to the San Joaquin Valley Unified APCD/Goff on December 7, 1999. Submitted to the California Energy Commission on December 13, 1999.

PEF (Pastoria Energy Facility/Hoffman) 1999a. Letter to US Enivromental Protection Agency/ Haber from Vicki Hoffman RE Regional Haze Analysis; dated December 22, 1999. Submitted to California Energy Commission on December 27, 1999.

PEF (Pastoria Energy Facility) 2000a. Response to CEC Data Adequacy Comments; dated December 29, 1999 (Supplement to AFC-99-7). Submitted to the California Energy Commission on January 5, 2000.

SJVUAPCD (San Joaquin Valley Unified Air Pollution Control District) 2000a. Letter to PEF/ Wehn from SJVUAPCD RE Notice of Complete Application; dated January 7, 2000. Submitted to the California Energy Commission on January 7, 2000.

SJVUAPCD 2000b. Letter to PEF/Heredia from San Joaquin Valley APCD RE Modeling Protocol; dated January 5, 2000. Submitted to the California Energy Commission on January 7, 2000.

PEF (Pastoria Energy Facility/Wehn) 2000a . Letter to CEC/Therkelsen RE Air Offsets and Transmission Studies for the Pastoria Energy Facility, and a Memorandum of Agreement between Chevron USA, Inc. and Pastoria Energy Facility, LLC. Submitted to the California Energy Commission on February 23, 2000.

PEF (Pastoria Energy Facility/Parquet) 2000a. Project Description Clarification for the Pastoria Energy Facility. Submitted to California Energy commission/Rhoads on March 1, 2000.

PEF (Pastoria Energy Facility/Thompson) 2000b. Errata Sheets for Section 5.2, Air Quality for the Pastoria Energy Facility. Submitted to the California Energy Commission on March 7, 2000.

PEF (Pastoria Energy Facility/Scholl) 2000b. Response to Staff Data Requests (Second Data Response Submittal). Submitted to the California Energy Commission on March 20, 2000.

USEPA (US Environmental Protection Agency/Haber) 2000a. Letter to all California air quality management districts RE update on the air pollution control technology. Submitted to the California Energy Commission on April 4, 2000.

PUBLIC HEALTH

Obed Odoemelam

INTRODUCTION

Operating the proposed Pastoria Energy Facility (PEF) would create combustion products and possibly expose the general public and workers to these pollutants as well as the toxic chemicals associated with other aspects of facility operations. The purpose of this public health analysis is to determine whether a significant health risk would result from public exposure to these chemicals and combustion by-products routinely emitted during project operations. The issue of possible worker exposure is addressed in the **Worker Safety and Fire Protection** section of this Preliminary Staff Assessment (PSA). Exposure to electric and magnetic fields (EMF) is addressed in the **Transmission Line Safety and Nuisance** section.

The primary concern in this section is exposure to pollutants for which no air quality standards have been established. These are known as noncriteria pollutants, toxic air pollutants, or air toxics. Those for which ambient air quality standards have been established are known as criteria pollutants. Since, as noted in the **Air Quality** section, this project is proposed for an area with existing violations of specific air quality standards, the potential for impact exacerbation is addressed in this **Public Health** section in assessing the need for specific mitigation.

The criteria pollutants are also identified in this section (along with regulations for their control) because of their usually significant contribution to the total pollutant exposure in any given area. Furthermore, the same control technologies may be effective for controlling both types of pollutants when emitted from the same source. Compliance with the required control technologies is discussed in the **Air Quality** section.

LAWS ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

The Clean Air Act of 1970 (42 U.S.C., section 7401 et seq.) required establishment of ambient air quality standards to protect the public from the effects of air pollutants. These standards have been established by the United States Environmental Protection Agency (EPA) for the major air pollutants: nitrogen dioxide, ozone, sulfur dioxide, carbon monoxide, sulfates, and particulate matter with a diameter of 10 micron or less (PM10), and lead.

STATE

California Health and Safety Code section 39606 requires the California Air Resources Board (ARB) to establish California's ambient air quality standards to reflect the California-specific conditions that influence its air quality. Such standards have been established by the ARB for ozone, carbon monoxide, sulfur dioxide, PM10,

lead, hydrogen sulfide, vinyl chloride and nitrogen dioxide. The same biological mechanisms underlie some of the health effects of most of these criteria pollutants as well as the noncriteria pollutants. The California standards are listed together with the corresponding federal standards in the **Air Quality** section.

California Health and Safety Code section 41700 states that "No person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause or have a natural tendency to cause injury or damage business or property."

The California Health and Safety Code section 39650 et seq. mandates that the California Environmental Protection Agency (Cal-EPA) establish safe exposure limits for toxic, noncriteria air pollutants and identify the best available methods for their control. These laws also require that the new source review rules for each air district include regulations establishing procedures to control the emission of these pollutants. The toxic emissions from natural gas combustion are listed in ARB's April 11, 1996 California Toxic Emissions Factors (CATEF) database for natural gas-fired combustion turbines. Cal-EPA has developed specific cancer potency estimates for assessing their related cancer risks at specific exposure levels. For noncancer-causing toxic air pollutants, Cal-EPA established specific no-effects levels (known as reference exposure levels, or RELs) for assessing the likelihood of producing health effects at specific exposure levels. Such health effects would be considered significant only when exposure exceeds these reference levels. The Energy Commission staff (staff) uses these Cal-EPA potency estimates and reference exposure values in its health risk assessments.

California Health and Safety Code section 44300 et seq. requires facilities, which emit large quantities of criteria pollutants and any amount of noncriteria pollutants to provide the local air district an inventory of toxic emissions. Such facilities may also be required to prepare a quantitative health risk assessment to address the potential health risks involved. The ARB and the Air Quality Management District will ensure implementation of these requirements for the proposed project.

LOCAL

The San Joaquin Unified Air Pollution Control District (SJUAPCD, or the District) has no specific rules implementing Health and Safety Code section 44300. It does, however, require the results of a health risk assessment as part of the application for the Determination of Compliance. Pastoria has complied with this requirement.

SETTING

According to information from the applicant (PEF 1999a, pages 1-3, 5.9-4, 3.5.9-5 and 5.16-1), the proposed facility will be located on a 30-acre site about 30 miles south of Bakersfield and 6.5 miles east of Grapevine, California. The site is on land

leased from the Tejon Ranch in a sparsely populated area of Kern County. It is currently undeveloped, covered by non-native grass and utilized for cattle grazing. The surrounding land is also undeveloped or used for agricultural production.

No developments have been proposed for the area within a 2-mile radius of the plant site. There are no parks, recreational, educational, religious, health care facilities, or commercial uses at the project site, or within a 1-mile radius of the site. This means that there are no significant point sources of criteria and noncriteria pollutants in the area. However, as discussed by the applicant, the project area is non-attainment (meaning that its ambient levels are currently higher than applicable air quality standards) for ozone and PM10 at the state and federal levels because of pollutant transportation from the other parts of the air basin. Such non-attainment status requires the offsetting of these two pollutants as contributed by Pastoria and any other new sources in the air basin.

Ozone is formed secondarily from the sunlight-driven interaction of its precursor pollutants (NOx and VOCs) transported from one point to the other. Since such transportation occurs throughout a given air basin, any ozone problem is considered a basin-wide problem for which a basin-wide control strategy is formulated by the local Air District with respect to sources of the precursor pollutants. This strategy consists of (a) emission control requirements with respect to each project's emissions and (b) offset requirements with respect to the basin-wide precursor transport.

PM10 also constitutes a basin-wide problem as derived from fugitive dust, the interaction of its precursors (which include NOx and VOCs), or emitted directly from sources throughout the air basin. Its emission from each given source could create a localized health problem when project-related exposures are added to the existing basin-wide, background levels. The potential for localized impacts is minimized through specific emission controls while its potential contribution on a basin-wide basis is minimized through specific offset requirements.

Because of the relative remoteness of the plant site, there are no locations with sensitive receptors (such as children and the elderly) within 10 miles of the project site. These sensitive receptors are usually more susceptible than the general population to the effects of environmental pollutants. Therefore, extra consideration is given to possible effects in these individuals in establishing exposure limits for environmental pollutants.

METHOD OF ANALYSIS

Any significant pollution-related impacts from this type of project would be mainly associated emissions from its natural gas-fired combustion turbines. Potential public exposure in the surrounding area is estimated through air dispersion modeling. It is these exposure estimates, along with data characterizing the existing conditions, that staff uses to establish whether total exposures will be above or below the applicable air quality standards or reference exposure levels established against noncancer effects. For cancer-causing (or carcinogenic) effects, such assessment is made in terms of the potential for exposure at levels whose related cancer risks are considered

significant by regulatory agencies. The procedure for evaluating the potential for these cancer and noncancer health effects is known as a health risk assessment process and consists of the following steps:

- A hazard identification step in which each pollutant of concern is identified along with possible health effects;
- A dose-response assessment step in which the relation between the magnitude of exposure and the probability of effects is established;
- An exposure assessment step in which the possible extent of pollutant exposures from a project is established for all possible pathways by dispersion modeling; and
- A risk characterization step in which the nature and the magnitude of the possible human health risk is assessed.

HEALTH EFFECTS ASSESSED

Health risks from a source of air pollutants can result from high-level exposure, which creates immediate-onset (acute) effects, or prolonged low-level exposure, which creates chronic effects. Noncancer effects are assumed to result after exposure above specific thresholds. Therefore, an analysis of the potential for these effects will include consideration of background or ambient levels of the toxic pollutants being assessed. Unfortunately, data on such levels is not usually available for the noncriteria pollutants associated with natural gas combustion unless there are major sources in the area. Such pollutants are generally emitted at relatively low levels as compared to the criteria pollutants, which are required to be measured and considered in assessing impacts.

For natural gas-burning facilities such as PEF, high-level exposure to toxic pollutants (which could cause acute effects) could occur only during major accidents and is not expected from routine operations when emissions are much lower. When the area is designated as non-attainment for a criteria pollutant, incidents of acute health impacts could increase with further additions of that same pollutant from a project.

Since acute health impacts are not associated with normal noncriteria pollutant emissions, effects from chronic exposures are considered of greater concern than acute effects in assessing the potential for impacts. Such chronic effects may manifest as cancer or health effects other than cancer. Only noncancer effects are expected from chronic exposures to the criteria pollutants.

ASSESSING THE LIKELIHOOD OF NONCANCER EFFECTS

The method used by regulatory agencies to assess the likelihood of acute or chronic pollutant impacts is the hazard index method. In this approach, a hazard index is calculated as a numerical representation of the likelihood of significant health impacts at the exposure levels expected for the source in question. This index is calculated by dividing the exposure estimate by the applicable reference exposure level or air quality standard. After calculating the hazard indices for the individual pollutants, these

indices are added together for all those that affect the same part of the body or target organ, to obtain a total hazard index. Total hazard indices of 1.0 or less are regarded as indicative of a potential lack of significant effects. However, exposure yielding a total hazard index of more than 1.0 may indicate a significant potential for the noncancer effects being considered.

In a non-attainment area, the hazard index for background exposures would be more than 1.0 for the criteria pollutant involved. For any proposed project, the hazard index for the operational phase would be obtained by dividing total (background plus project-related) exposure by the applicable air quality standard. Since all air quality standards are health-protective limits that are not to be exceeded, further additions from the project would necessitate additional mitigation with respect to the pollutant in question. The pollutant-specific hazard index that is calculated for the operational-phase exposure would facilitate the **Air Quality** staff's analysis to establish the level of mitigation necessary.

ASSESSING THE POTENTIAL RISK OF CANCER

According to present understanding, cancer from carcinogenic exposure results from biological effects at the molecular level. Such effects are currently assumed possible from every exposure to a carcinogen. Therefore, the likelihood of cancer is generally considered by staff and other regulatory agencies as more sensitive than the likelihood of noncancer effects for assessing the environmental acceptability of a source of pollutants. This accounts for the prominence of theoretical cancer risk estimates in the environmental risk assessment process.

For any source of specific concern, the potential risk of cancer is obtained by multiplying the exposure estimate by the potency factors for the individual carcinogens involved. These potency factors are numerical values established to represent the cancer-causing potential of one carcinogen as compared to the others. After calculating these individual risk values, they are added together for the project's carcinogens to obtain the total incremental cancer risk associated with operations. Given the conservatism in the various phases of this risk calculation process, these numerical estimates are regarded as only representing the upper bounds on the cancer risk at issue. The actual risk will likely be lower and could indeed be zero. The significance of these estimates as indicators of a real cancer hazard is assessed according to specific evaluative criteria.

STAFF'S SIGNIFICANCE CRITERIA

Various state and federal agencies specify different cancer risk levels as levels of significance with regard to specific sources. For example, a risk of 10 in a million is considered under the Air Toxics "Hot Spots" (AB 2588) and the Proposition 65 programs as significant, and therefore, used as a threshold for public notification in cases of air toxics emissions from existing sources. The San Joaquin Unified Air Pollution Control District considers the same risk of 10 in a million as acceptable for a source (such as PEF) in which the best available control technology for air toxics (T-BACT) is used.

The Energy Commission staff considers a potential cancer risk of one in a million as the de minimis level, which is the level below which the related exposure is negligible (meaning that project operation is not expected to result in any increase in cancer). Above this level, further mitigation could be recommended after consideration of issues related to the limitations of the risk assessment process.

For noncarcinogenic pollutants, staff considers significant health impacts to be unlikely when the hazard index estimate is 1.0 or less. If more than 1.0, staff would regard the related emissions as potentially significant from an environmental health perspective but would recommend specific mitigation only after consideration of issues related to the uncertainties in the assessment process.

IMPACTS

PROJECT SPECIFIC IMPACTS

The health impacts from the siting and operation of the proposed Pastoria Project can be considered separately as construction-phase impacts and operational-phase impacts.

CONSTRUCTION PHASE IMPACTS

Construction-phase impacts, as noted by the applicant (PEF 1999a, pages 5.2-23 through 5.2-25 and 5.16-2) are those from human exposure to (a) the windblown dust from site grading and other construction-related activities and (b) emissions from the heavy equipment and vehicles to be used for such construction. Upon reviewing their method and data, staff finds that the applicant used an acceptable procedure for estimating the project's construction-related PM10 levels from fugitive dust generation.

While a phase I site assessment (PEF 1999a, page 4.14-6) did not provide any evidence of significant surface or subsurface contamination, it did not eliminate the possibility of localized pockets of such contamination within the site. The applicant intends to safely dispose of all such contaminated soils whenever encountered in the site-grading phase. Such safe removal would ensure that construction workers are not exposed to contaminated fugitive dust. The procedures for minimizing such dust are addressed in the **Air Quality** section. Staff considers these procedures as adequate for such purposes.

The applicant has identified the construction-phase vehicles to be used, along with their respective pollution emission rates for the relatively short (24-month) construction period (PEF 1999a, page 5.16-2). They also modeled and presented the concentrations of the pollutants of potential health significance in this regard (PEF 1999a, pages 5.2-24 and 5.2-25, Appendix I-5). Maximum impacts are expected around the project's property line (PEF 1999a, page 5.2-25), meaning that there would be no public exposures. Since chronic impacts are not usually expected from equipment emissions within this relatively short construction period, only acute health

effects could be significant in the project's impact areas. Given the relatively low exposure levels involved and the absence of potentially exposed public, staff does not expect these emissions to pose a significant risk of such acute health impacts.

DIRECT OPERATIONAL IMPACTS

The applicant conducted the health risk assessment for the project-related noncriteria pollutants of potential significance. This assessment was conducted according to procedures specified in the 1993 California Air Pollution Control Officer's Association (CAPCOA) guidelines for sources of this type. The results were provided to staff along with documentation of the assumptions used (PEF 1999a, pages 5.16-2 through 5.16-7). Such documentation was provided with regard to the following:

- Pollutants considered;
- Emission levels assumed for the pollutants involved;
- Dispersion modeling used to estimate potential exposure levels;
- Exposure pathways considered;
- The cancer risk estimation process;
- Hazard index calculation; and
- Characterization of project-related risk estimates.

Staff has found these assumptions to be generally acceptable for evaluating the proposed project. We concur with the applicant's findings with regard to the numerical public health risk estimates expressed either in terms of the hazard index for each noncarcinogenic pollutant, or a cancer risk for estimated levels of the carcinogenic pollutants. These analyses were conducted to establish the potential for acute and chronic effects on body systems such as the liver, central nervous system, the immune system, kidneys, the reproductive system, the skin and the respiratory system.

IMPACTS ASSOCIATED WITH THE PROJECT'S NONCRITERIA POLLUTANTS.

The following noncriteria pollutants were considered with respect to noncancer effects: ammonia, in case of use of the selective catalytic reduction (SCR) system alternative for NOx control, acetaldehyde, acrolein, benzene, 1,3 butadiene; ethylbenzene, formaldehyde, hexane, naphthalene, polycyclic aromatic hydrocarbons (PAHs), propylene oxide, toluene, and xylenes. The following were considered with regard to a possible cancer risk: acetaldehyde, benzene, 1,3 butadiene, formaldehyde, PAHs and propylene oxide.

A chronic hazard index of 0.14 was calculated (PEF 1999a, page 5.16-7) for the maximum impact location (approximately 2.1 Km southeast of the project), using the alternative SCR for NOx control. With the use of the XONON system as proposed, this hazard index would decrease slightly to 0.12 because of the absence of ammonia. An acute hazard index of 0.57 for the same maximum impact location was calculated for the project using the alternative SCR system. With the proposed XONON system, this index would decrease to 0.54. These indices are all below the levels of potential health significance, suggesting that no significant health impacts would likely be

associated with the project's noncriteria pollutants whether NOx is controlled using XONON or the alternative SCR system as discussed more fully in the **Air Quality** section.

The highest combined cancer risk was estimated to be 0.56 in a million for an individual at the same maximum location identified for the total hazard indices for acute and chronic effects. This risk was calculated using existing procedures, which assume that the individual would be exposed at the highest possible levels to all the carcinogenic pollutants from the project for 70 years. This risk value is below staff's de minimis level and would not change with the use of SCR since the ammonia of concern with the use of SCR is not a carcinogen. It is also significantly below the level considered acceptable by the Air District for sources such as PEF.

IMPACTS ASSOCIATED WITH THE PROJECT'S CRITERIA POLLUTANTS

Only ozone and PM10 were considered among the project's criteria pollutants, because of the project area's noted designation as non-attainment for both pollutants. As presented in the **Air Quality** section, the highest area background ozone concentration as measured in 1998 is 0.143 parts per million (ppm), which, when divided by the state's 1-hour 0.09 ppm standard (which is not to be exceeded), yields a maximum background hazard index of 1.59.

A maximum background PM10 level of 170 ug/m3 was measured in 1991 in the project area. Dividing this by the state's 24-hr standard of 50.1 ug/m3 would yield a hazard index of 3.4, pointing to a background health hazard. The emission controls and offset requirements to mitigate Pastoria's additions are specified in the **Air Quality** section with respect to both PM10 and ozone.

CUMULATIVE IMPACTS

When toxic pollutants are emitted from multiple sources within a given area, the cumulative, or additive, impacts of such emissions could, in concept, lead to significant health impacts within the population, even when such pollutants are emitted at insignificant levels from the individual sources involved. Analyses of such emissions have shown, however, that the peak impacts of such toxic pollutants are normally localized within relatively short distances from the source. Toxic pollutant levels beyond the point of maximum impact normally fall within ambient background levels. We note in this case that the point of maximum impacts was identified as a location only 2.1 Km from the project site. Therefore, potentially significant cumulative impacts are only expected in situations where new sources are located adjacent to one another. Since no significant pollutant sources are presently located or proposed for the OMGP's impact areas, no exposures of a cumulative nature are expected during the project operational phase.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff has determined that the construction and operation of the proposed natural gas-burning project will not pose a significant public health risk to the surrounding population with regard to the toxic pollutants considered. However ozone and PM10 levels are encountered at background levels posing a significant hazard to human health. The mitigation measures in the **Air Quality** section are acceptable to staff and are in keeping with the Air District's plans for an orderly, basin-wide reduction of this health hazard.

RECOMMENDATIONS

Since ozone and PM10 are encountered in the project area at potentially hazardous levels, staff recommends adoption of the ozone and PM10-specific mitigation measures and conditions of certification specified in the **Air Quality** section. No significant public health impacts are considered likely by staff with regard to toxic emissions from the proposed project. Therefore, no Public Health Conditions of Certification are proposed with respect to these pollutants.

REFERENCES

California Air Resources Board (ARB) 1996. California Toxic Emissions Factors (CATEF) Database for Natural Gas-Fired Combustion Turbine Cogeneration.

California Air Pollution Control Officers Association (CAPCOA) 1993. Air Toxics "Hot Spots" Program, Revised 1992 Risk Assessment Guidelines. Prepared by the Toxics Committee, October 1993.

PEF (Pastoria Energy Facility). Application for Certification, AFC, Volumes I and II, Pastoria Energy Facility Project (AFC-99-7). Submitted to the California Energy Commission on November 30, 1999.

WORKER SAFETY AND FIRE PROTECTION

Kathleen Hann

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, which 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 analysis is to assess the worker safety and fire protection measures proposed by Pastoria Energy Facility, Limited Liability Corporation (LLC), for the Pastoria Energy Facility (PEF). Staff has reviewed both the original Application for Certification (November, 1999) and the December 29, 1999 Supplement to AFC, "Response to CEC Data Adequacy Comments" to determine whether the PEF has proposed adequate measures to:

- comply with applicable safety laws, ordinances, regulations and standards (LORS);
- protect the workers during construction and operation of the facility;
- protect against fire; and
- provide adequate emergency response procedures.

Staff has determined that the features of the project comply with applicable LORS and do not present unusual industrial safety or fire protection problems. Issues relating to the project's impacts to local fire protection service capabilities and appropriate mitigation have not yet been resolved and are addressed under proposed conditions of certification, **Worker Safety –3.**

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 (the Act). The 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). This public law is published at Title 29 of the Code of Federal Regulations, under General Industry Standards, Parts 1910.1 through 1910.1450 (29 CFR Part 1910.1 - 1910.1450). It defines 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 safety and health standards now in force under the Act for general industry

represent a compilation of materials authorized by the Act 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 Federal Department of Labor established the Occupational Safety and Health Administration (OSHA) in 1971 to discharge the responsibilities assigned by the Act.

Applicable Federal requirements include:

- 29 U.S. Code § 651 et seq. (Occupational Safety and Health Act of 1970)
- 29 CFR Part 1910.1 - 1910.1450 (Occupational Safety and Health Administration Safety and Health Regulations)
- 29 CFR Part 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 Part 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 resulting from the Act are published at Title 8 of the California Code of Regulations, beginning with Part 450 (8 CCR Part 450 et seq.) The California Labor Code requires that the State Standards Board must adopt standards at least as effective as the federal standards (Calif. Labor Code §142.3(a)). State Health and Safety laws 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 Parts 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 administers the Cal/OSHA plan and oversees 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 (Calif. Labor Code § 6408), principally through the use of the Material Safety Data Sheet (MSDS) (8 CCR § 5194). This regulation was promulgated in response to California's Hazardous Substances Information and Training Act of 1990 (1980 Calif. § 874 and Calif. Labor Code §§ 6360-6399.7). It mirrored the Federal Hazard Communication Standard (29 CFR Part 1910.1200) which established an employee's "right to know" about chemical hazards in the workplace.

Finally, California Senate Bill 198 required that employers establish and maintain a written Injury and Illness Prevention Program to identify workplace hazards and communicate them to its employees through a formal employee training program (8 CCR 3203).

Applicable State requirements include:

- 8 CCR § 339 - List of hazardous chemicals relating to the Hazardous Substance Information and Training Act
- 8 CCR § 450, et seq. Cal/OSHA regulations
- 24 CCR § 3, et seq. - incorporates the current edition of the Uniform Building Code
- La Follette Bill (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 § 255000 - 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, (24 CCR § 3, et seq.) is comprised 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 Uniform 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 the California Code of Regulations pertaining to the California Fire Code (24 CCR Part 9).
Similarly the Uniform Fire Code Standards, a companion publication to the California Fire Code, contains 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.

Applicable local requirements include:

- 1998 Edition of California Fire Code and all applicable NFPA standards (24 CCR Part 9)
- Uniform Fire Code Standards
- California Building Code Title 24, California Code of Regulations (24 CCR § 3, et seq.)

SETTING

The PEF is proposed for construction on an undeveloped site of Tejon Ranch in Kern County, about 30 miles south of Bakersfield and about 6.5 miles east of Interstate 5 at the base of the Tehachapi Mountains. The 30-acre site is adjacent to an existing gravel quarry. The Kern County Fire Department (KCFD) has jurisdiction for fire support service at the PEF and vicinity. Mettler Station 55 is currently the closest fire station to the proposed PEF site . It is located 16 miles northwest of the project site with an estimated response time of 10 minutes. However, an industrial complex has been approved for development near the Grapevine area, and the KCFD will relocate the Mettler Station 55 to the industrial complex site to provide initial emergency response to both PEF and the industrial complex facilities. Lebec Station 56 and Arvin Station 54 would provide back-up support. The Landco Station 66 in Bakersfield would provide hazardous materials response. An additional station in Bakersfield, Virginia Colony Station 41, houses an aerial ladder truck for high angle and confined space rescue. See **Worker Safety Figure 1** for a location map of the stations.

WORKER SAFETY Table 1 provides an outline of the equipment and personnel at each station. Following is a general description of the response equipment listed:

- Type I fire engine is a primary response unit. It has a minimum 400-gallon water tank, a minimum of 1,200 feet of 2 ½ " hose or larger, 200 feet of 1' hose, a 20 to 24 extension ladder and a 500-gpm (gallons per minute) heavy stream appliance. This apparatus also has Basic Life Support (BLS) medical treatment capabilities.
- Type 4 squad is a four-wheel drive (FWD) vehicle used for brush fire or watershed patrol
- A Hazardous Material Unit is a van for hazardous material response and technical rescue
- Ladder Truck is also a primary response unit . It has a 100-foot extension ladder with basket, and stream capability of 1,500 gpm.

WORKER SAFETY AND FIRE PROTECTION Figure 1

Pastoria Energy Facility – Fire Station Locations

WORKER SAFETY AND FIRE PROTECTION Table 1
Fire Station/Fire Protection Capabilities

Station	Response time	Equipment	Personnel per shift
Kern County Fire Department Mettler Station 55 1801 Mettler Road West Mettler, CA 93313 (661) 858-2490 TO BE RELOCATED	16 miles northwest from project site. Estimated response time: 10 minutes	1– Type I Engine 1 – Type 4, FWD watershed Patrol	1 Captain 1 Engineer
Kern County Fire Department Lebec Station 56 1548 Golden State Hwy Lebec, CA 93243 (661) 248-6426	16 miles south of project site. Estimated response time: 13-14 minutes	2– Type I Engines 1 – Type 4, FWD watershed Patrol	1 Captain 1 Engineer 1 Firefighter
Kern County Fire Department Arvin Station 54 301 Campus Drive Arvin, CA 93203 (661) 854-5517	30 miles north from project site. Estimated response time: 30 minutes	2– Type I Engines 1 – Type 4, FWD watershed Patrol	1 Captain 1 Engineer 1 Firefighter
Kern County Fire Department Landco Station 66 3000 Landco Drive Bakersfield, CA 93308 (661) 861-2566	30 miles north from project site. Estimated response time: 30 minutes	2– Type I Engines 1 – Type 4, FWD watershed Patrol 1 – Hazardous Material Unit	1 Captain 1 Engineer 3 Firefighters
Kern County Fire Department Virginia Colony Station 41 2214 Virginia Avenue Bakersfield, CA 93307 (661) 326-1626	30 miles north from project site. Estimated response time: 30 minutes	1 – Type I Engine 1 – Type 4 FWD watershed Patrol 1 - Ladder Truck	2 Captains 2 Engineers 2 Firefighters 1 Battalion Chief

IMPACTS

PROJECT SPECIFIC IMPACTS

FIRE PROTECTION

Staff reviewed the information provided in the AFC regarding available fire protection services and equipment (Section 5.17 Worker Safety, and Section 3.4.12 Fire Protection and Safety Systems), to determine if the project would adequately protect workers and if it would impact the fire protection services in the area. The project will rely on both onsite fire protection systems and local fire protection services.

The information in the AFC indicates that the proposed fire protection system at the site will support the Project. It will include: 1) carbon dioxide fire protection system to protect the combustion turbine, generator, and accessory equipment, with fire detection sensors; 2) a deluge spray system to protect the generator transformers, steam turbine oil system, and auxiliary power transformer; 3) fire hydrants/hose stations to supplement fire protection systems; 4) a sprinkler system to protect administration, warehouse, chiller, water treatment and maintenance buildings; and 5) smoke detectors, combustible gas detectors, and fire extinguishers installed consistent with the California Building Code at locations with potential fire hazards due to combustible or flammable materials, and where major property damage could occur.

Water will be supplied by underground fire water/domestic water system, located according to the fire design code requirements. The Wheeler Ridge-Maricopa Water Storage District will be the primary supply of water. Firewater will be stored in the Makeup Water Storage Tank which will hold 500,000 gallons of water. A plant firewater loop will reach all parts of the facility. Dual check valves will prevent back flow to the tank. A firewater pump skid will supply the firewater loop as a backup system, using raw water from the water supply pipeline or cooling tower basins. Fire hydrants will be located and hose houses will be equipped in accordance with NFPA 24 and KCFD codes. Firewater pumps will be installed according to NFPA 20. The firewater system will be designed at a capacity of 3000 gpm.

The KCFD has indicated that there is a deficiency in response time by the first responding staffed equipment of the Fire District. The first responder is the Mettler Station 55 which is 10 minutes away. Because the Tejon Industrial Complex was approved for development on the east side of Interstate-5 near the Grapevine, the Mettler Station will be relocated to that area. This will adequately reduce response time by over one-half, to about 4-5 minutes. Equipment and number of personnel at the station will transfer to the new location. KCFD also expects to add one additional firefighter to each shift at the relocated station. PEF will share in the mitigation costs. This is addressed in **Worker Safety-3**. The ladder truck, which provides elevated stream fire suppression and rescue capabilities required for the Project, is housed in Bakersfield. A new ladder truck has been ordered and will be

located at the Taft Station late in 2000. Either station's response is about 30-35 minutes. Although Bakersfield is farther away, travel on Highway 99 and Interstate 5 is faster than travel on the rural road from Taft.

Comments received from the Kern County Planning Department indicated that conditions of certification should include fire flows, access, and fire protection facilities as required and approved by the KCFD. The applicant will be required to provide final diagrams and plans to staff and to the KCFD, prior to construction and operation of the project, to confirm the adequacy of the proposed fire protection measures. All Fire Department access roads, water mains, and fire hydrants shall be installed and operational during construction in accordance with Article 87 of the Fire Code. A final inspection by the Fire Department will be required to confirm that the facility meets all the Fire and Building Code requirements.

WORKER SAFETY

Industrial environments are potentially dangerous. Workers are exposed to chemical spills, hazardous waste, fires, moving equipment, and confined space entry and egress problems. It is important for PEF to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers. During both construction and operation of the project, Pastoria Energy Facility, LLC is responsible for all PEF employees.

A Phase I Environmental Site Assessment was conducted at the site to evaluate the property conditions defined by the project. The results of the study identified the potential presence of hazardous substances or petroleum products that may impact the property. In response the project was modified to reduce or avoid impacts from contamination (Scholl 2000a). However, recommendations made as a result of the study indicate that soil sampling may be required to characterize oil-stained soil present at the location of the proposed fuel gas supply pipeline within the Tejon Hills Oil Field and vicinity. If the final engineering design shows that Route 3 will not be impacted by the oil-stained soil in the Tejon Hills Oil field, sampling will not be conducted.

Otherwise, characterization will identify chemical constituents of concern in the oil field crude. It will provide guidance in developing a health and safety plan for worker safety during the construction of the natural gas pipeline, and mitigation during construction. Soil sample analyses will identify total petroleum hydrocarbons, volatile organic compounds, semivolatile organic compounds, and metals regulated by the State of California. A soil management plan will be developed to manage the oil-stained soil consistent with construction practices in Kern County and with the requirements Kern County Environmental Health Services.

The proposed health and safety policies at PEF provide for construction and ongoing operations, including incidental construction activities, and address safety programs, personal protection equipment and fire suppression.

MITIGATION

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 PEF project encompasses the construction and operation of a 750 MW natural gas-fired facility, and construction and operation of ancillary facilities, including transmission lines, switchyard, pipelines, and access road. The facility will incorporate three combustion turbine generators operating in combined cycle mode. Workers will be exposed to hazards typical of construction and operation of a gas-fired combined cycle facility.

Construction Safety Orders are published at Title 8 of the California Code of Regulations beginning with section 1502 (8 CCR § 1502, et seq.). These requirements are promulgated by Cal/OSHA and are applicable to the construction phase 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)
- 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 as needed:

- 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
- Confined Space Entry Program
- Hand and Portable Power Tool Safety Program
- Hearing Conservation Program
- Back Injury Prevention Program
- Hazard Communication Program

During construction, a hazard analysis will be performed to evaluate the hazards and develop appropriate programs/plans to address any hazards that are not included above.

The AFC includes adequate overviews of each of the above programs. Prior to construction activities at the PEF, detailed programs and plans will be provided to comply with the condition of certification **WORKER SAFETY-1.**

OPERATION SAFETY AND HEALTH PROGRAM

Upon completion of construction, existing procedures and policies will be extended to cover activities at the new operating units. Worker safety procedures for new employees will be the same as for existing operations. Operations Safety and Health Program was prepared pursuant to regulatory requirements of Title 8 of the California Code of Regulations. The PEF's Operation Safety and Health Program includes the following programs and plans:

- Injury and Illness Prevention Program (8 CCR § 3203)
- Emergency Action Program/Plan (8 CCR § 3220);
- Fire Protection and Prevention Program (8 CCR § 3221); and
- Personal Protective Equipment Program (8 CCR §§ 3401-3411)

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 as needed:

- Motor Vehicle and Heavy Equipment Safety Program
- Forklift Operation Program
- Excavation/Trenching Program
- Fall Protection Program
- Scaffolding/Ladder Safety Program
- Crane and Material Handling Program
- Hazard Communication Program
- Hot Work Safety Program
- Respiratory Protection Program

- Electrical Safety Program
- Confined Space Entry Program
- Hand and Portable Power Tool Safety Program
- Housekeeping and Material Handling and Storage Program
- Hearing Conservation Program
- Back Injury Prevention Program
- Safe Driving Program

These plans may require updating if operations change or if new equipment is added.

The AFC includes adequate overviews of each of the above programs. Prior to operation of the PEF, detailed programs and plans will be provided to comply with the condition of certification **WORKER SAFETY-2.**

SAFETY AND HEALTH PROGRAM ELEMENTS

PEF provided the proposed outlines for a Construction Safety and Health Program and 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)

PEF will submit an expanded Construction and Operations Illness and Injury Prevention Program to Cal/OSHA for review and comment 30 days prior to construction of the project.

Cal/OSHA will review and provide comments on the IIPP as the result of an onsite consultation at PEF's request. A Cal/OSHA representative will complete a physical survey of the site, analyze work practices, and assess those practices that may likely result in illness or injury. This on-site consultation will give CAL/OSHA an opportunity to evaluate PEF’s IIPP in conjunction with the activities occurring on site.

EMERGENCY ACTION PLAN

California regulations require an Emergency Action Plan (8 CCR § 3220) which should provide specific procedures to be followed in the event of an emergency situation. Potential emergencies include, but are not limited to, spill or release of hazardous materials, fire, explosion or natural disaster. PEF submitted an adequate Emergency Action Plan outline in the AFC. The plan will include:

- Emergency escape procedures and emergency escape route assignments
- Procedures to be followed by employees who remain to operate critical plant operations before they evacuate

- Procedures to account for all employees after emergency evacuation has been completed
- Rescue and medical duties for employees
- Fire and emergency reporting procedures
- Alarm and communication system
- Contact personnel
- Response procedures for ammonia release (or other hazardous materials)
- Training requirements

Staff proposes condition of certification **WORKER SAFETY-2**, which requires PEF to submit a final Operation's Emergency Action Plan to Cal/OSHA for review and comment during initial operations. Staff also proposes that PEF submit the latest revision to the Emergency Action Plan to the KCFD for review and approval to satisfy proposed conditions of certification **WORKER SAFETY 1** and **2**.

FIRE PREVENTION PLAN

California Code of Regulations requires an Operation Fire Prevention Plan (8 CCR § 3221). The AFC did not contain a proposed fire prevention plan. The plan will need to include the following topics:

- General requirements
- Fire hazard inventory, including ignition sources and mitigation
- Housekeeping and proper materials storage
- Employee alarm/communication system
- Portable fire extinguishers
- Fixed fire fighting equipment
- Fire control
- Flammable and combustible liquid storage
- Use of flammable and combustible liquids
- Dispensing and disposal of liquids
- Training
- Contact personnel
- Local fire protection services

Staff proposes that PEF submit a copy of the Fire Prevention Plan to the California Energy Commission Compliance Project Manager (CPM) and the KCFD for review and approval to satisfy proposed conditions of certification **WORKER SAFETY 1** and **2**.

PERSONAL PROTECTIVE EQUIPMENT PROGRAM

California regulations stipulate that Personal Protective Equipment (PPE) and first aid supplies are required whenever hazards are encountered which, 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). PEF's operational environment will require PPE.

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. PEF provided a satisfactory outline that identifies minimum requirements of a proposed PPE program.

The components of PEF's program as outlined include:

- Personal Protective Equipment Policy – Presents safety procedures regarding respiratory protection, eye protection, footwear and head protection. It includes the selection of suitable equipment, proper fitting, training, limitations and maintenance.
- Hard Hat Policy – Describes in additional detail the use, inspection and care of hard hats.
- Eye and Face Protection Policy – Describes the requirements for use of approved eye and face protection. It covers numerous types of eye and face protection, respective fit, inspection and care.

Staff evaluated PEF's PPE policies and assessed that the PPE Program contains the elements that will meet applicable regulations and will significantly reduce the potential impact upon workers.

GENERAL SAFETY

In addition to the specific plans listed above, there are additional LORS applicable to the project, which are called "safe work practices".

Safety Action Plan for Contractors

This is a guide for contractors to follow in developing their individual safety programs as required by Cal/OSHA.

Confined Space Entry

The California Code of Regulations identifies the minimal standards for preventing employee exposure to dangerous air contaminants and/or oxygen deficiency in confined spaces, where there is an oxygen-deficient atmosphere, a limited means of egress, or a source of toxic of flammable contaminants (8 CCR Sections 5156-5168). Confined spaces include silos, tanks, vats, vessels, boilers, compartments, ducts, sewers, pipelines, vaults, bins and pits. PEF confined space entry procedures must include:

- Air monitoring and ventilation requirements
- Rescue procedures

- Lock-out / tag-out and blocking, blinding, and blanking requirements
- Permit completion
- Training

Tailgate Briefings Procedure

This procedure defines consistent format for conducting tailgate meetings that focus on work procedures necessary to safely and efficiently accomplish the job, including identifying and eliminating potential hazards to employees.

Plant Safety Committee

The Committee provides employees an opportunity to identify safety problems and recommend appropriate hazard controls to the Plant Manager. The Committee is designed to enable the employees to actively participate in various phases of the safety program, and to utilize their knowledge and experience in formulating recommendations and safety program objectives.

Hazard Communication Program

The Hazard Communications Standard establishes an employee's right to know about chemical hazards in the workplace. In accordance with federal and State requirements, the Hazard Communication Manual for PEF should provide information about hazardous substances and their control through a comprehensive Hazard Communication Program, which includes:

- Preparing and maintaining hazardous materials inventory list
- Providing material safety data sheets
- Training employees
- Labeling containers
- Informing employees about hazardous nonroutine tasks
- Informing contractors about potential hazards and necessary precautions

CUMULATIVE IMPACTS

The construction and operation of the PEF project could result in impacts on the fire and emergency service capabilities of the KCFD. Staff has discussed with the KCFD the fire protection equipment and services required for the facility. KCFD representatives will discuss their concerns regarding mitigation with PEF. Staff will address mitigation requirements in more detail in the Final Staff Assessment. Staff's recommended condition of certification **Worker Safety-3** will ensure that the PEF's contribution to cumulative impacts to the Fire Department's fire protection and emergency service capabilities will be adequately mitigated.

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.

CONCLUSION AND RECOMMENDATIONS

CONCLUSIONS

If PEF provides a Construction Safety and Health Plan, and an Operation Safety and Health Plan, as required by conditions of certification **WORKER SAFETY - 1, and - 2,** and provides assurance that fire protection impacts have been mitigated, as required by conditions of certification **WORKER SAFETY - 3**, staff believes that the project will incorporate sufficient measures to ensure adequate levels of industrial safety, and comply with applicable LORS.

RECOMMENDATIONS

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 Project Construction and Operation Safety and Health Programs proposed by PEF will be reviewed by the appropriate agencies before implementation. The proposed conditions will also assure mitigation of impacts to fire protection services. 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 CPM a copy of the Project Construction Safety and Health Program, containing the following:

- a construction Injury and Illness Prevention Program
- a construction Fire Protection and Prevention Plan
- a personal Protective Equipment Program

Protocol: The Construction Injury and Illness Prevention Program and the Personal Protective Equipment Program shall be submitted to the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) Consultation Service during the initial construction period, for review and comment concerning compliance of the program with all applicable Safety Orders. The project owner shall schedule a site visit with Cal/OSHA during construction.

The Construction Fire Protection and Prevention Plan shall be submitted to the Kern County Fire Department for review and acceptance.

Verification: At least 30 days prior to the start of construction, or a date agreed to by the CPM, the project owner shall submit to the CPM a copy of the Project Construction Safety and Health Program and the Personal Protective Equipment Program. The project owner shall provide a letter from the Kern County Fire Department stating that they have reviewed and accepted the Construction Fire Protection and Prevention Plan.

The project owner shall provide a copy of the cover letter to Cal/OSHA's Consultation Service requesting review and comment of the Construction Injury and Illness Prevention Program and the Personal Protective Equipment Program. The project owner shall inform the CPM of Cal/OSHA site visits and inspection results.

WORKER SAFETY– 2 The project owner shall submit to the CPM a copy of the Project Operation Safety and Health Program containing the following:

- an operation Injury and Illness Prevention Plan
- an emergency Action Plan
- an operation Fire Protection Plan
- a personal Protective Equipment Program

Protocol: The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) Consultation Service during initial operations, for review and comment concerning compliance of the program with all applicable Safety Orders. The project owner shall schedule a site visit with Cal/OSHA during initial operations.

The Operation Fire Protection Plan and the Emergency Action Plan shall be submitted to the Kern County Fire Department for review and acceptance.

Verification: At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the final version of the Project Operation Safety & Health Program, and Kern County Fire Department comments, stating that they have reviewed and accepted the specified elements of the proposed Operation Safety and Health Plan.

The project owner shall provide a copy of the cover letter to Cal/OSHA's Consultation Service requesting review and comment of the Operation Injury and Illness Prevention Program and the Personal Protective Equipment Program. The project owner shall inform the CPM of Cal/OSHA site visits and inspection results.

The project owner shall notify the CPM that the Project Operation Safety and Health Program (Injury and Illness Prevention Plan, Fire Protection Plan, the Emergency Action Plan, and Personal Protective Equipment requirements), including all records and files on accidents and incidents, is present on-site and available for inspection.

WORKER SAFETY– 3 The project owner shall reach an agreement with the Kern County Fire Department on the fees and payment for additional staffing of personnel, or other alternative mitigation measures agreeable to the Kern County Fire Department and the project owner.

Protocol: PEF shall meet with representatives of the Kern County Fire Department to discuss mitigation of the cumulative impacts and to reach an agreement on a one-time payment to the Kern County Fire Department to cover the costs of three new personnel for one year, at one additional firefighter for three shifts per day. Alternative mitigation measures have yet to be negotiated and will be addressed in the Final Staff Assessment.

Verification: Not later than 30 days prior to any ground disturbance, the project owner shall provide the CPM with a copy of an agreement with the Kern County Fire Department relative to the agreed-upon fees and payment for the additional staffing, or other alternative mitigation measures.

REFERENCES

PEF (Pastoria Energy Facility) 1999a.. Application for Certification, Volumes I and II, Pastoria Energy Facility Project (99-AFC-7). Submitted to the California Energy Commission, November 30, 1999.

PEF (Pastoria Energy Facility) 2000a. Response to CEC Data Adequacy Comments; dated December 29, 1999 (Supplement to AFC-99-7). Submitted to the California Energy Commission on January 5, 2000.

PEF (Pastoria Energy Facility/Scholl) 2000a. Response to Data Requests 2000 (First Data Response submittal). Submitted to the California Energy Commission on March 13, 2000.

TRANSMISSION LINE SAFETY AND NUISANCE

Obed Odoemelam

INTRODUCTION

The transmission line for the proposed Pastoria Energy Facility PEF, or Pastoria) is a double-circuit overhead 230 kV line connecting the facility's switchyard to Southern California Edison's (SCE) electrical transmission system. Connection to the SCE system will be made at the existing Pastoria Substation, which is located southwest of the project. This new line will run adjacent and parallel to several existing SCE transmission lines (Pastoria 1999a, pages 3.1-4, and 3.6-1). Since the line is within the SCE service area, it will be designed according to existing SCE guidelines and construction practices reflecting compliance with applicable laws, ordinances, regulations and standards (LORS). The purpose of this analysis is to assess the proposed construction and operational plan for incorporation of the measures necessary for such compliance. If compliance is established, staff will recommend approval of the line with respect to the issues of concern; if not, staff will recommend revisions as appropriate.

Staff's analysis will focus on issues, which relate primarily to the physical presence of the line, or secondarily to the physical interactions of line 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 transmission lines as proposed for Pastoria. The impacts of concern are addressed through specific federal or state regulations or through 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.

AVIATION SAFETY

Any hazard to area aircraft relates to the potential for collision with the line in the navigable air space. The applicable federal LORS as discussed below are intended to ensure the distance and visibility necessary to avoid such collisions.

FEDERAL

- Title 14, Part 77 of the Federal Code of Regulations (CFR), “Objects Affecting the Navigation Space” Provisions of these regulations specify the criteria used by the Federal Aviation Administration (FAA) for determining whether a “Notice of Proposed Construction or Alteration” is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved. Such notification allows the FAA to ensure that the structure is located to avoid any significant hazards to area aviation.
- FAA Advisory Circular (AC) No. 70/460-2H, “Proposed Construction and or Alteration of Objects that may Affect the Navigation Space” This circular informs each proponent of a project that could pose an aviation hazard of the need to file the “Notice of Proposed Construction or Alteration” (Form 7640) with the FAA.
- FAA AC No. 70/460-1G, “Obstruction Marking and Lighting”. This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

Transmission line-related radio-frequency interference is one of the indirect effects of line operation produced by the physical interactions of line electric fields. The level of such interference usually depends on the magnitude of the electric fields involved. Because of this, the potential for such impacts could be assessed from field strength estimates obtained for the line. The following regulations are intended to ensure that such lines are located away from areas of potential interference and that any interference is mitigated whenever it occurs.

FEDERAL

- Federal Communications Commission (FCC) regulations in Title 47 CFR, Section 15.25. Provisions of these regulations prohibit operation of any devices producing force fields, which interfere with radio communications, even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. Such interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as corona discharge but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings. When generated, such noise manifests as perceivable interference with radio or television signal reception or interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The FCC requires each line operator to mitigate all

complaints about interference on a case-specific basis. Staff usually recommends specific conditions of certification to ensure compliance with this FCC requirement.

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 in 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 regulations to limit the audible noise from transmission lines. As with radio noise, such noise is limited instead through design and maintenance standards established from industry research and experience as effective without significant impacts on line safety, efficiency maintainability and reliability. All high-voltage lines are designed to assure compliance. Such 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. Since (as with communications interference), the noise level depends on the strength of the line electric field, the potential for occurrence can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during wet weather and from lines of 345 kV or higher. It is, therefore, not generally expected at significant levels from lines of less than 345 kV such as the one proposed for Pastoria. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a 100-ft right-of-way.

NUISANCE SHOCKS

INDUSTRY STANDARDS

There are no design-specific federal regulations to limit nuisance shocks in the transmission line environment. For modern high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code 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 lines of the type proposed, the applicant will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff usually recommends specific conditions of certification to ensure that such grounding is made within the right-of-way by both the applicant and property owners.

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 that are addressed by the following regulations and standards are those that could result from direct or indirect contact between an individual and the energized line. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines.

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, CCR, Section 2700 et seq., "High Voltage Electric Safety Orders". These safety orders establish essential requirements and minimum standards for safely installing, operating, and maintaining electrical installations and equipment.

INDUSTRIAL STANDARDS

There are no design-specific federal regulations to prevent hazardous shocks from power lines. Safety is assured through 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 considering both as EMF exposure. As noted by the applicant, (Pastoria 1999a, pages 4-6 through 4-8), the available evidence as evaluated by CPUC and other regulatory agencies, 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 reduce such fields to some degree, where feasible, until the issue is better understood. The challenge has been to establish when, and how far to reduce them.

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 design guidelines 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 PUC policy resulted from assessments made to implement CPUC Decision 93-11-013 of 1989.

In keeping with this CPUC policy, staff requires evidence that each proposed 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. It is therefore, up to each applicant to ensure that such measures are applied in ways, and to an

extent, without significant impacts on line operation. The extent of such applications will be reflected by the ground-level field strengths as measured during operation. When estimated or measured for the line, such field strengths can be used by staff and other regulatory agencies for comparison with fields of lines of similar voltage and current-carrying capacity. Such 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 line in California is currently required to be designed according to the EMF-reducing guidelines of the utility in the service area involved, their fields are required under existing CPUC policies to be similar to fields from similar lines in that service area. A condition of certification is usually proposed by staff to ensure implementation of the reduction measures necessary. The applicable condition for this project is TLSN-1.

INDUSTRIAL STANDARDS

No federal regulations have been established 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 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 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 as the previously noted radio noise, audible noise and nuisance shocks. The present focus is on the magnetic field because only it can penetrate building 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 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 the power line environment.

SETTING

The route of the proposed line will traverse an undeveloped area as it extends southwards from the facility's switchyard, over the 1.38 miles to SCE's Pastoria Substation. It will parallel that of the existing SCE Pastoria-Magunden transmission in this area whose main features are described in more details by the applicant (PEF 1999a, pages 5.9-5 and 5.9.6). The route was chosen to provide the shortest route to the Pastoria Substation, thereby reducing the number of towers and the length of line needed for connection to the SCE system. No residential developments or communities are proposed near the route, meaning that the long-term residential magnetic field exposure of the present concern would be insignificant with regard to this line.

PROJECT DESCRIPTION

According to information from the applicant (PEF 1999a, pages 3.6-1 through 3.6-6, and 3.11-9 through 3.11-11), Pastoria's transmission line will be made up of the two components listed below.

- The double-circuit 230 kV overhead line extending 1.38 miles from the project site to the existing SCE Pastoria Substation.
- A new, 230 kV project-specific switchyard at the southern corner of the project site.

The line will be supported on steel lattice towers ranging in height from 100 feet to 120 feet. Each will be designed to provide a ground clearance of at least 30 feet. Details of these structures have been provided by the applicant. Construction and operation will be according to SCE standards and practices reflecting compliance with existing LORS.

IMPACTS

GENERAL IMPACTS

LORS section, GO-95 and Title 8, CCR Section 2700 et seq. provide the minimum regulatory requirements necessary to avoid the direct or indirect contact previously discussed in connection with hazardous shocks and aviation hazards. Of secondary concern are the field-related impacts manifesting 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 the field-reducing measures can affect line operations, the extent of their implementation together with related 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. The potential for all these impacts is assessed separately for each proposed project

PROJECT SPECIFIC IMPACTS

AVIATION SAFETY

The project is proposed for a location with no nearby airports. The nearest airport with regularly scheduled commercial flights is in Bakersfield, 35 miles away (PEF 1999b, pages 4-4 and 4.5). An FAA "Notice of Construction or Alteration" will not be required for the proposed power line, according to existing regulatory criteria. However, the applicant will (as is general practice with for all transmission lines) file this notice with the FAA. From its consideration of all issues related to distance from the line and FAA safety requirements, staff is in agreement with the applicant that the proposed line (which will run parallel to existing SCE lines) not pose a significant hazard to area aviation. The line's minimum ground clearance of 30 feet should be adequate for the safe operation of any aircraft involved in agricultural operations.

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 irregularities around the conductor surface. The applicant intends to use maintenance crews to minimize the potential for such corona impacts (PEF 1999a, pages 3.9-7, 3.9.8 and 4-6). The potential for such interference is usually of concern only for lines of 345 kV and above and not this 230 kV line. However, if such corona noise were to be generated, no interference-related complaints would be expected given the absence of residences in the project area. The previously noted provisions of the related FCC regulations are important in requiring each project owner to ensure mitigation of any such interference to the satisfaction of the affected individual. This requirement was noted by the applicant who intends to ensure compliance (Pastoria 1999a, page 4-6). Staff has proposed a condition of certification **(TLSN-2)** in this regard. **TLSN-1** is also proposed by staff to ensure compliance with GO-52, also intended to prevent radio interference.

AUDIBLE NOISE

As with radio noise, the line's low-corona design will minimize the potential for corona-related audible noise. This means, as noted by the applicant (PEF 1999a, page 4-6), that the line will not add significantly to existing background noise levels in the area. For an assessment of the noise from all phases of the proposed power plant and related facilities, please refer to staff's analysis in the **Noise** section.

FIRE HAZARDS

As is current SCE policy, adequate fire prevention and suppression measures will be implemented in the area around the proposed line as required by related regulations and industry practices. Compliance with G-O 95 requirements will ensure the clearance necessary to prevent fires from direct contact between the proposed line, trees and other objects. Staff has proposed a specific condition of certification, **TLSN-4,** to prevent accumulation of combustible materials that could contribute to such fires.

HAZARDOUS SHOCKS

As noted by the applicant (PEF 1999a, page 4-6), the proposed line will be constructed (as is present SCE practice) according to the requirements of GO-95 which prevent hazardous shocks from direct or indirect human contact with an overhead, energized line. Therefore, staff does not expect these lines to pose any such hazards to humans and recommends condition of certification **TLSN-1** to ensure implementation of the GO-95-related measures.

NUISANCE SHOCKS

As with current SCE practice, the potential for nuisance shocks will be minimized in the line area through standard grounding procedures. Ensuring GO-95-required ground clearance as intended will minimize the potential for the electrical charging for which such grounding would be necessary. Staff recommends condition for certification **TLSN-5** to ensure the grounding necessary.

ELECTRIC AND MAGNETIC FIELD EXPOSURE

The applicant calculated the maximum field strengths along the route of the proposed line, from the project's switchyard to the interconnection point on the SCE power grid. Calculations were made for the line design identified as ensuring the lowest fields possible without impacting safety, efficiency, reliability and maintainability. Results of this calculation (PEF 1999a, pages 3.6-4, 5.16-12 and 5.16-12, and Appendix P) show a maximum electric field strength of 0.75 kV/m at the edge of the right-of-way, 50 feet from the centerline. At 100 feet and 150 feet from the centerline, this field decreases to 0. 04 kV/m.

The maximum possible value for magnetic fields at the edge of the right-of-way, 50 feet from the centerline, is 40.96 mG. At 100 feet and 150 feet from this centerline, this field decreases to 11.76 mG and 9.85 mG, respectively. These field strengths are similar in intensity to those from similar SCE lines of similar voltage and current-carrying capacity. Staff has verified the accuracy of the applicant's calculations with regard to parameters bearing on field strength, dissipation, and exposure assessment. Staff has recommended condition of certification **TLSN-3** to verify that the fields are reduced to the extent proposed by the applicant since such field intensities reflect the appropriate application of the field-reducing measures involved.

CUMULATIVE IMPACTS

The strengths of electric and magnetic fields from the proposed and similar lines are usually calculated to factor the interactive effects of fields from nearby lines. Therefore, the values calculated for the proposed line reflect any cumulative exposure that could occur at any point along the route. As reflected in the calculated values, any such exposure would be similar to exposures associated with similar lines within the SCE transmission system.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Since electric or magnetic field health effects have neither been established nor ruled out for lines such as proposed for this project, the public health significance of any project-related field exposure cannot be characterized with certainty. The long-term, mostly residential magnetic exposure at the root of the present health concern will be insignificant for this line, limiting any health concerns. 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 practices which reflect compliance with GO-90 and Title 8, Section 2700 et seq. of the California Code of Regulations. Since the line will be located away from all area airports, any hazard to area aviation will be small. The use of low-corona line design together with an appropriate line maintenance program will minimize the potential for corona noise and its related interference with radio-frequency communication in the event of future residences in the line vicinity.

RECOMMENDATIONS

Since the proposed 230 kV transmission line will be designed according to the applicable safety and field-reducing guidelines, and routed as closely as possible to existing area transmission lines, staff recommends approval with specific regard to the line-related impacts of concern in this analysis. If such approval is granted, staff recommends that the Commission adopt the following conditions of certification to ensure implementation of the measures necessary to achieve the field levels assumed by the applicant for the line design.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the proposed transmission line according to the requirements of CPUC's GO-95, GO-52, Title 8, Section 2700 et seq. of the California Code of Regulations and PG&E's EMF-reduction guidelines arising from CPUC Decision 93-11-013.

Verification: Thirty days before starting construction of the transmission line or related structures and facilities, the project owner shall submit to the Commission's Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the line will be constructed according to the requirements GO-95, GO 52, Title 8, Section 2700 et seq. of the California Code of Regulations and PG&E's EMF-reduction guidelines arising from CPUC Decision 93-11-013.

TLSN-2 The project owner shall ensure that every reasonable effort will be made to identify and correct, on a case-specific basis, any complaints of interference with radio or television signals from operation of the project-related lines and associated switchyards.

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

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

TLSN-3 The project owner shall engage a qualified consultant to measure the strengths of the line electric and magnetic fields from the line before and after they are energized. Measurements should be made at representative points along the edge of the right-of-way for which field strength estimates were provided.

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

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

Verification: During the first five years of plant operation, the project owner shall provide a summary of inspection results and any fire prevention activities carried out along the right-of-way and provide such summaries in the Annual Compliance Report.

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

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

Verification: At least 30 days before the line is energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

REFERENCES

PEF (Pastoria Energy Facility) 1999a. Application for Certification, Volumes I and II, Pastoria Energy Facility Project (AFC-99-7). Submitted to the California Energy Commission on November 30, 1999.

Electric Power Research Institute (EPRI) 1982. Transmission Line Reference Book: 345 kV and Above

Energy Commission Staff 1992. High Voltage Transmission Lines: Summary of Health Effects Studies. California Energy Commission Publication, P700-92-002

National Institute of Environmental Health Services 1998. An Assessment of the Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields. A Working Group Report, August, 1998.

HAZARDOUS MATERIALS MANAGEMENT

Rick Tyler

INTRODUCTION

The purpose of this analysis is to determine if the proposed Pastoria Energy Facility (PEF) (1999a) will result in the potential for a 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, in exchange for compensation, accept a higher level of risk than would be acceptable for general public exposure. Workers are therefore 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 (see staff's **Worker Safety and Fire Protection chapter**).

The only process associated with the PEF that requires use of reportable quantities of a hazardous material is the Selective Catalytic Reduction (SCR) process that may be required to control NO_x emissions. The PEF project includes two options for controlling NO_x emissions. These include 1) use of the XONON process and 2) the use of SCR. If the XONON process is used the project will not involve the use of any acutely hazardous materials in reportable quantities. If SCR is used aqueous would be used at the PEF in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j). Even if SCR is used, the choice of aqueous ammonia significantly reduces the risk that would be associated with use of the more hazardous 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, where it can be transported in the atmosphere and result in high down-wind concentrations. Spills associated with the aqueous form are also much easier to contain than those associated with the anhydrous form. In addition, relatively slow mass transfer from the free surface of the spilled aqueous solution limits emissions from a spill of aqueous ammonia. Analysis of the potential for impact associated with aqueous ammonia deliveries is addressed in staff's **Traffic and Transportation chapter**.

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. However, these materials pose little or no significant potential for off-site impacts as a result of the quantities on site, their relatively low toxicity,

and/or their low environmental mobility. Although no natural gas is stored, the project will also involve the construction and operation of short natural gas pipeline connections and handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion.

LAWS, ORDINANCES, REGULATIONS, STANDARDS AND POLICIES

The following federal, state, and local laws and policies generally 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 (SARA) Title III and Clean Air Act of 1990 established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The Act (codified in 40 C. F. R., § 68.110 et seq.) 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 these Acts are reflected in the California Health and Safety Code, section 25531 et seq.

STATE

The California Health and Safety Code, section 25534, directs facility owners, storing or handling acutely hazardous materials in reportable quantities, to develop a Risk Management Plan (RMP) and submit it to appropriate local authorities, the United States Environmental Protection Agency (EPA), and the designated local Administering Agency for review and approval. The plan must include an evaluation of the potential impacts associated with an accidental release, the likelihood of an accidental release occurring, the magnitude of potential human exposure, any preexisting evaluations or studies of the material, the likelihood of the substance being handled in the manner indicated, and the accident history of the material. This new, recently developed program supersedes the California Risk Management and Prevention Plan (RMPP).

Title 8, 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 – 515, set forth requirements for design, construction and operation of vessels and equipment used to store and transfer anhydrous 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. While these codes apply to anhydrous ammonia, they may also be 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."

LOCAL AND REGIONAL

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials. These provisions are contained in Articles 79 and 80. The latest revision to Article 80 was in 1997 (UFC, 1997). These articles contain minimum setback requirements for outdoor storage of ammonia.

The California Building Code contains requirements regarding the storage and handling of hazardous materials. The Chief Building Official must inspect and verify compliance with these requirements prior to issuance of an occupancy permit. A further discussion of these requirements is provided in the **Facility Design chapter** of this document.

SETTING

SITE AND VICINITY DESCRIPTION

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:

The local meteorology,

Terrain characteristics, and

The location of population centers and sensitive receptors relative to the project.

Staff considered these factors, as discussed below, in assessing the potential public health impacts of 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 level of public exposure to such materials and the associated health risks. When wind speeds are low and 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 of the AFC (URS Greiner Woodward Clyde, 1999a, AFC Chapter 5.2). This data indicates that wind speeds below one meter per second and temperatures exceeding 100°F can occur in the project area. Therefore, staff suggests that the applicants use F stability (stagnated air, very little mixing), one meter/second wind

speed and an ambient temperature of 100° F in its modeling analysis of an accidental release to reflect worst case atmospheric conditions. These conditions were reflected in the modeling used to estimate the potential worst case impacts associated with an accidental ammonia release with the exception of one meter per second wind speed. A wind speed of 1.5 meters per second was used for the PEF analysis. This appears reasonable based on site specific data provided in the AFC.

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 principal risk of accidental release at this facility is associated with aqueous ammonia. However, modeling of an accidental release of aqueous ammonia indicates that significant concentrations would be confined to the facility property. Thus, elevated terrain is not an important factor affecting the modeled results.

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 (Calabrese 1978). Also, the location of the population in the area surrounding a project site may have a large bearing on health risk. The PEF is located in a sparsely populated area of Kern County. There are no sensitive land uses within a 1 mile radius of the proposed facility (1999a).

IMPACTS

The Energy Commission staff has determined that aqueous ammonia and natural gas are the only hazardous materials to be handled that pose a risk of off-site impacts. The following is a project specific analysis of the potential impacts associated with the handling of each of these materials.

AQUEOUS AMMONIA

Aqueous ammonia may be used in controlling the emission of oxides of nitrogen (NOx) from the combustion of natural gas in the facility. The accidental release of aqueous ammonia without proper mitigation can result in hazardous down-wind concentrations of ammonia gas.

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 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 exposure associated with a potential release would exceed 75 ppm at any public receptor, staff will presume that the potential release poses a risk of significant impact. However, staff may also assess the probability of occurrence of the release and/or the nature of the potentially exposed population. Staff may, based on such analysis, determine that the likelihood and extent of potential exposure are not sufficient to support a finding of potentially significant impact.

Section 5.15 of the AFC included a discussion of the results of modeling for a worst case accidental release of aqueous ammonia. Because the storage tank is double walled the worst-case release scenario is associated with a postulated total release of a delivery vehicle. In conducting this analysis, it was assumed that spilled material would be contained in the covered basin below the storage vessel and that winds of 1.5 meters per second and category F stability would exist at the time of the accidental release. This screening analysis was designed to predict the maximum possible impacts based on distance from the storage tank without regard to specific direction of transport. Staff evaluated the model used, the assumptions leading to model inputs, and the results of the modeling. Based on this staff concurs with the approach and the results. This analysis indicated that concentrations exceeding 75 PPM would be confined almost completely to the project site and would not affect any public receptor.

NATURAL GAS

Natural gas, which will be used as a fuel by the project, poses a fire and/or explosion risk as a result of its flammability. While natural gas will be used in significant quantities, it will not be stored on-site. The risk of a fire and/or explosion from natural gas can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. The National Fire Protection Association (NFPA) Code 85A requires: 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.

CUMULATIVE IMPACTS

As proposed, the facility will cause no significant risk of off-site impacts. Thus the direct impacts of the project will not add to any existing accidental release risks, so no cumulative impacts are possible.

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, Kern 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 (O.E.S. 1990).

MITIGATION

Staff has determined that the proposed mitigation for the PEF is adequate to reduce the potential risk of public health impacts associated with accidental release of hazardous materials to insignificant levels. However, staff proposes a condition (Haz-3) requiring development of a safety management plan for delivery of aqueous ammonia, since the PEF is not required to develop and implement a Process Safety Plan pursuant to Title 8. If aqueous ammonia is used 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 associated with the project. The other proposed conditions ensure that the facility will use only those materials proposed in the AFC and that the project will comply with applicable LORS.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSION

Staff's evaluation of the proposed project (with staff's proposed mitigation measures) indicates that hazardous materials use will pose no 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 may be required to develop an RMP.[1] If ammonia use were necessitated by the need to use SCR rather than use of the XONON process an RMP would be required by the Kern County Environmental Health Department. If required an RMP is required it will be submitted to EPA, the Kern County Environmental Health Department, and Energy Commission staff for evaluation prior to ammonia use at the PEF. To insure adequacy of the RMP, staff proposes a condition of certification requiring that the RMP, if required, be submitted for concurrent review by EPA, the Kern County Environmental Health Department, and staff. In addition, staff's proposes a condition of certification that also requires Kern County's acceptance of the RMP and staff's approval of the RMP prior to delivery of any hazardous materials to the facility. With adoption of staff's proposed conditions of certification, the project will also comply with Health and Safety Code, section 41700, and it will not pose any potential for significant impacts to the public from hazardous materials releases.

[1] At present, it appears unlikely that an RMP will be required.

RECOMMENDATION

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 material in reportable quantities, as specified in Title 40, C. F.R. Part 355, Subpart J, section 355.50, not listed in Appendix B, below, or in greater quantities than those identified by chemical name in Appendix B, below, unless approved in advance by the CPM.

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

HAZ-2 If required, the project owner shall provide a Risk Management Plan to the Kern County Environmental Health Department and the CPM for review at the time the plans are first submitted to the U.S. Environmental Protection Agency (EPA). The project owner shall reflect all recommendations of the Kern County Environmental Health Department and the CPM in the final document. A copy of the final plans, reflecting all comments, shall be provided to Kern County and the CPM once deemed complete by EPA.

Verification: At least sixty (60) days prior to the delivery of aqueous ammonia to the MLPP project the owner shall provide the final plans, listed above and accepted by Kern County, to the CPM for approval.

HAZ-3 The project owner shall develop and implement a safety management plan for delivery of ammonia. The plan shall include procedures, protective equipment requirements, training and a checklist.

Verification: At least sixty 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 tanks shall be constructed to specifications at least as protective as those in American Petroleum Institute (API) 620. The secondary containment will be designed and operated to hold the volume of precipitation from a 24-hour, 25-year storm event plus 100 percent of the capacity of the largest tank within its boundary.

Verification: At least 60 days prior to delivery of aqueous ammonia to the site, the project owner shall submit final design drawings and specifications for the ammonia storage tank and secondary containment basins to the CPM for review and approval.

REFERENCES

AIChE (American Institute of Chemical Engineers). 1989. Guidelines For Technical Management of Chemical Process Safety, AIChE, New York, NY 10017.

AIChE (American Institute of Chemical Engineers). 1994. Guidelines For Implementing Process Safety Management Systems, AIChE, New York, NY 10017.

API (American Petroleum Institute). 1990. Management of Process Hazards, API Recommended Practice 750; American Petroleum Institute, First Edition, Washington, DC, 1990.

Baumeister, T. and L.E. Marks. 1967. Standard Handbook for Mechanical Engineers; McGraw-Hill, New York, NY. (Tables 24 and 43).

Calabrese, E.J. 1978. Pollutants and High Risk Groups. John Wiley and Sons, New York.

EPA (Environmental Protection Agency). 1987. Technical Guidance for Hazards Analysis, Environmental Protection Agency, Washington, DC, 1987.

EPA (Environmental Protection Agency). 1988. Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Environmental Protection Agency, Research Triangle Park, NC, 1988.

FEMA (Federal Emergency Management Agency). 1989. Handbook of Chemical Hazard Analysis Procedures, Federal Emergency Management Agency, Washington, DC, 1989.

Lees, F.P. 1998). Loss Prevention in the Process Industries, Vols. I, II and III. Second Edition, Butterworths.

NFPA (National Fire Protection Association). 1987. NFPA 85A, Prevention of Furnace Explosions in Fuel Oil and Natural Gas Fired Single Burner Boiler Furnaces, National Fire Protection Association, Batterymarch Park, Quincy, MA, 1987.

NRC (National Research Council). 1979. Ammonia. Subcommittee on Ammonia. Committee on Medical and Biologic Effects of Environmental Pollutants. Division of Medical Sciences, Assembly of Life Sciences, National Research Council (NRC), Baltimore, Maryland, University Park Press (NTIS No. PB 278-027).

PEF (Pastoria Energy Facility) 1999a. Application for Certification, Volume I and II, Pastoria Energy Facility Project (AFC-99-7). Submitted to the California Energy Commission on November 30, 1999.

Perry. 1973. Perry's Chemical Engineers' Handbook, Sixth Edition, McGraw-Hill, USA.

USOSHA (United States Occupational Safety and Health Administration). 1993. Process Safety Management / Process Safety Management Guidelines For Compliance. U.S. Department of Labor, Washington, DC.

BASIS FOR STAFF'S USE OF 75 PPM AMMONIA EXPOSURE CRITERIA

Staff uses a criterion of 75 ppm to evaluate the significance of impacts associated with potential accidental releases of ammonia. While this criterion is not consistent with the 200 ppm criterion 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 are implemented and actions are taken 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. 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 Limits (STPELs) to determine the potential for significant impact. These limits are designed to apply to accidental unanticipated releases and subsequent public exposure. Exposure at these levels should not result in "serious sequelae" 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 of the general public 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.

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 protect 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

EPA, 1987, U.S. Environmental Protection Agency, Technical Guidance for Hazards Analysis, EPA, Washington, D.C.

NRC, 1985, National Research Council, Criteria and Methods for Preparing Emergency Exposure Guidance Levels (EEGL), Short-Term Public Emergency Guidance Level (SPEGL), and Continuous Exposure Guidance Level (CEGL) Documents, NRC, Washington, D.C.

NRC, 1972, Guideline for Short-Term Exposure of The Public To Air Pollutants. IV. Guide for Ammonia, NRC, Washington, D.C.

AIHA, 1989, American Industrial Hygienists Association, Emergency Response Planning Guideline , Ammonia, (and Preface) AIHA, Akron, OH.

NIOSH, 1994, National Institute of Occupational Safety and Health, Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, Washington D.C., Publication number 94-116.

WHO, 1986, World health Organization, Environmental Health Criteria 54, Ammonia, WHO, Geneva, Switzerland.

ABBREVIATIONS

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

HAZARDOUS MATERIAL MANAGEMENT
Appendix B

[Insert here Table 3.4.10-1-2 from Pastoria Energy Facility AFC)

WASTE MANAGEMENT

Michael Ringer

INTRODUCTION

This analysis presents an assessment of issues associated with managing wastes generated from constructing and operating the proposed Pastoria Energy Facility (PEF). It evaluates 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 project wastewaters, such as those discharged to injection wells. 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 constructing and operating the proposed project will be managed in an environmentally safe manner; and
- 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 - RCRA (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 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 §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, §17200 ET SEQ. (MINIMUM STANDARDS FOR SOLID WASTE HANDLING AND DISPOSAL)

These regulations set forth minimum standards for solid waste handling and disposal, guidelines to ensure conformance of solid waste facilities with county solid waste management plans, as well as enforcement and administration provisions.

TITLE 22, CALIFORNIA CODE OF REGULATIONS, §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.

LOCAL

KERN COUNTY GENERAL PLAN PUBLIC FACILITIES ELEMENT

All generators and processors of hazardous waste are encouraged to develop long-term waste management programs. Large generators of hazardous waste should be encouraged to recycle, treat and detoxify their wastes on site. Many such processes could be implemented in existing industrial map designations, if zoned appropriately (Policy No. 17).

SETTING

PROJECT AND SITE DESCRIPTION

The proposed project is a nominal 750 megawatt natural gas fired combined cycle generating facility consisting of three gas turbine generators with associated heat recovery steam generators and two steam turbine generators. The proposed

location is on an undeveloped site within Tejon Ranch, adjacent to an existing gravel quarry, approximately 30 miles south of Bakersfield at the base of the Tehachapi Mountains.

PEF, LLC retained URS Greiner Woodward Clyde to conduct a Phase I Environmental Site Assessment (ESA) for the proposed project in April, 1999 (PEF/Ray 1999d). The purpose of the ESA was 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 ESA was performed for the power plant site and construction lay-down area, and along the proposed water, wastewater, electrical transmission, and natural gas pipeline linear alignments.

The Phase I ESA included the following tasks:

- Site reconnaissance – staff experienced in hazardous materials and waste surveys observed surface conditions and current activities at the site and adjoining properties. A limited inventory of potential contaminant sources in and adjoining the study areas was completed on the basis of visual observations and interviews with PEF, LLC and Tejon Ranch personnel.
- Records review – state, federal, and Kern County agency database listings were researched to assess the potential presence of hazardous substance contamination at the proposed site and along linear facilities. Databases included: Federal Emergency Response Notification System; Toxic Release Information System; registered underground storage tanks; RCRA generators and treatment, storage, and disposal facilities; leaking underground storage tanks; landfills and solid waste disposal sites; and state and federal superfund sites.
- Supplemental records review and interviews – included the assessment of local and regional geologic and hydrologic conditions.
- Site history – including historic aerial photographs, U.S. Geological Survey topographic maps, and California Department of Oil and Gas maps.

Based on the site reconnaissance and review of available records, the Phase I concluded:

- The project area has been primarily undeveloped with the exception of unpaved roads and oil field associated improvements such as wells, sumps, pipelines, and aboveground storage tanks.
- Oil field wells and pumps are adjacent to the proposed natural gas pipeline route.
- Three 55-gallon drums apparently associated with the Griffith Company asphalt product plant were observed near the northeastern boundary of the power plant site and construction lay-down area. Approximately forty 55-gallon drums and scrap metal were observed along the eastern margin of the rock quarry, about one-quarter mile east of the power plant site. Oil-like residue was observed on the drums. It is not known whether the current operations and waste-handling

practices at the Griffith Company have resulted in environmental impacts to the proposed site.

- Aboveground storage tanks, oil well, and pumps are located near some of the proposed linear facilities. Surface soil staining was noted near some of the oil field improvements, and it would be reasonable to suspect oil contamination in the upper ten feet of soil or deeper where surface staining was noted.
- Five pole-mounted transformers were noted along Sebastian and Rancho Roads, within the natural gas pipeline proposed Route 3.
- A trailer-mounted aboveground storage tank for fertilizer/fungicide was observed within the natural gas pipeline Route 3, near an agricultural field along the northern side of Sebastian Road. It is not known whether the fertilizer/fungicide is used within the proposed alignment.
- As of April 1, 1999, the agency records reviewed do not indicate use or storage of hazardous material or wastes, or the release of hazardous materials or wastes within the power plant site.

Based on findings from the Phase I ESA, URS recommended that a Phase II ESA be conducted to investigate areas where potential environmental concerns were observed. Specifically, URS recommended:

- Soil sampling along the eastern perimeter of the power plant site, near the rock quarry and asphalt plant, where waste-containing drums were observed.
- Soil sampling at the terminus of the proposed wastewater discharge line, within the Tejon oil field, where four Aquanox-containing aboveground storage tanks were observed.
- Soil sampling along the natural gas pipeline routes 3, 3A, and 3B, where aboveground storage tanks associated with a field maintenance yard were observed, and where stained soil and standing oil were observed within the Tejon Hills and Comanche oil fields.
- Soil sampling adjacent to the fungicide and fertilizer-containing aboveground storage tanks within Sebastian Road right-of-way along the natural gas pipeline Route 3.

Following completion of the Phase I ESA, several components of the proposed project were modified or deleted. These include elimination of the wastewater discharge line (Route 4) from the PEF site to its terminus within the Tejon Oil Field, elimination of the proposed alternative fuel gas pipeline Routes 3A and 3B, and modification of the location and/or orientation of the PEF site, construction laydown area, 230 kV transmission line, and access road. These changes affect the applicability of the Phase I ESA recommendations as follows (Scholl 2000a, pp. 43-46):

- Due to refinements in location and orientation of the proposed site and the fuel gas supply pipeline (Route 3), three of the identified drums are approximately

500 feet south of the proposed pipeline route and the others are a minimum of 1,500 feet from the site. Due to the distance of the drums from the site and the depth to groundwater (greater than 100 feet), the potential impact of the drum contents on soil and groundwater beneath the proposed site is low. Thus, soil sampling is no longer necessary.

- The proposed wastewater discharge line (study area B in the ESA) was deleted from the project scope in February 2000, so characterizing the soil within the Tejon oil field at the line terminus is no longer applicable.
- The recommendation to conduct soil sampling within the Comanche Oil Field is no longer applicable since alternative fuel gas pipeline Routes 3A and 3B have been deleted. The remainder of the recommendation is applicable because the proposed gas supply pipeline (Route 3) still traverses the Tejon Hills Oil Field and is designed to run near the farm maintenance yard, although exact routing has not yet been determined.
- The fuel gas supply pipeline is currently designed to traverse east-west along the Sebastian Road easements, although the exact routing and the pipeline's proximity to the identified aboveground storage tanks has not yet been determined. If detailed engineering design indicates that the pipeline will be located within the northern right of way of Sebastian Road, a soil sampling program would still be applicable.

IMPACTS

PROJECT- SPECIFIC IMPACTS

CONSTRUCTION

Site preparation, along with construction of the generating plant and associated facilities, will generate a variety of nonhazardous and hazardous wastes. The construction contractor will be responsible for all construction-related wastes and their management. Typical management practices required for construction wastes include recycling, proper storage, and weekly pickup and disposal (PEF 1999a, AFC p. 3.4-21).

Nonhazardous waste streams from construction may include paper, wood, glass, scrap metal, and plastics, from packing materials, waste lumber, insulation, and nonhazardous chemical containers. During construction of the generating plant and associated linear facilities, PEF estimates that up to one thousand tons of nonhazardous solid waste may be generated, at the rate of about 40 cubic yards per week (PEF 1999a, AFC p. 5.14-4 and Table 3.4.9-1). These wastes will be recycled, where practical, with the remainder removed on a regular basis by a certified waste handling contractor for disposal at a Class III (nonhazardous) landfill. Waste metal generated during construction will include steel from welding and cutting operations, packing materials, and empty chemical containers; aluminum wastes from packing materials; and electrical wiring waste. Metals which cannot be

salvaged or recycled will be disposed of at a Class III landfill (PEF 1999a, AFC p. 5.14-4).

Hazardous wastes typically generated during construction include waste oil and grease, paint, used batteries, spent solvent, welding materials, chemical cleaning solutions from heat recovery steam generator and pipe cleaning, and cleanup materials from spills of hazardous substances. AFC Table 3.4.9-1 lists hazardous waste streams from construction, their estimated amounts, and management methods. PEF estimates that about 165 gallons of used solvents, oil, and paint will be generated every 90 days. PEF also expects about one cubic yard per week of empty hazardous material containers will be generated, although these may be classified as nonhazardous if they are emptied and managed according to specified methods (22CCR§66261.7).

In addition to wastes from project construction, hazardous wastes may be generated during site preparation. As noted above, the Phase I ESA identified areas near proposed linear alignments where petroleum impacted soil from oil-field operations may be present in surface and subsurface soil. Additionally, herbicides, pesticides, and defoliants have historically been used in the area for agricultural purposes, and may have resulted in some contamination. Depending on the extent of contamination present, additional hazardous wastes may require transportation offsite to a permitted facility.

OPERATION

Under normal operating conditions, the proposed facility will generate both nonhazardous and hazardous wastes.

Nonhazardous wastes generated during plant operation include trash, office wastes, empty containers, broken or used parts, used packing material, used filters, suspended solids from make-up water treatment, and, potentially, cooling tower basin sludge and salt cake from wastewater treatment. AFC Table 3.4.9-2 lists the nonhazardous wastes expected to be generated during facility operation, their estimated amounts, and management methods. Nonhazardous solid waste will be recycled to the extent practical and the remainder transported by a certified hauler to a Class III landfill (PEF 1999a, AFC p. 5.14-5).

Suspended solids from the raw water treatment system will comprise a filter cake that will be produced at the rate of about two to three cubic yards daily. That waste will be recycled as soil amendment or sent to a nonhazardous disposal facility. Cooling tower basin sludge will be generated at the rate of about two tons annually, and will be similarly disposed if testing confirms that it is nonhazardous. Staff will propose a condition of certification (WASTE-5) requiring initial testing of cooling tower sludge to determine if it can properly be managed as nonhazardous.

The PEF project proposes to use a wastewater management system incorporating treatment resulting in zero discharge of liquid wastes (PEF 2000a, Attachment 11). The discharge system will concentrate the dissolved and suspended constituents in the wastewaters through a combination of evaporation and crystallization, resulting

in a solid salt cake. The effluent water from the treatment process would be reclaimed and reused at PEF as makeup for the heat recovery steam generator, inlet evaporative cooler, and cooling tower.

In the proposed treatment system, the cooling tower blowdown, demineralizer regeneration backwash, and oil-water separator clear well discharge would be directed to a holding tank. These combined wastewaters would then flow to an evaporator-condenser (also known as a brine concentrator) that would use heat and/or vacuum and compression to recover about 98 percent of the wastewater as high quality condensate. A highly concentrated brine product would be discharged from the brine concentrator to a storage tank and then to a brine crystallizer. Product salt cake with a moisture content of about ten to fifteen percent would be discharged at an average rate of about five cubic yards per day, up to a maximum of eight cubic yards daily.

Naturally-occurring substances such as trace heavy metals present in the surface waters used for cooling would become concentrated in the salt cake product. PEF, LLC estimated the concentrations of hazardous constituents to determine if the salt cake or intermediate process wastewaters would be considered hazardous (Thompson 2000f, data response 44, revised Tables 44-1 through 44-3). Revised Table 44-2 shows that chromium and selenium in effluent from the brine concentrator may approach regulatory levels for hazardous wastes. That effluent is subsequently routed to the crystallizer for further concentration. If the effluent were to contain hazardous levels of any constituent, such concentration could be considered hazardous waste treatment, a process which would require a permit from the Department of Toxic Substances Control. However, since the effluent water is reused in the plant, a recycling exemption provided for in Health and Safety Code section 25132.2(c)(2) would apply as long as the following conditions are met:

- The wastewater must be recycled at the same facility at which it was generated.
- The wastewater must be recycled within generator waste accumulation time limits.
- The wastewater must be managed in accordance with all applicable requirements for generators of hazardous wastes under Health and Safety Code Chapter 6.5 and regulations adopted by DTSC.

Revised Table 44-3 (Thompson 2000f, data response 44) lists the estimated maximum concentration of hazardous metals in the final salt product. These are projected to be below levels that would result in a hazardous classification. However, staff proposes Condition of Certification Waste-6 which would require testing of the salt cake to ensure that it can properly be managed as nonhazardous.

Routine project operation will generate a variety of hazardous wastes which, along with amounts estimated to be generated and planned management methods, are summarized in AFC Table 3.4.9-2. Hazardous operation wastes include spent air pollution control catalysts, used oil and filters, used cleaning solvents, used

batteries, and used oil absorbent. About 1800 gallons of used oil will be generated annually along with hydraulic fluids, grease, and filters (PEF 1999a, AFC p. 5.14-8). These will be collected for recycling by a licensed waste oil recycler. Every three to four years, air pollution control catalysts must be replaced in order to maintain their control efficiency. About 16,000 cubic feet of spent catalyst will be returned to the manufacturer or metals reclamation or disposal. In addition, periodic turbine cleaning will generate contaminated wash water. These cleaning solutions are usually collected and disposed of offsite by the licensed contractor who conducts the cleaning.

IMPACT ON EXISTING WASTE DISPOSAL FACILITIES

AFC Table 5.14-1 lists landfills in Kern County which accept nonhazardous wastes. The two landfills closest to the site (Arvin and Bena) also have the shortest remaining operating lifetimes. However, the remaining three are expected to remain operational up to 50 more years. The volume of nonhazardous waste expected from construction and operation of the Pastoria project is expected to be a fraction of one percent of their combined annual capacity. Thus, even discounting the effects of recycling on the total amount of non-hazardous wastes destined for landfilling, the amounts of waste generated during project construction and operation are insignificant relative to existing disposal capacity.

Three Class I landfills in California, at Kettleman Hills in King's County, Buttonwillow in Kern County, and Westmoreland in Imperial County, are permitted to accept hazardous waste. In total, there is in excess of twenty million cubic yards of remaining hazardous waste disposal capacity at these landfills, with remaining operating lifetimes in excess of 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.

Much of the hazardous waste generated during facility construction and operation will be recycled, such as used oil and spent catalysts. Even without recycling, the generation of hazardous waste from PEF would be a very small fraction (less than one percent) of existing capacity and not significantly impact the capacity or remaining life of any of the state's Class I landfills.

CUMULATIVE IMPACTS

Additional hazardous and nonhazardous wastes from constructing and operating the Sunrise and Elk Hills projects would add to those generated from the PEF project. The types and quantities of wastes from all three projects will be similar, and most of them will be recycled. Thus, the combined amount of wastes would still be on the order of one percent or less of available landfill capacity, resulting in insignificant disposal facility impacts.

FACILITY CLOSURE

During any type of facility closure (see staff's General Conditions section which discusses planned, unexpected temporary, and unexpected permanent closure), one 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 likely be adequate to avoid significant problems. In addition, staff's General Conditions for Facility Closure require preparation of an on-site contingency plan which shall 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. 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, PEF will develop a facility closure plan at least twelve months prior to commencement of closure which will detail compliance with LORS applicable at the time of closure (PEF 1999a, AFC p. 3.10-1).

COMPLIANCE WITH APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Energy Commission staff concludes that PEF will be able to comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during facility construction and operation. The applicant is required to dispose of hazardous and non-hazardous wastes at facilities approved by the Regional Water Quality Control Board or the CAL EPA - Department of Toxic Substances Control. Because hazardous wastes will be produced during project construction and operation, PEF must acquire and maintain an EPA identification number as a hazardous waste generator. Accordingly, PEF will be required to properly store, package and label waste, use only approved transporters, prepare hazardous waste manifests, and keep detailed records. Pursuant to California Code of Regulations, title 22, section 67100.1 et seq., a hazardous waste source reduction and management review may be required, depending on the amounts of hazardous waste ultimately generated.

MITIGATION

PEF intends to implement the following mitigation measures during construction and operation of the proposed project (PEF 1999a, AFC p. 5.14-9):

- Detailed waste management plans will be prepared for all waste generated during project construction and operation.
- Procedures to minimize hazardous waste generation will be established, and nonhazardous materials will be used in lieu of hazardous materials whenever possible.
- Hazardous wastes will be recycled whenever possible.

Staff has examined the waste management related measures proposed by PEF and concludes that, together with applicable LORS and the additional measure proposed by staff, they will adequately assure that no significant environmental impacts will result from the management and disposal of project-related waste.

CONCLUSIONS AND RECOMMENDATIONS

Management of the wastes generated during construction and operation of PEF will not result in any significant adverse impacts if the waste management measures proposed in the Application for Certification (99-AFC-7), the additional measure proposed by staff below, and the proposed conditions of certification are implemented.

Staff recommends that if potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities, as evidenced by discoloration, odor, or other signs, PEF have an environmental professional (as defined by American Society for Testing and Materials practice E 1527-97 Standard Practice for Phase I environmental Site Assessments) determine the need for sampling to confirm the nature and extent of contamination. If significant remediation may be required, PEF must also contact representatives of the Kern County Environmental Health Services Department and the Sacramento Field Office of the California Department of Toxic Substances Control for possible oversight.

CONDITIONS OF CERTIFICATION

WASTE-1 The project owner shall obtain a hazardous waste generator identification number from the Department of Toxic Substances Control prior to generating any hazardous waste.

Verification: The project owner shall keep its copy of the identification number on file at the project site and notify the CPM via the monthly compliance report of its receipt.

WASTE-2 Upon becoming aware of any impending waste management-related enforcement action, the project owner shall notify the CPM of any such action taken or proposed to be taken against it, or against any waste hauler or disposal facility or treatment operator that the owner contracts with.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action.

WASTE-3 Prior to the start of both construction and operation, the project owner shall prepare and submit to the CPM, for review and comment, a waste management plan for all wastes generated during construction and operation of the facility, respectively. The plans shall contain, at a minimum, the following:

- A description of all expected waste streams, including projections of frequency and hazard classifications; and
- Methods of managing each waste, including treatment methods and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

Verification: No less than 60 days prior to the start of rough grading, the project owner shall submit the construction waste management plan to the CPM for review. The operation waste management plan shall be submitted no less than 60 days prior to the start of project operation. The project owner shall submit any required revisions within 30 days of notification by the CPM (or mutually agreed upon date). In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to planned management methods.

WASTE-4 The project owner shall have an environmental professional (as defined by American Society for Testing and Materials practice E 1527-97 Standard Practice for Phase I environmental Site Assessments) available for consultation during soil excavation activities. If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, or other signs, prior to any further construction activity at that location, the environmental professional shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner stating the recommended course of action. If, in the opinion of the environmental professional, significant remediation may be required, the project owner shall contact representatives of the Kern County Environmental Health Services

Department and the Sacramento regional office of the California Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall notify the CPM in writing within 5 days of any reports filed by the environmental professional, and indicate if any substantive issues have been raised.

WASTE-5 The project owner shall test cooling tower sludge for the presence of hazardous levels of metals. The sludge shall be managed appropriately according to the test results.

Verification: The project owner shall notify the CPM via the annual compliance report of the cooling tower sludge test results.

WASTE-6 The project owner shall test the final salt cake product from the crystallizer for the presence of hazardous levels of metals. If the test shows all levels to be below ten times the Soluble Threshold Level Concentration as listed in Title 22, California Code of Regulations, section 66261.24, then future testing is not required unless there is a substantial change in the wastewater treatment process. The salt cake shall be managed appropriately according to the test results.

Verification: The project owner shall notify the CPM via the annual compliance report of the test results.

WASTE-7 As soon as practical after exact routing of the natural gas supply pipeline is determined, the project owner shall submit a soil sampling plan to the CPM for review and approval. The plan shall address the applicable portions of the Phase I ESA recommendations to conduct sampling along the natural gas pipeline routes where stained soil and standing oil were observed within the Tejon Hills oil field and within the northern right of way of Sebastian Road adjacent to the fungicide and fertilizer-containing aboveground storage tanks.

VERIFICATION: No less than 60 days prior to the start of natural gas supply pipeline construction, the project owner shall submit the sampling plan to the CPM for review and approval.

REFERENCES

PEF (Pastoria Energy Facility) 1999a. Application for Certification, Volumes I and II, Pastoria Energy Facility Project (AFC-99-7). Submitted to the California Energy Commission on November 30, 1999.

PEF (Pastoria Energy Facility/Ray) 1999d. Transmittal of Phase I Environmental Site Assessment. Prepared for the PEF Application for Certification (AFC-99-7). Submitted to the California Energy Commission on December 16, 1999.

PEF (Pastoria Energy Facility) 2000a. Response to CEC Data Adequacy Comments; dated December 29, 1999 (Supplement to AFC-99-7). Submitted to the California Energy Commission on January 5, 2000.

PEF (Pastoria Energy Facility /Scholl) 2000a. Response to Data Requests 2000 (First Data Response submittal). Submitted to the California Energy Commission on March 13, 2000.

PEF (Pastoria Energy Facility/Thompson) 2000f. Applicant's Data Request Responses (Third Data Response Submittal). Submitted to the California Energy Commission on April 3, 2000.

LAND USE

Amanda Stennick

INTRODUCTION

The land use analysis of the Pastoria Energy Facility (PEF) 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. Indirect land use impacts such as noise, traffic, visual resources, air quality, biology, transmission line safety and nuisance, or public health are discussed in those specific areas of this staff assessment.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

KERN COUNTY GENERAL PLAN

The general plan is the legal document that acts as a constitution for land use and development in Kern County. It consists of the seven mandatory elements: land use, circulation, open space, conservation, housing, safety and seismic safety, and noise; and four optional elements: recreation, energy, hazardous waste management, and public services and facilities (Kern County 1994). The following land use designations of the Kern County General Plan are specific to the proposed project.

GENERAL PLAN LAND USE DESIGNATIONS

NONJURISDICTIONAL LAND

State and Federal Land - All property under the ownership and control of various state and federal agencies.

RESOURCE

Intensive Agriculture

Applies to areas devoted to the production of irrigated crops or having the potential for such use. Other agricultural uses may be consistent with the intensive agriculture designation. Minimum parcel size is 20 acres gross. Permitted uses include, but are not limited to:

- Primary: irrigated cropland, orchards, vineyards, ranch and farm facilities, etc.; one single-family dwelling unit.
- Compatible: livestock grazing, water storage, mineral and petroleum exploration and extraction, and public utility uses, etc., pursuant to provisions of the Zoning Ordinance.

Extensive Agriculture

Applies to agricultural uses involving large amounts of land with relatively low value-per-acre yields. Minimum parcel size is 20 acres gross, except lands not under Williamson Act Contract, in which case the minimum parcel size shall be 80 acres gross. Permitted uses include, but are not limited to:

- Primary: livestock grazing, dry land farming, ranching facilities, wildlife and botanical preserves, timber harvesting, etc.; one single-family dwelling unit.
- Compatible: irrigated croplands, water storage or ground water extraction, recharge areas, mineral and petroleum exploration, recreational activities, etc.

Mineral and Petroleum

Applies to areas, which contain producing, or potentially productive, petroleum fields and mineral deposits. Uses are limited to activities directly associated with resource extraction. Minimum parcel size is 5 acres gross. Permitted uses include, but are not limited to:

- Primary: mineral and petroleum exploration and extraction.
- Compatible: extensive and intensive agriculture, mineral and petroleum processing, pipelines, power transmission facilities, communication facilities, equipment storage yards, and one single-family dwelling unit (subject to a Conditional Use Permit).

SPECIAL TREATMENT AREAS

These are areas for which area-wide land use plans have been prepared or approved. They include both “Accepted County Plan Areas” and “Rural Community” plans:

- Accepted County Plan Areas: Specific land use areas for which plans have been prepared and approved.
- Rural Community: Settlements in the County that have individual character and are recognized as unique communities meriting Specific Plan level of detail.

PHYSICAL CONSTRAINTS

Includes overlay zones denoting physical constraints. Those applicable include:

- Flood Hazard: Based on the Flood Hazard Boundary Maps of the US Department of Housing and Urban Development and the Kern County Water Agency. These areas include, for example, flood channels and watercourses, riverbeds, and gullies. Development within these areas is subject to review by the County and will include conformity with adopted ordinances.
- Steep slopes: Land with an average slope of 30 percent or steeper.

The following tables indicate the Kern County General Plan land use designations and existing land uses of the proposed project and transmission line corridors.

The existing general plan land use designations for the facility are represented in **LAND USE Table 1**.

LAND USE Table 1

Location or Linear Facility	Land Use Designation
Pastoria Energy Facility and Laydown Area	Extensive Agricultural/Intensive Agriculture/Mineral and Petroleum/Nonjurisdictional Lands
Route 1Transmission Line Route	Extensive Agricultural/Mineral and Petroleum/Nonjurisdictional Lands
Route 2A Water Supply Line	Mineral and Petroleum/Extensive Agricultural/Intensive Agricultural/Mineral and Petroleum
Route 3 Proposed Fuel Gas Supply Line	Mineral and Petroleum/Extensive Agricultural/Intensive Agricultural
Route 5 Access Road	Extensive Agricultural/Mineral and Petroleum/Nonjurisdictional Lands

The existing land uses for the facility are represented in **LAND USE Table 2**.

LAND USE Table 2

Location or Linear Facility	Existing Land Uses
Pastoria Energy Facility and Laydown Area	Undeveloped/Gravel Pit/CA Aqueduct/Agriculture
Route 1Transmission Line Route	Undeveloped/Gravel Pit/CA Aqueduct/Agriculture
Route 2A Water Supply Line	Undeveloped/Agriculture/Oil Fields
Route 3 Proposed Fuel Gas Supply Line	Undeveloped/Gravel Pit/Agriculture/Oil Wells
Route 5 Access Road	Undeveloped/Gravel Pit/CA Aqueduct/Agriculture

LAND USE PLANS AND POLICIES RELATED TO PEF

The following provisions of the Kern County General Plan, and U.S. Fish and Wildlife Service are specific to the proposed project. Please refer to the **Socioeconomic Resources** and **Noise** sections of the Preliminary Staff Assessment (PSA) for a discussion of the applicable policies of the Kern County General Plan. Please refer to the **Biological Resources** section of the PSA for a discussion of the applicable policies of the U.S. Fish and Wildlife Service and the California Department of Fish and Game.

NONJURISDICTIONAL LAND

- Coordination and cooperation will be promoted among the County, the incorporated cities and the various special districts where their planning decisions and actions affect more than a single jurisdiction (Policy No. 1).
- Land under state and federal jurisdiction will be considered as land designated for “Resource Management” on the General Plan map (Policy No. 4).

PHYSICAL CONSTRAINTS

- Kern County will not permit new developments to be sited on land that is environmentally unsound to support such development (Policy No. 1).
- Development will not be allowed in natural hazard areas pending the adoption of ordinances that establish conditions, criteria and standards in order to minimize risk to life and property posed by those risks (Policy No. 2).
- Zoning and other land use controls will be used to regulate and, in some instances, to prohibit development in hazardous areas (Policy No. 3).
- New development will not be permitted in areas of landslide or slope instability as designated in the Safety and Seismic Safety Element of the General Plan, and as mapped on the Kern County Seismic Hazard Atlas (Policy No. 6).
- Regardless of percentage of slope, development on hillsides will be sited in the least obtrusive fashion, thereby minimizing the extent of topographic alteration required (Nonjurisdictional Land - Policy No. 1, p. 1 - Policy No. 9)
- Development proposed in areas with steep slopes will be reviewed for conformity to the adopted Hillside Development Ordinance to ensure that appropriate stability, drainage, and sewage treatment will result (Policy No. 10).
- Designated flood channels and watercourses, such as creeks, gullies, and riverbeds will be preserved as resource management areas or, in the case of the urban areas, as linear parks (Policy No. 12).
- New development will be required to demonstrate the availability of adequate fire protection and suppression facilities (Policy No. 13).
- Kern County will evaluate the potential noise impacts of any development-siting action or of any applications it acts upon that could significantly alter noise levels in the community and will require mitigative measures where significant adverse effects are identified (Policy No. 14).
- The air quality effects of a proposed land use will be considered when evaluating development proposals (Physical Constraints - Policy No. 15, p. 2-3).
- Kern County will disapprove projects found to have significant adverse effects on Kern County’s air quality, unless the Board of Supervisors, Board of Zoning Adjustment, or the Director of Planning and Development Services, acting as Hearing Officer or Parcel Map Advisory Agency makes findings under CEQA (Policy No. 16).

SPECIAL TREATMENT AREAS

- In areas designated “Specific Plan Required” with more than one owner, the interim designations will reflect the existing zoning pattern until the County prepares and adopts a Specific Plan (Policy 3(b)).

RESOURCE

- Areas designated agricultural use, which include Class I and II agricultural soils with surface water delivery systems will be protected against residential and commercial subdivision and development activities (Policy No. 1).
- Areas identified by the Soil Conservation Service as having high range-site value will be reserved for extensive agricultural use or as resource reserves if located within a County water district (Policy No. 2).
- In areas with a Resource designation on the General Plan map, only industrial activities which directly and obviously relate to the exploration, production, and transportation of the particular resource will be considered to be consistent with this plan (Policy No. 4).
- Development will be constrained, pending adoption of ordinances, which establish conditions, criteria, and standards, in areas containing valuable resources in order to protect the access to and economic use of these resources (Policy No. 9).
- Rivers and streams in the County are important visual and recreational resources and wildlife habitats. Areas of riparian vegetation along rivers and streams will therefore be preserved when feasible to do so (Policy No. 11).
- The County will maintain and enhance air quality for the health and well being of County residents by encouraging land uses which promote air quality and good visibility (Policy No. 13).
- Habitats of threatened or endangered species should be protected to the greatest extent possible (Policy No. 14).
- Areas designated as Resource Reserve, Extensive Agriculture, and Resource Management which are presently under Williamson Act Contracts will have a minimum parcel size of 80 acres until such time as a contract expires or is canceled, at which time the minimum parcel size will become 20 acres (Policy No. 15).

GENERAL PROVISIONS

- Prior to issuance of any development or use permit, the County shall make the finding, based on information provided by California Environmental Quality Act (CEQA) documents, staff analysis, and the applicant, that adequate public or private services and resources are available to serve the proposed development. The developer shall assume full responsibility for costs incurred in service extensions or improvements that are required as a result of the proposed project (Policy No. 3).

- The air quality implications of new development will be considered in approval of major developments or area wide land use designations (Policy No. 15).
- The County will promote the preservation of designated historic buildings and the protection of cultural resources which provide ties with the past and constitute a heritage value to residents and visitors (Policy No. 16).
- Maintain the County's inventory of areas of potential cultural and archaeological significance (Implementation G).

FISH AND WILDLIFE

- Encourage programs to locate and determine populations of rare and endangered species (Implementation, P. 85).

ENERGY ELEMENT OF THE KERN COUNTY GENERAL PLAN

- The County shall encourage the development and upgrading of transmission lines and associated facilities (e.g., substations) as needed to serve Kern County's residents and access the County's generating resources, insofar as transmission lines do not create significant environmental or public health and safety hazards (Policy No. 1).
- The County shall review proposed transmission lines and their alignments for conformity with the Land Use Element of the Kern County General Plan (Policy No. 2).
- In reviewing proposals for new transmission lines and/or capacity, the County shall assert a preference for upgrade of existing lines and use of existing corridors where feasible (Policy No. 3).
- The County shall work with other agencies in establishing routes for proposed transmission lines (Policy No. 4).
- The County shall discourage the siting of above ground transmission lines in visually sensitive areas (Policy No. 5).
- The County should encourage new transmission lines to be sited/configured to avoid or minimize collision and electrocution hazards to raptors (Policy No. 6).
- The County should monitor the supply and demand of electrical transmission capacity locally and statewide (Implementation A).
- The County shall continue to maintain provisions in the Zoning Ordinance and update as necessary to provide for transmission line development (Implementation B).

KERN COUNTY ZONING CODE

The Kern County Zoning Ordinance was adopted in July 1997. The ordinance implements the Kern County General Plan by applying development standards and construction requirements on land as it is developed within the unincorporated areas of

the county. The following sections of the Kern County Zoning Ordinance apply to the project: Section 19.80.30 of Chapter 19.80 (Special Development Standards – Commercial and Industrial Districts); Sections 19.82.030 and 19.82.090 of Chapter 19.82 (Offstreet Parking - Design and Development Standards); and Section 19.86.060 of Chapter 19.86 (Landscaping Standards – Industrial Uses). The following zoning divisions of the Kern County Zoning Ordinance apply to the project.

ZONING DISTRICTS

EXCLUSIVE AGRICULTURE (A)

Areas that are suitable for agricultural uses. This designation is designed to prevent the encroachment of incompatible uses onto agricultural lands and the premature conversion of such lands to non-agricultural uses. Permitted uses in the "A" District are limited primarily to agriculture and other activities compatible with agriculture.

LIMITED AGRICULTURE (A-1)

Areas that are suitable for a combination of estate-type residential development, agricultural uses, and other compatible uses.

The following table indicates the Kern County zoning designations of the proposed project and linear corridors.

Zoning Designations Within The Affected Environment

Location or Linear Facility	Zoning Designations
Pastoria Energy Facility and Laydown Area	A Exclusive Agriculture
Route 1Transmission Line Route	A Exclusive Agriculture/ A-1 Limited Agriculture
Route 2A Water Supply Line	A Exclusive Agriculture
Route 3 Proposed Fuel Gas Supply Line	A Exclusive Agriculture
Route 5 Access Road	A Exclusive Agriculture

SETTING

The proposed project is located in western Kern County, about 30 miles south of Bakersfield, California. The site is located about 6.5 miles east of Grapevine, California. The plant site is within an undeveloped area owned by Tejon Ranch Company. The land is currently under Williamson Act contract, although no active agricultural uses are occurring on the site (PEF 1999a). There are no residences, parks, recreational, educational, religious, health care facilities, or commercial uses on the site or within a one-mile radius of the site. Surrounding land uses are agriculture and grazing; a gravel mine is southeast of the proposed site. Please refer to the **Project Description** for a map showing the regional location of the project. Components of the project and their impacts are discussed below.

IMPACTS

WILLIAMSON ACT CANCELLATION

Under the Williamson Act, an owner of agricultural land may enter into a contract with the county whereby the landowner agrees to restrict the use of the land for the production of commercial food or fiber for a term of not less than ten years. Certain compatible uses are allowed on the property. In return, the landowner is taxed on the capitalization of the income from the land and not on the fair market value. The term of the contract is automatically extended each year unless notice of cancellation or nonrenewal is given. Contract cancellation involves a comprehensive review and approval process, and the payment of fees by the landowner equal to twelve percent of the full market value of the property.

Currently, in Kern County there are one million acres of land in the Williamson Act. The proposed site and laydown area is situated on land that is currently in the Williamson Act. Because the proposed site is to be utilized for non-agricultural purposes, the applicant has submitted to Kern County a petition for of cancellation for a twenty-five-acre portion of lot 37 within the SW ¼Section 7 designated as Assessor's Parcel Number 241-310-04 (Government Code Section 51282). The Agricultural Preserve, which APN 241-310-04 is a portion, contains about 1,298 acres The cancellation procedure is a discretionary act and requires a public hearing before the Kern County Board of Supervisors. A copy of the PEF Petition for Cancellation is attached as Appendix A. Kern County will have to make the following findings for contract cancellation.

<u>Section 51282, Government Code, State of California</u>

<u>Petition for Cancellation of Contract; Grounds</u>

(a) The landowner may petition the Board of Supervisors for cancellation of any Contract as to all or any part of the subject land. The Board may grant tentative approval for cancellation of a Contract only if it makes one of the following findings:

(1) That the cancellation is consistent with the purposes of Chapter 7 of Title 5 of the Government Code; or
(2) That cancellation is in the public interest.

(b) For the purposes of paragraph (1) of subdivision (a), cancellation of a Contract shall be consistent with the purposes of Chapter 7 only if the Board makes all of the following findings:

(1) That the cancellation is for land on which a notice of nonrenewable has been served pursuant to Section 51245.

Applicant's Consistency Response: Applicant has filed a cancellation of non-renewal for a 20-acre portion of a 160-acre parcel of land.

(2) That cancellation is not likely to result in the removal of adjacent lands from agricultural use.

Applicant's Consistency Response: The Pastoria Energy Facility is not a development that is likely to attract or require additional development on adjacent lands. No known urban development is presently planned within 5 miles of the facility. Much of the adjacent lands will remain restricted by Land Use Contracts that prohibit use for purposes other than agriculture, open space, and compatible uses.

(3) That cancellation is for an alternative use which is consistent with the applicable provisions of the County General Plan.

Applicant's Consistency Response: The cancellation property has been used primarily for grazing. The Pastoria Energy Facility is a nominal 750 MW merchant–class electrical generating facility, an energy-producing industrial use in an area that already includes petroleum and energy related uses.

The proposed plant site is zoned Exclusive Agriculture (A), which is consistent with the Kern County General Plan. Under Section 19.12.030 (G) of the Kern County Code, an electrical power generating plant, such as the Facility, is a conditional permitted land use in this zone.

(4) That cancellation will not result in discontiguous patterns of urban development.

Applicant's Consistency Response: The proposed Facility, an industrial facility, is not an urban (i.e., citylike) development. The siting of the facility itself, therefore, does not result in a discontiguous pattern of urban development. The Facility is unlikely to attract urban development for the reasons set forth above, and therefore, will indirectly result in a discontiguous pattern of urban development. To the extent one might consider such industrial development to be urban, the facility is being located on a site that is near existing industrial development: the gravel mines, the Edmonston Pumping Plant and the California Aqueduct.

(5) That there is no proximate non-Contracted land which is both available and suitable for the use to which it is proposed the Contracted land be put, or, that development of the Contracted land would provide more contiguous patterns of urban development than development of proximate non-Contracted land.

Applicant's Consistency Response: The facility site and the configuration of the facility were selected to the best match operating needs for the transmission grid and the competitive power market. The non-contracted land south of the site is not suitable for the facility, because of its proximity to Pastoria Creek and the abandoned and active gravel quarries. Moving the site south so that it is entirely on non-contracted would place the facility too close to the creek.

(a) For purposes of paragraph (2) of subdivision (a), cancellation of a Contract shall be in the public interest only if the Board makes the following findings:

(1) That other public concerns substantially outweigh the objectives of Chapter 7; and

(2) That there is no proximate non-Contracted land which is both available and suitable for the use to which it is proposed the Contracted land be put, or, that development of the Contracted land would provide more contiguous patterns of urban development than development of proximate non-Contracted land.

(b) For purposes of subdivision (a), the uneconomic character of the existing agricultural use shall not be itself be sufficient reason for cancellation of the Contract. The uneconomic character of the existing use may be considered only if there is no other reasonable or comparable agricultural use to which the land may be put.

(c) The landowner's petition shall be accompanied by a proposal for a specified alternative use of the land. The proposal for the alternative use shall list those governmental agencies known by the landowner to have permit authority related to the proposed alternative use, and the provisions and requirements of Section 51283.4 shall be fully applicable thereto. The level of specificity required in a proposal for a specified alternative use shall be determined by the Board as that necessary to permit them to make the findings required.

(d) In approving a cancellation pursuant to this section, the Board shall not be required to make any findings other than or in addition to those expressly set forth in this section and, where applicable, in Section 21081 of the Public Resources Code.

PARCEL MAP

As part of the project, the applicant proposes to create a 33-acre parcel on which the project will be constructed. Because PEF will lease land for the proposed power plant from Tejon Corporation, the Kern County Planning Department determined that PEF file an application for a parcel map in order to satisfy provisions of the Subdivision Map Act. The proposed 33-acre parcel will consist of portions of APN 241-190-11 and APN 241-310-04. The proposed parcel will be consistent with the twenty-acre

minimum parcel size in the Exclusive Agriculture (A) zone. Each of the original parcels contains 160 acres. APN 241-310-04 is currently in the Williamson Act.

On July 7, 2000, staff spoke with Mr. David Rickels, Senior Planner with Kern County Planning Department regarding submittal of the parcel map by the applicant. PEF has submitted a parcel map for review to Kern County. Under the Kern County Land Division Ordinance (Chapter 18.25), when a parcel map is submitted, Kern County is required to send a fifteen-day notice of opportunity for public hearing to adjacent property owners. If a property owner thinks there is reason to hold a public hearing on the parcel map, Kern County must schedule a hearing within thirty days after the request for hearing. If there is no request for public hearing, then approval of the parcel map is subject to the discretion of the Kern County Planning Director.

CONSTRUCTION OF POWER PLANT

The project site is situated on undeveloped land owned by Tejon Ranch and is currently used for cattle grazing. Land use in the area consists of agriculture, grazing, and oil and gas development. The project site is designated Extensive Agriculture in the Kern County General Plan. Based on policies in the Kern County General Plan, the project is compatible with the existing land use designation. The site is zoned (A) Exclusive Agriculture. The project also includes a 25-acre laydown construction area. The laydown area consists of a portion of Assessor's Parcel Number 241-190-11, and is zoned Exclusive Agriculture. As part of project development, the property owner has entered into a compensation contractual agreement with PEF for temporary use of the 25 acres of Assessor's Parcel Number 241-190-11. The proposed laydown area is currently used for cattle grazing. Once project construction is completed, the laydown area will be tilled to aerate the soil and PEF will reseed the area with grasses and release the property to the owner, who will continue to use the area as rangeland (PEF 2000n). Because the laydown area would only temporarily preclude agricultural usage of the land (grazing), and because the land would be restored to its original condition, the impact to agriculture would not be significant.

Power plants are a conditional use in the Exclusive Agriculture zone. Thus, for the project to be consistent with the Kern County Zoning Ordinance, the project must comply with certain conditions of approval, set forth by the Kern County Planning Department, and specified under **MITIGATION** below.

According to the Kern County Important Farmland Land Statistics for 1996-1998, approximately 1,598,513 acres are designated important farmland and grazing land with 1,000,000 acres contracted under the Williamson Act.

The statistics also reflect that from 1996-1998, approximately 11,000 acres of Kern County farmland was taken out of active agricultural production. Of that, 1,386 acres were urbanized. The conversion of agricultural land to urban uses has generally occurred adjacent to cities and local townships. During the last 10 months of 1996, approximately 63 Williamson Act contracted acres were cancelled. No recent acreage numbers were available as to contracted acres cancelled to date. Although 63-acres

of Williamson Act contracted acres were cancelled in 1996, this does not reflect that eventual urban development will occur on these lands.

The cancellation request of 20-acres by Tejon Ranch for the development of the PEF power plant does not reflect a significant amount of land taken out of agricultural usage. Considering the 20-acres has been used for cattle grazing, and not actively farmed, staff does not believe that the removal of this land for a power plant will spur eventual development of the surrounding area.

CONSTRUCTION OF TRANSMISSION LINE ROUTE, LINEARS, AND IMPACTS TO AGRICULTURAL RESOURCES

Information contained in the AFC states that the proposed 230 kV Transmission Line Route 1 will parallel existing transmission lines and will be situated on land that is generally used for cattle grazing. The 230 kV route will pass through land zoned (A) Exclusive Agriculture and (A-1) Limited Agriculture. Under the Kern County Zoning Ordinance, transmission lines are permitted by right in all zones, and require no discretionary permits from the county (Kern County Zoning Ordinance Section 19.08.090). The disturbed areas around the transmission lines will be tilled to aerate the soil and PEF will reseed the area with grasses. Therefore, Energy Commission staff does not consider construction of the 230 kV line to be an adverse or significant impact to agricultural use. In addition, there are no residences, parks, recreational, educational, religious, health care facilities, or commercial uses within the proposed transmission corridor.

The proposed Route 2A Water Supply Line route will pass through land zoned (A) Exclusive Agriculture. Under the Kern County Zoning Ordinance, linear facilities such as gas and water lines are permitted by right in all zones, and require no discretionary permits from the county (Kern County Zoning Ordinance Section 19.08.090). The disturbed areas around the water supply line will be tilled to aerate the soil and PEF will reseed the area with grasses. Therefore, Energy Commission staff does not consider construction of the proposed water line to be an adverse or significant impact to agricultural use. There are no residences, parks, recreational, educational, religious, health care facilities, or commercial uses within this corridor.

Information contained in the AFC states that the proposed Route 3 Fuel Gas Pipeline will not traverse irrigated agricultural lands. The proposed fuel gas line will pass through land zoned (A) Exclusive Agriculture. Under the Kern County Zoning Ordinance, linear facilities such as gas and water lines are permitted by right in all zones, and require no discretionary permits from the county (Kern County Zoning Ordinance Section 19.08.090). The disturbed areas around the proposed fuel gas line will be returned to the original condition (i.e., reseeding, replacement of orchard trees as necessary, reshaping of soil disturbance for row crop production). Therefore, Energy Commission staff does not consider construction of the proposed gas line to be an adverse or significant impact to agricultural use. In addition, there are no residences, parks, recreational, educational, religious, health care facilities, or commercial uses within the proposed gas line corridor.

CUMULATIVE IMPACTS

In general, Energy Commission staff considers conversion of agricultural lands to non-agricultural uses, and changes in land use patterns to be significant cumulative impacts.

Existing land use in western Kern County is characterized by oil fields and natural resource development, with land designated and zoned for agricultural use, grazing, resource extraction, and energy development uses. In addition to the proposed project, other regional projects include La Paloma, Elk Hills, Sunrise, and Midway Sunset. Because these projects are located within existing oil fields, no conversion of agricultural lands or changes in land use patterns are expected to occur as a result of project construction and operation. PEF will require cancellation of a portion of land in the Williamson Act. As stated above, although the proposed site is currently used for cattle grazing, the loss of this parcel to cattle grazing is not significant for Kern County. For these reasons, Energy Commission staff finds that La Paloma, Elk Hills, Sunrise, Midway Sunset and PEF will not have a significant adverse cumulative impact on agricultural land use in western Kern County.

CONSISTENCY WITH LAND USE PLANS, POLICIES, AND REGULATIONS

The project site is designated Extensive Agriculture in the Kern County General Plan. Based on policies in the Kern County General Plan, the project is compatible with this land use designation. The site is zoned Exclusive Agriculture (A). The proposed transmission line route will traverse lands zoned Exclusive Agriculture. The Kern County Zoning Ordinance states that resource extraction, and energy development uses in these zones are permitted by right, and require no discretionary permits from the county. However, power plants are a conditional use in this zone. Therefore, to satisfy certain provisions of Chapters 19.12, 19.82, and 19.86 of the Kern County Zoning Ordinance, Energy Commission staff has required PEF to prepare a site development plan that includes provisions to satisfy the following requirements of the Kern County Zoning Ordinance (please refer to **MITIGATION**, below). As stated above, PEF has a parcel map for construction of the project to Kern County for their review. If this parcel or any other parcel is to be created for the purpose of lease, sale, or finance, its creation must comply with the California Subdivision Map Act and the Kern County Land Division Ordinance. The Energy Commission staff will not recommend project certification without the approval and recordation from Kern County of a final parcel map.

With eventual submittal and approval of the parcel map, cancellation of the Williamson Act contract for a portion of parcel 241-310-04, and proposed condition of certification **LAND-1**, PEF will comply with all federal, state, and local applicable laws, ordinances, regulations, standards, plans and policies.

FACILITY CLOSURE

PLANNED 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. Facility closure would have to comply with all applicable policies in the Kern County General Plan and ordinances in effect at the time of closure.

UNEXPECTED TEMPORARY CLOSURE

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

UNEXPECTED PERMANENT CLOSURE

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

In February 1997, the Compliance Office of the Energy Commission conducted a Plant Closure Survey. The survey was sent to various local and state agencies to determine whether these agencies had any regulations or compliance procedures regarding the closure of power plants and other large industrial facilities. At that time, Kern County responded that they had no requirements for a closure plan and no requirements for site restoration. At present, Kern County has no specific requirements regarding closure and site restoration. However, they have requested that any closure plans required by the Energy Commission be subject to an advisory review by Kern County. In that way, Kern County could provide site/project specific comments at that time (Rickels 1999).

MITIGATION

PEF has proposed two mitigation measures that they will implement for the proposed project to avoid or minimize land use impacts associated with the construction and operation of the generating plant, transmission line route, and other linear facilities. Staff has incorporated PEF's mitigation measures (listed below) into the proposed conditions of certification as **LAND-1**. These conditions will be part of the site development plan that PEF submits to the Kern County Planning Department.

- Comply with regulatory agency permits and requirements concerning land use issues.

- If agricultural facilities (e.g. irrigation systems, fences, and gates) are damaged, repair or replace these facilities.

Kern County normally would require a conditional use permit for this type of project. However, local agency requirements are superseded by Energy Commission action on certification. Therefore, to ensure compliance with the Kern County Zoning Ordinance, staff has required PEF to prepare a development plan that complies with Kern County's zoning conditions of approval (**LAND-1**). Kern County's zoning conditions of approval are stated below. Please refer to **Water and Soils, Worker Safety, Public Health, Air Quality, Facility Design, Socioeconomic Resources, and Visual,** for analysis of Kern County zoning conditions of approval relative to each technical area.

1. The applicant shall comply with requirements of the Subdivision Map Act and Kern County Land Division Ordinance.

2. The applicant shall submit proof of road access that meets the requirements of the Kern County Engineering and Survey Services Department.

3. A minimum of 32 on-site parking spaces shall be provided.

4. All vehicle parking and maneuvering areas and access roads shall be surfaced with a minimum of two inches of Asphalt Composite paving or material of higher quality.

5. Vehicle parking spaces shall be 9 feet by 20 feet or larger in size and shall be designated by white painted stripes, except as provided in Sections 19.82.030 and 19.82.040 of the Zoning Ordinance.

CONCLUSION AND RECOMMENDATION

Energy Commission staff's analysis indicates that the project by itself, and cumulatively, will have no land use impacts that cannot be mitigated to a level below significance. If staff's conditions of certification are implemented, and with submittal and approval of the parcel map, and cancellation of the Williamson Act contract, the project will comply with all applicable laws, ordinances, regulations, standards, plans and policies. If the Commission certifies the proposed project, staff recommends that it adopt the following conditions of certification. As stated above, PEF has submitted a parcel map for construction of the project to Kern County for their review and approval. Ultimately, PEF must be in compliance with the California Subdivision Map Act, Kern County Land Division Ordinance, and the Williamson Act. If not in compliance, the project cannot be granted certification without an override by the Energy Commission.

PROPOSED CONDITIONS OF CERTIFICATION

LAND USE-1 Prior to the issuance of building or grading permits, the project owner shall submit a site development plan for the project to Kern County for their

review and comment, and to the California Energy Commission Compliance Project Manager (CPM) for review and approval. The site development plan shall comply with all applicable provisions of Chapters 9.12, 19.82, and 19.86 of the Kern County Zoning Ordinance. The project owner shall provide a letter of comment from the Kern County Planning Director stating that the project is consistent with the provisions of the Kern County General Plan and Zoning Ordinance.

Protocol: The project owner shall submit to the CPM for review and approval a site development plan. The project owner shall submit a letter to the CPM from the Kern County Planning Director stating that the site development plan conforms to Kern County's Zoning Code and is consistent with the General Plan. If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

Verification: At least 60 days prior to the start of any ground disturbance related to construction, the project owner shall submit the proposed site development plan and a copy of the letter of comment from the Kern County Planning Director to the CPM for review and approval. The project owner shall submit any required revisions within 30 days of notification by the CPM.

LAND USE-2 Once project construction is completed, PEF will reseed the 25-acre laydown area with grasses and release the property to the owner of record. All areas which have been disturbed by the installation of the transmission lines and underground gas, wastewater, and water lines will be reseeded and/or reestablished to original condition (i.e., row crop, orchard, grazing).

Verification: Within 30 days after reseeding of the subject property the project owner shall submit to the CPM written notification that the 25-acre laydown area has been reseeded to the satisfaction of the owner of the parcel, and that the parcel is ready for inspection. Within 30 days after reseeding of areas disturbed by installation of the transmission lines and underground gas, wastewater, and water lines, the project owner shall submit to the CPM written notification that these areas have been reseeded and that they are ready for inspection.

REFERENCES

CDC (DOGGR) (Department of Conservation (Division of Oil, Gas, and Geothermal Resources)/Marshall) 2000a. Review and Comments on the Pastoria Energy Facility. Submitted to the California Energy Commission on January 3, 2000.

CEC (California Energy Commission/Lewis) 2000b. Pastoria Energy Facility – First Set of Data Requests (Numbers 1 to 44). Submitted to California Energy Commission on March 3, 2000.

CEC (California Energy Commission) 2000c. Supplemental Filling – Clarification in Technical Project Areas. Submitted to the Agency Distribution List on February 2, 2000. California Energy Commission Docket Unit received on February 4, 2000.

Department of Conservation. http://www.consrv.ca.gov.

Kern County Farm Bureau. http://www.co.kern.ca.us/farm.

Kern County General Plan, adopted March 1982. Revised March 1994.

Kern County Zoning Ordinance, July 1997.

PEF (Pastoria Energy Facility) 1999a. Application for Certification, Volumes I and II, Pastoria Energy Facility Project (AFC-99-7). Submitted to the California Energy Commission on November 30, 1999.

PEF (Pastoria Energy Facility) 2000a. Response to CEC Data Adequacy Comments; dated December 29, 1999 (Supplement to AFC-99-7). Submitted to the California Energy Commission on January 5, 2000.

PEF (Pastoria Energy Facility/Parquet) 2000a. Project Description Clarification for the Pastoria Energy Facility. Submitted to California Energy Commission/Rhoads on March 1, 2000.

PEF (Pastoria Energy Facility/Thompson) 2000a. Recommended Mitigation Measures and Draft Compliance Plans/Outlines. Submitted to California Energy Commission on March 6, 2000.

PEF (Pastoria Energy Facility /Scholl) 2000a. Response to Data Requests 2000 (First Data Response submittal). Submitted to the California Energy Commission on March 13, 2000.

PEF (Pastoria Energy Facility/Scholl) 2000b. Response to Staff Data Requests (Second Data Response Submittal). Submitted to the California Energy Commission on March 20, 2000.

PEF (Pastoria Energy Facility/Thompson) 2000f. Applicant's Data Request Responses (Third Data Response Submittal). Submitted to the California Energy Commission on April 3, 2000.

Rickels, David. Senior Planner, Kern County Planning Department. February 17, 2000 FAX to Amanda Stennick regarding Petition for Williamson Act Land Use Contract Cancellation.

Rickels, David. Senior Planner, Kern County Planning Department. Conversation with staff on June 22, 2000.

Rickels, David. Senior Planner, Kern County Planning Department. March 20, 2000 FAX to Amanda Stennick regarding conditions of approval for Pastoria project.

URS Greiner (URS Greiner Woodward Clyde/Scholl) 2000k. Response to Data Requests – Maps. Submitted to the California Energy Commission on March 13, 2000.

LAND USE APPENDIX A

TRAFFIC AND TRANSPORTATION

James Fore

INTRODUCTION

The Traffic and Transportation section of the Preliminary Staff Assessment addresses the extent to which the Pastoria Energy Facility, (PEF) project may impact the transportation system within the vicinity of its proposed location. This section summarizes the separate analyses by the Pastoria Energy Facility, Limited Liability Corporation, (PEF, LLC) in the Application for Certification (AFC) and the staff of the California Energy Commission on the potential traffic and transportation impacts associated with construction and operation of the PEF. These analyses included the evaluation and identification of:

- The influx of construction workers for the project and how they could increase roadway congestion and affect traffic flow during the course of construction;
- The roads and routings which the project proposes to use;
- Potential traffic related problems associated with those routes;
- The anticipated delivery of oversize/overweight equipment that could cause increased roadway congestion and increased traffic hazards;
- The anticipated encroachment upon public right-of-ways during the construction of the proposed project and associated appurtenant facilities;
- The frequency of trips and probable routes associated with the delivery of hazardous materials; and
- The availability of alternative transportation methods such as rail.

Staff has analyzed the information provided in the AFC and from other sources to determine the potential for the project to have significant traffic and transportation impacts and to assess the availability of mitigation measures, which could reduce or eliminate the significance of those impacts. Conditions of certification are included to implement the appropriate mitigation measures and to insure that the project complies with the applicable Laws, Ordinances, Regulations and Standards (LORS).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

The federal government addresses transportation of goods and materials in Title 49, Code of Federal Regulations:

- Title 49, Code of Federal Regulations, section 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, section 350-399, and Appendices A-G, Federal Motor Carrier Regulations, addresses safety considerations for the transport of goods, materials and substances over public highways.

STATE

The California Vehicle Code and the Streets and Highways Code contain requirements applicable to the licensing of drivers and vehicles, the transportation of hazardous materials and right-of-way. In addition, the California Health and Safety Code addresses the transportation of hazardous materials. Specifically, these codes include:

- California Vehicle Code, section 353, defines hazardous materials.

- California Vehicle Code, sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon.

- California Vehicle Code, section 31030, requires that permit applications shall identify the commercial shipping routes they propose to utilize for particular waste streams.

- California Vehicle Code, sections 31600-31620, regulates the transportation of explosive materials.

- California Vehicle Code, sections 32000-32053, regulates the licensing of carriers of hazardous materials and includes noticing requirements.

- California Vehicle Code, sections 32100-32109, establishes special requirements for the transportation of inhalation hazards and poisonous gases.

- California Vehicle Code, sections 34000-34121, establishes special requirements for the transportation of flammable and combustible liquids over public roads and highways.

- California Vehicle Code, sections 34500, 34501, 34501.2, 34501.4, 34501.10, 34505.5-7, 34507.5 and 34510-11, regulate the safe operation of vehicles, including those which are used for the transportation of hazardous materials.

- California Vehicle Code, sections 2500-2505, authorize the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives.

- California Vehicle Code, sections 13369, 15275, and 15278, address the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, it requires the possession of certificates permitting the operation of vehicles transporting hazardous materials.

- California Streets and Highways Code, sections 117 and 660-72, and California Vehicle Code 35780 et seq., require permits for the transportation of oversized loads on county roads.

- California Streets and Highways Code, sections 660, 670, 1450, 1460 et seq., 1470, and 1480, regulate right-of-way encroachment and the granting of permits for the encroachment on state and county roads.

- California Health and Safety Code, sections 25160 et seq., address the safe transport of hazardous materials.

LOCAL

KERN COUNTY

The Circulation Element of the Kern County General Plan sets up local goals and guidance policies about building and transportation improvements. It introduces planning tools essential for achieving the local transportation goals and policies (County of Kern, 1972). Relevant goals and policies include, in part, the following:

PRIVATE DEVELOPMENT ACCESS TO EXISTING ROADWAY NETWORK

As a condition of private development approval, developers shall build roads needed to access the existing road network. Developers shall build these roads to County standards (Policy No. 1).

GROWTH BEYOND 2010

The County should monitor traffic volumes and patterns on County major highways (Policy No. 1).

Development applications must demonstrate that sufficient transportation capacity is available to serve the proposed project at Level of Service "D" (LOS D) or better.

TRUCKS ON HIGHWAYS

Make the California Department of Transportation (Caltrans) aware of heavy truck activity on Kern County's roads (Policy No. 1).

Start a program that monitors truck traffic operations (Policy 2).

Promote a monitoring program of truck traffic operations (Policy 2).

TRUCKS ROUTES

The Transportation Management Department should oversee truck travel patterns and be made aware of any locations where heavy trucks traverse residential areas (Policy No. 1).

TRANSPORTATION OF HAZARDOUS MATERIALS

State maintained highways are acceptable as commercial hazardous waste transportation routes (Policy No. 1).

Kern County and affected cities should reduce use of County maintained roads and city maintained streets for transportation of hazardous materials (Policy No. 3).

Restrict commercial transportation of hazardous materials in accordance with Vehicle Code, section 31303 (Policy No. 4). This Circulation Element recommends charting routes where hazardous material shipments can go.

ROAD PAVEMENT DAMAGE

The County shall continue to maintain pavement conditions and check operating conditions by collection and review of traffic flow and accident data to rate the circulation system (Policy No. 1).

SETTING

REGIONAL DESCRIPTION

FREEWAYS AND HIGHWAYS

The project site is located in southern Kern County. The proposed power plant is located about 30 miles south of Bakersfield, California and approximately 6.5 miles east of Grapevine, California. The project site will be accessed from Interstate 5 via Edmonston Pumping Plant Road (a private 2-lane road) and the construction of a new plant access road.

The highway and state routes that may be potentially affected by the proposed Pastoria Project include:

- Interstate 5 from Mt. Pinos Road to Highway 46;
- Highway 33 from Highway 166 to Highway 119;
- Highway 43, from Interstate 5 to Highway 46;
- Highway 58 from Highway 223 to Highway 202;
- Highway 99 from Interstate 5 to Highway 155
- Highway 166, from Highway 33 (near Taft) to Highway 99; and
- Highway 223 from Interstate 5 to Highway 58.

Although traffic for the facility will impact these roads to a certain extent all traffic eventually must merge onto Interstate 5 and then exit on the Edmonston Pumping Plant Road, refer to **Traffic and Transportation Figure 1.**

RAILROADS

The Burlington-Northern & Santa Fe (BN&SF) and Union Pacific Railroads provide rail service to the Bakersfield area. There are four rail line corridors in the project region (see Traffic and Transportation Figure 1): the BN&SF Railroad main line; the Union Pacific main line; the Arvin Branch line owned by San Joaquin Railroad Company; and the BN&SF Sunset Pacific Branch line currently operated by Union Pacific.

AIRPORTS

Kern County has several airports located throughout the County. The closest airports to the Pastoria Energy Facility are the Bakersfield Municipal Airport located in the City of Bakersfield, and two small airports located in the community of Tehachapi, Kern County Airport No. 4 and Fantasy Haven Airport. All three of these airports are located approximately 30 miles from the proposed project site.

The Pastoria Energy Facility will have exhaust stacks that exceed 200 feet. Each of the three proposed exhaust stacks will be at least 213 feet tall and could create a hazard to air traffic. The Federal Aviation Authority (FAA) has established that any construction or alteration more than 200 feet in height above the ground level at a site could create an obstruction in navigable air space. Because of this potential obstruction in navigable air space the Pastoria Energy Facility is required to inform the FAA by submitting FAA Form 7460-1, Notice of Proposed Construction or Alteration, to the FAA Regional Office having jurisdiction over the area where the project is located. The Form 7460-1 must be submitted to the FAA on the earlier of the following dates: the date the proposed construction or alteration is to begin, or the date an application for a construction permit is to be filed.

If the FAA determines that the stacks are an obstruction in navigable air space then lighting or marking of the stacks will be required. The lighting and marking standards

are prescribed in the FAA Advisory Circular AC 70/7460-1 entitled, Obstruction Marking and Lighting.

Pastoria Energy Facility has indicated that a lighting system will be installed on each stack as required by the FAA regulation. If this is done then the stack should not present a hazard to flying aircraft.

SITE AND VICINITY DESCRIPTION

The power plant site is located on a 30-acre parcel of undeveloped land owned by the Tejon Ranch in southern Kern County. Access to the power plant site from any direction will be from Interstate 5 at the Grapevine Exit. Traffic will then take the Edmonston Pumping Plant Road for approximately 6.5 miles before exiting on the planned PEF access road. The proposed power plant road will be approximately 0.85 miles long and will be asphalt paved. The plant administration and control building parking lot and the road encircling the power block will be asphalt paved. Other roads on the plant site will be gravel or crushed stone.

Linear Facilities

Potentially affected roadways are those adjacent to or crossed by the proposed project linear components (i.e. transmission line, natural gas pipeline, and water supply and wastewater pipelines).

Transmission Line (Route 1)

The proposed 230 kV transmission line will have a total length of approximately 1.38 miles. The line originates from the switchyard located on the southern side of the Pastoria plant site (Route 1 milepost [MP] 0.0). The transmission line will proceed from the plant site in a southerly direction and terminate at Southern California Edison's (SCE) transmission system via the Pastoria Substation. The entire route for the line is within Kern County. The transmission line will parallel the SCE Pastoria-Magunden transmission line.

The proposed route crosses approximately one mile of undeveloped land, the Edmonston Pumping Plant Road and the California Aqueduct before connecting with the Pastoria Substation. The Edmonston Pumping Plant Road and the California Aqueduct crossing are at MP 0.9 and MP 1.1 respectively. The transmission line also crosses approximately 0.1 miles of land within SCE's Pastoria Substation at MP 1.38.

TRAFFIC AND TRANSPORTATION Figure 1

The transmission line parallels the SCE Pastoria-Magunden transmission line. No proposed residential developments or communities are planned in the study area investigated along the proposed transmission line route. The zoning designation within a 0.5-mile wide corridor of the proposed route is agriculture.

Natural Gas Pipeline (Route 3)

Natural gas will be delivered to the plant site via an underground pipeline that will tie into an existing interstate pipeline jointly owned by the Kern River Gas Company and the Mojave Pipeline Company. PEF has chosen a pipeline line route that is approximately 11.3 miles long and ties into the existing natural gas line north of Sebastian Road.

The Route 3 pipeline will leave the PEF plant site and travel 0.7 miles due east. It will then follow an existing underground aqueduct system for approximately 3 miles in a northeast and north-northeast direction. The pipeline then goes in a northeast direction following a fire road for approximately 1.5 miles. The pipeline then goes due north approximately 1.3 miles on an orchard road. The line then travels northwest approximately 1.9 miles following farm and fire roads on the Tejon Ranch. At this point the line will leave the Tejon Ranch property and go approximately 2.5 miles due west along Sebastian Road. It will then turn North for 0.4 miles across agricultural land where it will tie into the Kern River-Mojave natural gas transmission pipeline.

Make Up-Water Supply Pipeline (Route 2A)

The water supply line will exit the northwest corner of the PEF plant site and go approximately 800 feet north. It will then connect to an existing pipeline owned by the Wheeler Ridge-Maticopa Water storage District. The proposed route will not cross any roadways and is on undeveloped agriculture land located on Tejon Ranch property.

Access Road (Route 5)

The plant will be accessed by a new access road that will originate at the Edmonston Pumping Plant Road. The new road will be an asphalt-paved road constructed to Kern County standards. The road will travel north for approximately 0.85 miles from the Edmonston Pumping Plant Road to the plant site. The plant site access road will be of sufficient width (approximately 40 feet) and strength to provide adequate access to the project site. This road will cross no other roads and will be located on undeveloped land.

TRAFFIC AND TRANSPORTATION CONDITIONS

In assessing a project's potential impact on the local transportation system, the level of service measurement is the basis for analytic evaluations. The Level of Service (LOS) ratings for highways in the project area has been established by Caltrans. The criteria for LOS ratings take into account numerous variables such as the annual average daily traffic (AADT), capacity, grade, environment, and other relevant information. The LOS essentially measures the flow of traffic. Data about the existing traffic and characteristics for highways that the project could affect are given in **TRAFFIC AND**

TRANSPORTATION Table 1, Current Traffic Characteristics of Highways in the Project Area. The Table identifies the AADT, annual average peak-hour traffic, annual average daily truck traffic, percent of truck traffic, highway capacity, and LOS for the highways and roads in the vicinity of the project.

The traffic estimates are presented for various mileposts or junctions on highways that the project may impact. In general the LOS ranges from A, free flowing traffic to F, which represents heavily congested with stoppage of flow. A threshold of LOS D is the minimum standard accepted by both Caltrans and Kern County.

All access to the facility will occur from Interstate 5 via the Edmonston Pumping Plant Road. Since the Edmonston Pumping Plant Road is a private road, traffic data is not available from Kern County Road Department. An estimate of the existing traffic characteristics for the Edmonston Pumping Plant Road was based on field observation of traffic conditions on September 14, 1999**, TRAFFIC AND TRANPORTATION Table 2, Existing Traffic Characteristics of Local Roadways in the Project Area.**

Based on field observations of traffic conducted on September 14, 1999, the average daily traffic was estimated to be 720 trips per day (average of 60 trips per hour time 12 daytime hours). The annual peak hour traffic was based on ten percent of the AADT. The road was considered to have a capacity of 9,000 vehicles per hour per direction. The LOS can be calculated by dividing the volume of traffic (AADT) by the capacity. The LOS for this road was determined to be a class A LOS**.**

No traffic count exists for the Edmonston Pumping Plant Road, but a large truck to car ratio generally characterizes traffic in the area. This is due to the road's use as an access to an adjacent gravel mining operation. Based on the field observation, the AFC has assumed that 50 percent of the traffic on Edmonston Pumping Plant Road would be truck traffic**.**

IMPACTS

The California Environmental Quality Act (CEQA) indicates that a project could have a significant effect on traffic and transportation if the project will:

- Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the highway and road 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).

TRAFFIC AND TRANSPORTATION Table 1

Current Traffic Characteristics of Highways in the Project Area

Highway/Mile post	Location	Annual Average Daily Traffic(1)	Annual Average Peak Hour Traffic(1)	Annual Average Daily Truck Traffic(2)	Percent of Truck Traffic(3)	Highway Capacity (vphpd) (4)	LOS(6)
Interstate 5							
0	Los Angeles-Kern County Line	52,000	7,000	17,820	34	5,520	D
10.15	Grapevine	52,000	6,200	13,770	26	7,360	C
15.86	Jct. Rte 99 North	25,550	2,700	5,250	21	3,560	A
19.61	Jct. Rte 166	23,900	2,550	4,997	21	3,520	C
33.49	Jct. Rte 223	23,200	2,420	4,830	21	3,560	C
38.78	Jct. Rte 119	23,600	2,500	4,914	21	3,560	C
41.19	Jct. Rte 43	23,200	2,450	4,914	21	3,600	C
52.15	Jct. Rte 58	24,100	2,600	7,378	31	3,600	C
65.61	Lerdo Hwy	24,300	2,550	7.953	32	3,600	C
73.02	Jct. Rte 46	23,700	4,200	7,260	31	3,560	C
Highway 33							
11.56	Jct Rte 166-East	4,400	450	1104	26	1,920	C
12.91	County Road P263	6,200	610	NA	NA	1,780	D
17.89	Jct Rte 119-East	8,600	840	2,236	26	1,860	D
Highway 43							
1.9	Jct Rte 5	3,550	320	856	26	1,760	B
8.11	Jct Rte 58-East Rosedale Hwy	3,300	300	795	24	1,690	B
9.16	Jct Rte 58-West McKittrick Hwy	9,600	940	853	9	1,640	A
16.55	East Lerdo Hwy	7,600	670	684	9	1,915	A
25.13	Jct Rte 46-West Famoso Hwy	7,200	650	864	12	1,760	C
25.19	Jct Rte 46-East	3,100	280	498	16	1,760	B
36.67	Garces Hwy (Jct Rte 155)	1,600	150	NA	NA	1,760	A
Highway 58							
75.62	Jct Rte 223-West	18,500	1,750	6,301	34	2,040	B
77.25	Bear Mt. Ranch	18,200	1,800	5,249	28	2,400	B
90.72	Jct Rte 202	19,500	2,650	7,718	37	3,320	B
Highway 99							B
0.75	Jct Rte 5	26,500	1,950	6,240	23	5,280	B
2.73	Jct Rte 166	28,000	3,050	6,600	24	5,280	B
13.41	Jct Rte 223	32,500	3050	6,840	21	5,280	B
17.50	Jct Rte 119	42,000	3,650	8,250	20	5,520	B
23.51	Jct Rte 58-East	108,000	11,000	20,520	19	7,280	C
25.65	Jct Rte 58 West-Jct 178 West	114,000	11,600	20,520	18	7,170	D
27.05	Jct Rte 204	73,000	5,800	27,170	37	5,340	C
29.88	Jct Rte 65	59,000	6,100	17,110	29	5,340	C
44.31	Jct 46	39,000	3,500	11,165	29	5,340	B
55.52	Jct Rte 155	36,000	2,700	9,940	27	3,600	B
Highway 166							
0.01	Jct Rte 33 North	36,000	280	860	27	1,260	C
22.80	Jct Rte 5 Freeway	2,200	200	601	27	1,820	B
24.62	Jct Rte 99	2,600	240	725	28	1,820	B
Highway 223							
1.85	Jct Rte 5	3650	310	667	18	1,600	A
10.94	Jct Rte 99	4,250	350	1,178	27	1,760	B
21.17	Derby Street	2,100	180	NA	NA	1,690	B
31.92	Jct Rte 58	1,150	100	290	25	1,090	B

SOURCE: PASTORIA ENERGY FACILITY AFC NOVEMBER, 1999, TABLE 5.11-1.

(1) Source: 1998 Traffic Volumes on the California State Highway System (Caltrans, 1999).

(2) Source: 1997 Truck Volumes on the California State Highway System (Caltrans, 1998).

(3) Percentages calculated using 1996 average daily truck traffic as a percentage of 1998 annual average daily traffic (AADT).
(4) Vphpd = vehicles per hour per direction, Source: Oputa 1999.
(5) Data not available from Caltrans, extrapolated from data on adjacent highway segments.
(6) Source: Oputa, 1999.

- Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate parking capacity.

TRAFFIC AND TRANSPORTATION Table 2
EXISTING TRAFFIC CHARACTERISTICS OF LOCAL ROADWAYS IN THE PROJECT AREA

Roadway	Location	Classification	Annual Average Daily Traffic (V)1	Annual Peak Hour Traffic(2)	Capacity (C)(3)	LOS (V/C)(4)
Edmonston Pumping Plant Road	**South of Plant Site**	**2-Lane local road**	**720**	**72**	**9,000**	**A**

Source: AFC Table 5.11-2.
(1) Edmonston Pumping Plant Road is a private road. Traffic count data is not available from the Kern County Roads Department (Hayslett, 1999). Based on a visual observation of traffic conducted 9/14/99, it is assumed that ADT for Edmonston Pumping Plant Road is 720 trips per day (average of 60 trips per hour x12 daytime hours).
(2) Based on 10 percent of AADT.
(3) Kern County, 1998.
(4) LOS calculated by dividing volume, V and capacity, C and then using the V/C ratio to define LOS (Kern County, 1998).

POWER PLANT

CONSTRUCTION PHASE

Construction of the generating plant facility will occur over an estimated 24-month period after the Notice to Proceed has been issued. The preferred commuting route, **TRAFFIC AND TRANSPORTATION Table 3, Preferred Commuting Routes** that workers will take to the project site will depend on the community from which they commute. No matter what community the individual commutes from, all persons going to the site will eventually merge onto I-5 and exit at the Edmonston Pumping Plant Road to get to the PEF. The commuting patterns indicated in Table 3 will result in increased traffic on local highways as a result of the construction workforce driving to the Project site. PEF, LLC assumes that the major portion of the anticipated workforce, 83 percent, will commute to the work site from Bakersfield, Delano, and McFarland by way of Highway 99 and Interstate 5.

The project will require a total construction workforce of 193 workers per month on average, assuming a single shift and a 40-hour five-day workweek. During the peak construction period (in the 17th month after the Notice to Proceed) an estimated 365 workers will be required at the plant site. Of the 365 workers, 350 are assumed to be local workers coming from the Bakersfield area and the remaining 15 will make up the non-local workforce commuting from Tehachapi and Southern California. **TRAFFIC AND TRANSPORTATION Table 4, Plant Construction Workforce Distribution** indicates the expected origin and distribution of the workforce that will be commuting to the plant site during construction.

TRAFFIC AND TRANSPORTATION Table 3
Preferred Commuting Routes

Commuting From	Percent of Workforce	Preferred Route
Bakersfield	69	Highway 99 south to I-5 south, and east on Edmonston Pumping Plant Road to the PEF
Delano and MacFarland	14	Highway 99 south to I-5 south, and east on Edmonston Pumping Plant Road to the PEF
Wasco and Shaffer	9	Highway 43 to Highway 99 south to I-5, and east on Edmonston Pumping Plant Road to the PEF
Taft and Maricopa	2	Highway 166 to Highway 99 south to I-5, and east on Edmonston Pumping Plant Road to the PEF
Arvin and Tehachapi	4	Highway 223 to Highway 99 south to I-5, and east on Edmonston Pumping Plant Road to the PEF
Southern California (Los Angeles Area)	2	Interstate 5 north and then east on Edmonston Pumping Plant Road to the PEF

Source: AFC Pg. 5.11-11.

TRAFFIC AND TRANSPORTATION Table 4
Plant Construction Workforce Distribution

Origin of Vehicle Travel to Pastoria Energy Facility Site	Distribution of Local Workforce	Average Local Workforce	Peak Local Workforce	Distribution of Non-Local Workforce	Average Non-Local Workforce	Peak Non-Local Workforce	Total Average Workforce (1)	Total Peak Workforce(2)
Bakersfield	69%	122	241	69%	11	10	133	251
Delano	11%	20	38	11%	2	2	21	40
Wasco	6%	11	21	6%	1	1	11	22
Arvin	4%	7	14	4%	1	1	8	15
McFarland	3%	5	11	3%	.5	.5	6	11
Shafter	3%	5	11	3%	.5	.5	6	11
Taft and Maricopa	2%	3.5	7	2%	.5	--	4	7.5
Other Areas Including Tehachapi and Southern California	2%	3.5	7	2%	.5	--	4	7.5
TOTAL	100%	177	350	100%	16	15	193	365

Source: AFC Table 5.11-3A.

(1) Sum of average local workforce and average non-local workforce.

(2) Sum of total peak local workforce and total peak non-local workforce.

TRAFFIC AND TRANSPORTATION Table 4 has been used to develop **TRAFFIC AND TRANSPORTATION Table 5, Plant Construction Vehicle Trip Generation** and Workforce Distribution that indicates the estimated vehicle trips to be generated by the construction workforce. Based on a worst-case scenario, it is assumed that on average each of the 193 workers would drive a separate vehicle to the project site, making two trips per day (one round trip from home to the site and back). This would result in approximately 386 total vehicle trips per day and at the peak construction period approximately 730 vehicle trips per day, **Table 5.**

TRAFFIC AND TRANSPORTATION Table 5
Plant Construction Vehicle Trip Generation and Workforce Distribution

Origin of Trip, Distribution To/From Pastoria Energy Facility Project Generating Plant Site	Average Workforce (1)	Average Vehicle Trips (2)	Peak Workforce	Peak Vehicle Trips
Bakersfield	133	266	251	502
Delano	21	42	40	80
Wasco	11	22	22	44
Arvin	8	16	15	30
McFarland	6	12	11	22
Shaffer	6	12	11	22
Taft and Maricopa	4	8	7.5	15
Other Areas Including Tehachapi and Southern California	4	8	7.5	15
Total	193	359	365	730

Source: AFC Table 5.11-3b.
(1) From Table 4, Total Average Workforce.
(2) From Table 4, Total Peak Workforce.

Using the travel pattern assumption described in **Table 5** the anticipated increase in traffic on local roads due to plant construction can be estimated. **TRAFFIC AND TRANSPORTATION Table 6, Distribution of PLANT Construction-Related Traffic on Highways** presents the expected increase in traffic on local roads and highways due to plant construction. During the peak construction period (assumed to be in the 17th month following the Notice to Proceed), construction related travel would affect Highways 99 and 223 the most. The resulting traffic increases on these roads during the peak month would be from 1 to 7 percent. Over the duration of construction project, the related increase in traffic for these roads will average 0.5 to 4 percent. Project related traffic is not expected to reduce the existing LOS on any of the highways in the project area, and therefore no impacts are anticipated to local highways.

The Edmonston Pumping Plant Road providing access to the project site, will be the most affected by the construction workforce traffic commuting to and from the project site. The traffic impacts are shown in **TRAFFIC AND TRANSPORTATION Table 7, Distribution of Plant Construction Related Traffic on Local Roads.** During the peak construction period, eastbound traffic on the Edmonston Pumping Plant Road from Interstate 5 will increase by 730-vehicle trips/day. This would result in a traffic increase of over 100 percent. Based on the average workforce along the Edmonston

Pumping Plant Road, construction traffic going east from Interstate 5 would be expected to increase by 386 vehicle trips per day. This represents an increase of 54 percent over the present traffic volume. The traffic increase will be most noticeable during the morning and evening peak commute hours, (between 6:00 a.m. and 7:00 a.m. in the morning and 4:00 p.m. and 5:00 p.m. in the evening). This increase in volume would be evident for most of the 24- month construction period.

Table 2 indicated that the Edmonston Pumping Plant Road has a capacity of 9,000 vehicles per day. The existing average daily traffic on the private road is estimated to be 60 trips per hour, which gives the road a LOS rating of A. Because of the low traffic level on this road, it can accommodate a large increase in construction traffic without significantly affecting its LOS rating. Therefore the peak-period traffic increases estimated for the Edmonston Pumping Plant Road will be greatly below its capacity and should not result in a significant adverse traffic impact. To reduce any potential problems that could be associated with the peak traffic conditions, the use of traffic mitigation measures have been proposed, (See **Mitigation**).

TRUCK TRAFFIC

Construction of the generating plant will require the use and installation of heavy equipment and associated systems and structures. Heavy equipment will be used throughout the construction period, including trenching and earthmoving equipment, forklifts, cranes, cement mixers and drilling equipment. In addition to deliveries of heavy equipment, construction materials such as concrete, wire, pipe, cable, fuels and reinforcing steel will be delivered to the site by truck. Deliveries will also include hazardous materials to be used during construction, such as gasoline, diesel fuel, oil, lubricants, solvents, adhesives, paint materials, and welding gases (i.e. acetylene and oxygen). Deliveries will occur between 7:00 AM and 5:00 PM on weekdays. It is expected that a majority of the equipment and materials will be transported from either Bakersfield or Los Angeles.

PEF estimates that 4,708 truck deliveries will be made to the plant site over the course of the 24-month construction period (on average approximately 196 truck deliveries per month). Assuming 20 average workdays per month and two trips for each truck delivery (one to and one from the site), the project will generate approximately 20 truck trips on average per day.

PEF has assumed that about 70 percent of the truck deliveries would originate in Bakersfield and drivers would use Highway 99 south to Interstate 5, south on I-5 to the Grapevine exit and then take **Edmonston Pumping Plant** Road to the PEF plant site. Truck deliveries from the Los Angeles area are assumed to be 20 percent. The drivers for these deliveries will use I-5 north exiting at the Grapevine exit and take the **Edmonston Pumping Plant** Road to the PEF plant site. The remaining truck deliveries are expected to originate north of Bakersfield. These deliveries will travel via highway 43 south to I-5, I-5 to the Grapevine exit and then take **Edmonston Pumping Plant** Road to the plant site.

TRAFFIC AND TRANSPORTATION Table 6
Distribution of Plant Construction-Related Traffic on Highways

Highway/Roadway	Existing AADT(1)	Existing LOS(1)	Projected Peak Vehicle Trips/Day	Peak Increase (%)	Projected Peak LOS	Average Vehicle Trips/Day	Projected Average Increase (%)
Interstate 5							
@ jct. Hwy 99 North	25,550	A	730 (1)	3%	A	386	2%
@ jct Hwy 166	23,900	C	15 (4)	0.06%	C	8	0.03%
@ jct Hwy 223	23,200	C	28 (3)	0.12%	C	17	0.07%
@ jct Hwy 119	23,600	C	28 (3)	0.12%	C	17	0.07%
@ jct Hwy 43	23,200	C	28 (3)	0.12%	C	17	0.07%
@ jct Hwy 58	24,100	C	28 (3)	0.12%	C	17	0.07%
Highway 33							
@ jct Hwy 166-East	4,400	C	15 (4)	0.3%	C	8	0.2%
@ jct Hwy 119-East	8,600	D	15 (4)	0.2%	D	8	0.09%
Highway 43							
@ jct Hwy 5	3,550	B	28 (3)	0.8%	B	17	0.5%
@ jct Hwy 58-East Rosedale Hwy	3,300	B	28 (3)	0.8%	B	17	0.5%
@ jct Hwy 58-East McKittrick Hwy	9,600	A	28 (3)	0.3%	A	17	0.2%
@ jct Hwy 43-West	7,200	C	44 (5)	0.6%	C	22	0.3%
@ jct Hwy 43-East	3,100	B	44 (5)	1%	B	22	0.7%
Highway 58							
@ jct Hwy 223-West	18,500	B	15 (6)	0.1%	B	8	1.04%
@ jct Hwy 202	19,500	B	15 (6)	0.08%	B	8	0.04%
Highway 99							
@ jct Hwy 5	26,500	B	730 (2)	3%	B	386	1%
@ jct Hwy 166	28,000	B	619 (7)	2%	B	328	1%
@ jct Hwy 223	32,500	B	619 (8)	2%	B	328	1%
@ jct Hwy 119	42,000	B	604 (8)	1%	B	320	0.8%
@ jct Hwy 58-East Rosedale Hwy	108,000	C	604 (8)	0.6%	C	320	0.3%
@ jct Hwy 58-East McKittrick Hwy	114000	D	604 (8)	0.5%	D	320	0.3%
Jct Rte 178 West							
@ jct Hwy 204	73,000	C	604 (8)	0.8%	C	320	0.4%
@ jct Hwy 65	59,000	C	604 (8)	1%	C	320	0.5%
@ jct Hwy 45	39,000	B	102 (9)	0.3%	B	54	0.1%
@ jct Hwy 45	36,000	B	80 (10)	0.2%	B	42	0.1%
Jct Rte 166							
@ jct Hwy 33 North	3,600	C	15 (3)	0.4%	C	8	0.2%
@ jct Hwy 5 Freeway	2,200	B	15 (3)	0.7%	B	8	0.4%
Jct Rte 223							
@ jct Hwy 5	680	B	45 (11)	7%	B	24	4%
@ jct Hwy 58	1,150	A	45 (11)	4%	A	24	2%

SOURCE: AFC Table 5.11-4.

1. See Table 1.
2. Assumes traffic from all directions.
3. Assumes traffic from Wasco and Shafter.
4. Assumes other areas of Kern County (including Taft and Maricopa).
5. Assumes traffic from Wasco only.

6. Assumes traffic from other areas of Southern California and Tehachapi.
7. Assumes traffic from Bakersfield, Delano, McFarland and other areas of Kern County.
8. Assumes traffic from Bakersfield, Delano, and McFarland.
9. Assumes traffic from Delano and McFarland.
10. Assumes traffic from Delano only.
11. Assumes traffic from Arvin and other areas of Southern California and Tehachapi.
12. Projected LOS estimated based on percentage peak increase. LOS calculations not available from Caltrans.

TRAFFIC AND TRANSPORTATION Table 7
Distribution of Plant Construction-Related Traffic on Local Roads

Local Road	Existing AADT	Projected Peak Vehicle Trips/Day	Peak Increases (%)	Projected Average Vehicle Trips/Day	Average Increase (%)
Edmonston Pumping Plant Road	720	730(1)	101	386(1)	54

Source: AFC Table 5.11-5.
(1) Assumes traffic from all directions.

The impact of construction truck traffic on the highways and local roads will vary. **TRAFFIC AND TRANSPORTATION Table 8, Distribution of Plant Construction Related Truck Traffic on Highways,** compares the plant construction truck traffic traveling to the site with existing automobile and truck traffic on the area highway system. The influx of 20 truck trips per day on the highways that are expected to be used for access to the site will be minimal compared to existing truck traffic. The increase will be between 0.003 to 0.3 percent in truck traffic depending on the route used. The impact of construction-related truck traffic on the highways will be insignificant.

Transportation of equipment that will exceed the load size and limits of certain roadways will require special permits. The procedures and processes for obtaining such permits are fairly straightforward. Mitigation measures and conditions of certification that ensure compliance with these requirements are discussed later.

Construction debris and small quantities of hazardous wastes will be generated during project construction as described in the **Waste Management Chapter** of this report. During construction, no more than several trucks per month will be required to haul waste for disposal. Transportation of hazardous materials to and from the project will be conducted in accordance with California Vehicle Code Section 31300 et seq.; Kern County does not have local ordinances regulating the transportation of hazardous materials. Because the transport of hazardous wastes will be conducted in accordance with transportation regulations governing such transport, and the roadways used to access the PEF present no specific safety concerns, no significant impact on traffic transportation is expected from the transportation of hazardous material.

TRAFFIC AND TRANSPORTATION Table 8
Distribution Of Plant Construction Related Truck Traffic On Highways

Highway	Existing AADT	Existing Truck AADT	Projected Average Truck Trips/Day (1)	Average Increase %
Interstate 5				
@jct. Grapevine	52,000	13,700	2(2)	0.03
@jct. Hwy 99	25,500	5,250	4(4)	0.02
@jct. Hwy 58	23,200	4,830	4(4)	0.02
Highway 99				
@jct. Hwy 5	2,650	6,240	7(4)	0.3
@jct. Hwy 223	32,500	6,840	1(3)	0.003
Highway 58				
@jct. Hwy	3,550	946	8(3),(4)	0.2

Source: AFC Table 5.11-6.

(1) Assumes an average of 435 truck deliveries each month, generating approximately 10 trick deliveries per day, i.e., 20 trips/day on average during construction period.
(2) Assumes 20 percent from Los Angeles area using I-5 north to project site.
(3) Assumes10 percent from north of Bakersfield using Highway 43 south to the I-5 to the site or I5 south to the site.
(4) Assumes 70% deliveries from Bakersfield using Highway 58 west to Highway 33 south.

All truck traffic will have to travel the Edmonston Pumping Plant Road to the plant access road. As shown in **TRAFFIC AND TRANSPORTATION Table 9, Distribution of Plant Construction-Related Truck Travel on Local Roads** the construction related truck traffic is expected to result in a 3 percent increase in truck traffic for this road. Due to the size and weight of the trucks, this increase in traffic may increase the wear on the road. There will be increased need for regular roadway inspection and maintenance to insure that safety standards are maintained. Staff has proposed a mitigation measure to ensure that damage to specific roadways, resulting from the Pastoria project, will be repaired by the project owner (see proposed Condition of Certification).

TRAFFIC AND TRANSPORTATION Table 9
DISTRIBUTION OF PLANT CONSTRUCTION-RELATED TRUCK TRAFFIC ON LOCAL ROADS

Local Road	Existing AADT	Project Average Truck Trips/Day	Average Increase (Percent)
Edmonston Pumping Plant Road	720	20	3.0

Source: AFC Table 5.11-3B.

RAILWAYS

PEF has indicated that whenever possible and cost effective, rail service will be used to transport heavy equipment and machinery to the Bakersfield area. The preferred rail line is the Union Pacific and Southern Pacific Railroad Company Arvin Branch. From the Arvin Branch Station the heavy equipment will be loaded onto trucks for transport to the PEF. These trucks will take State Highway 223 (Bear Mountain Boulevard) to the 99 Freeway south to I-5 and then to the PEF project site which is approximately 33 miles from the rail terminal.

OPERATIONAL PHASE

COMMUTE TRAFFIC

Potential long-term traffic impacts are associated with the facility's operational workforce. Operation of the generating plant will require a labor force of approximately 25 full-time employees. Assuming that each employee will drive a separate vehicle to work and that they will make one round trip from home to work per day, operation of the plant will generate approximately 50 vehicle trips per day. PEF has assumed that the majority of the permanent workforce will reside in Bakersfield. The preferred route for these employees to work will be southerly along Highway 99 to Interstate 5, then east on Edmonston Pumping Plant Road and then north on the plant access road to the Pastoria facility. The anticipated travel routes will accommodate the estimated operations related traffic. Adequate parking will be made available for employees on a paved lot adjacent to the administration building. The impact of operational traffic on the highways and roads is expected to be insignificant.

TRUCK TRAFFIC

Hazardous and non-hazardous materials as described in the AFC Waste Management and Hazardous Materials sections will be delivered by truck to the plant site on an incidental basis. None of the chemicals proposed for use at the PEF project site are Regulated Substances subject to the requirements of the California Accidental Release Prevention Program with the exception of aqueous ammonia. If a selective catalytic reduction system (SCR) is used for emissions control of oxides of nitrogen (NOx), then PEF will use aqueous ammonia (approximately 25 percent solution). This would result in approximately 11 truck deliveries per month of aqueous ammonia to the plant site when it is in operation. The anticipated travel routes for materials delivery will be along Highway 99 and/or Interstate 5.

The transportation and handling of hazardous substances associated with the project can increase road hazard potential. During project operation there will be about 11 truck deliveries per month of aqueous ammonia. Approximately once every ninety days, hazardous waste generated on site will be transported offsite by a licensed hazardous waste transporter. The handling and disposal of hazardous substances are addressed in the **Waste Management Chapter**.

PEF has proposed another process for the reduction of NOx that does not require the use of aqueous ammonia. If the SCR process were not used for emission control of NOx the aqueous ammonia would not be required.

LINEAR FACILITIES

Potentially affected roadways are those adjacent to or crossed by the proposed project linear components (i.e., transmission line, natural gas pipeline, and water supply and wastewater pipelines).

CONSTRUCTION PHASE

TRANSMISSION LINE

Potential impacts associated with the transmission line route include both construction and operation related impacts. Construction related impacts will result from the movement of heavy equipment, trucks, and worker vehicles along access routes during construction of transmission line towers and installation of conductors.

While this work will not directly impact traffic operations at nearby facilities (as staging areas will be established within the existing rights of way or adjacent to existing rights of way on separate property), traffic generated during construction may impact existing traffic levels. Several aspects of transmission line tower construction and conductor installation could potentially result in impacts. These include: 1) workforce related traffic; 2) access to proposed tower structure locations; 3) transmission line roadway crossings; and 4) construction equipment and materials deliveries. These issues are discussed below.

Construction of the transmission line along the route is anticipated to take 4 months and require approximately 30 workers per month during the surveying, site clearing, and grading. Construction activities associated with the transmission line, generating plant and pipelines will occur simultaneously during the 15th through 18th month following the Notice to Proceed. Construction of the transmission line will occur during the peak construction period.

PEF has assumed that the plant site staging area will also be used store equipment and materials and to provide field offices for the transmission line. Employees will report to the staging area at the beginning and end of each work day, then distribute themselves as needed to various work sites along the transmission line route. For these reasons and the proposed location of the related tower access, local roadways and highways will not be significantly impacted.

Construction of the transmission line will require the use and installation of heavy equipment, including various trucks (pickups, booms, cement and digger/auger), mobile cranes, a cable puller and a helicopter. An estimated 13 pieces of heavy equipment will be used during the transmission line's peak construction period.

In addition to deliveries of heavy equipment, construction materials such as tubular steel pole foundation sections, tubular steel poles, and consumables will be delivered by truck to the transmission line staging sites. It is estimated that these deliveries will start at 5 truck deliveries during month 15 and escalate to 25 truck deliveries during months 17 and 18. The delivery hours and origins are assumed to be the same as identified for the generating plant. In some cases, vehicles used to transport heavy machinery and construction material and equipment may require a transportation permit from Caltrans. Because of the small number of truck deliveries, construction materials and equipment for the transmission line, traffic impacts are expected to be insignificant.

Access to the tower structures for the transmission line will be along the existing access roads and pathways to the existing transmission line corridor. Transmission line construction will not adversely affect the existing roadways and will not result in any significant and transportation-related impact.

The transmission line route will cross the Edmonston Pumping Plant Road. The appropriate barricades and lights will be maintained at the road crossing in accordance with Caltrans, "Manual of Traffic Controls for Commission and Maintenance of Work Zones" and California Vehicle Code, Section 21400.

WATER SUPPLY LINE

The water supply line project will install a new pipeline from the plant site and connect to the Wheeler Ridge-Maricopa Water Storage District's water supply line northwest of the site. Potential traffic and transportation impacts associated with construction and operation of the water supply line would be similar to those identified for the transmission line, with the exception that no roadways will be crossed.

Construction of the water supply line is anticipated to occur during the 11th through 13th months following the Notice to Proceed. An average monthly workforce of 25 is estimated over the duration of pipeline construction. If each worker drove a separate vehicle making 2 trips per day, a total of 50 vehicle trips per day would occur during construction of the water supply line. The staging area for the pipeline will be located south of the plant site. Workers would report to this staging area at the beginning and the end of each work day, then distribute themselves as needed to various work sites along the pipeline route. Given the small size of the work force, no significant impacts are anticipated to local roadways and highways from construction worker traffic.

The water supply construction will require the use and installation of heavy equipment, including a plate compactor, portable equipment, generators, dump trucks, air compressors, dozers, excavators, 15-ton cranes, pick-up trucks and fuel trucks. An estimated 17 pieces of heavy equipment will be used during the water supply line's peak construction period, the 12th month following the Notice to Proceed.

In addition to the deliveries of heavy equipment, construction materials such as electrical equipment and supplies, piping, supports and valves, concrete and rebar, miscellaneous steel, consumables and other construction equipment will be delivered to the water supply line/pump station staging site by truck. An estimated maximum of 35 truck deliveries will be made to the staging sites over the course of construction (months 11 through 13). Delivery hours and origins are assumed to be the same as identified for the generating plant.

In some cases, vehicles used to transport heavy machine and construction materials and equipment will require a transportation permit from Caltrans.

Fuel Gas Supply Line

PEF has chosen a natural gas supply pipeline route that will connect to the Kern River-Mojave pipeline north of Sebastian Road. The proposed pipeline is approximately 11 miles long, of which 2.5 miles will be along Sebastian Road. Approximately eight miles of the pipeline route will be on the Tejon Ranch. While the pipeline is on ranch land the pipeline will cross no public highways or local roads. Equipment and workforce requirements for the construction of the natural gas fuel line are included in the estimates for the power plant. Construction of the pipeline will impact traffic on Sebastian Road as the applicant plans to locate the pipeline in road right of way. During construction at least one lane of access along Sebastian Road will be maintained. The low traffic volume on the roads along with the use of routine construction safety measures and compliance with encroachment permit requirements should result in minimal traffic impacts associated with construction of the pipeline.

When construction of the pipeline is occurring along Sebastian Road construction traffic will make use of the Laval Road entrance/exit. The exit has a LOS of C. The construction traffic associated with the pipeline should not be great enough to change the LOS for this exit.

Access Road

Construction of the PEF access road will occur on undeveloped Tejon Ranch land. The equipment and workforce required for the construction of the PEF access road are included in the estimates for the power plant. No road closure will be required during construction of the access road. Traffic impacts associated with construction of the access road will be insignificant.

CUMULATIVE IMPACTS

The analysis of the available capacity of the regional highways described in this section shows that the regional transportation system serving the Kern County area (along the potentially affected highways) has ample capacity to accommodate the proposed project's construction and operation generated traffic. Cumulative impacts could occur if construction of the PEF generating project were to overlap with proposed projects whose workforce and/or equipment and material deliveries were to concurrently travel the same local roadways.

The Kern County Planning Commission approved an application for a zoning change by the Tejon Industrial Complex, for 320 areas located on the west side of Interstate 5 at Laval Road. The zoning change was from light industrial to a medium industrial classification. The 320 areas will be developed for industrial and commercial uses. It is expected that the project would begin construction shortly after approval is received from the Kern County Planning Commission.

Construction of the PEF is anticipated to occur between the second quarter of 2001 and the second quarter of 2003, with peak activity occurring in 2002. Construction of the project natural gas pipeline could make use of the I-5 Laval Road exit/entrance. Construction of the pipeline is currently scheduled to occur between December 2001 and May 2002.

In addition to the Tejon Industrial Ranch project, the Petro Stopping Center is located on the west side of the Laval Road entrance/exit, and the Truck Stop of America and several other commercial establishments primarily dedicated to traveler service are located at the Grapevine entrance/exit of I-5. Construction of the PEF will increase traffic volumes at these intersections, the impact on traffic and transportation is not considered to be significant due to its temporary nature.

The Kern County Board of Supervisors adopted the San Midio New Town specific Plan on October 5, 1992. The Plan would include 9,447 acres of mixed-use development (residential and industrial). Located west of I-5 and southwest of Tejon Industrial Complex. This Plan may never be implemented because the water entitlements were lost and the Nature Conservancy owns a portion of the Plan area.

If construction of the Tejon Industrial Complex and/or the San Midio New Town were to coincide with both Caltrans improvements to the Laval Road exit/entrance to I-5 and construction of the project's fuel gas pipeline, impacts on traffic and transportation could occur. The impact would affect both the Laval Road and Grapevine exits/entrance of I-5. However, impacts would not be considered significant due to the temporary nature of the fuel gas pipeline construction period (6 months). If traffic congestion became a problem at the Laval Road exit during pipeline construction alternate exit off on Highway 99 could be used by the construction workforce. In addition, assessing the level of significance associated with this impact would be tentative at this time due to the uncertainty of final construction plans and schedules.

Caltrans is currently evaluating the need for improvement of the I-5/Laval Road intersection in response to the increase in traffic that would occur as a result of development of the Tejon Industrial Complex. No improvements are planned at this time

Traffic associated with operation of the proposed generating plant can be accommodated by the existing highway and roadway system. No impact from the plant operation are anticipated at the Laval Road exit/entrance to I-5 since plant workers will be arriving at the site using the I-5 to the Edmonston Pumping Plant Road exit. No significant cumulative traffic impacts are expected.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

PEF, LLC has stated its intention to comply with all federal LORS. Staff has proposed a condition of certification to ensure compliance. Staff believes such compliance will not present any unusual difficulties. The project is considered consistent with identified federal LORS.

STATE

PEF, LLC has stated its intention to comply with all state LORS. Staff has proposed a condition of certification to ensure compliance. Staff believes such compliance will not present any unusual difficulties. The project is considered consistent with identified state LORS.

LOCAL

PEF, LLC has indicated their intent to comply with the goals and policies of Kern County transportation and traffic system requirements. For operational employees, trip reduction measures could be employed, but since the maximum number of employees assigned to any one shift is 25, trip reduction measures are not necessary for this project.

FACILITY CLOSURE

INTRODUCTION

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

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 applicant will prepare a Facility Closure Plan for submittal to the Energy Commission for review and approval, at least twelve months prior to the proposed closure. 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.

UNEXPECTED TEMPORARY CLOSURE

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. From the perspective of traffic and transportation issues, in the event of temporary facility closure, the applicant would have to comply with all applicable policies contained in the LORS section of this report regarding transportation permits for hazardous materials and equipment.

UNEXPECTED PERMANENT 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. Staff assumes that the facility will either remain idle until such time that new ownership is established, or dismantling of the facility will occur. In any event, the owner will have to secure applicable transportation permits to satisfy the LORS requirements as stated in this report.

In the event of temporary closure, the effects on traffic and transportation would be similar to those for normal operation of the power plant facility. In the event of permanent closure, the effects would be similar to those associated with project construction. Permanent closure will involve a peak work period with commuter traffic. In either instance, the roadway systems within the vicinity of the project should be able to handle traffic without significantly affecting the current level of service of the area.

MITIGATION

The applicant has indicated its intention to comply with all LORS relating to: 1) the transport of oversized loads, 2) the transport of hazardous materials and 3) implementation of traffic control programs, if necessary, during the construction period. The applicant will implement the following measures if necessary to reduce traffic impact to the extent feasible.

(1) If warranted utilize proper signs and traffic control measures in accordance with Caltrans and Kern County requirements during peak traffic hours.

(2) Coordinate construction activities with appropriate County departments to maintain traffic flow and safety.

STAFF'S PROPOSED MITIGATION

Staff proposes mitigation measures to address the repair of roadway pavement due to truck traffic impacts during construction, and implementation of a traffic control plan. The applicant has proposed measures to reduce commuter traffic congestion during power plant construction with implementation of these mitigation measures, staff believes that project related impacts on traffic and transportation will remain less than significant.

CONCLUSIONS AND RECOMMENDATIONS

POWER PLANT

(1) The construction phase will cause increased roadway demand resulting from the daily movement of workers and materials, while noticeable, will not increase beyond thresholds established LOS requirements by local and regional authorities.

(2) During the construction phase, if increased commuter traffic on Edmonston Pumping Plant Road caused by the workforce results in some traffic congestion, PEF has stated it will work with Caltrans and the County to maintain traffic flow and safety. This would be done by utilization of proper signs and traffic control measures in accordance with Catrans and Kern County requirements during peak traffic hours.

(3) During the operational phase, increased roadway demand resulting from the daily movement of workers and materials will be minimal.

(4) All transportation and handling of hazardous substances can be mitigated to insignificance by compliance with federal and state standards established to regulate these substances.

LINEAR FACILITIES

1. Construction of the transmission lines will have minimal impacts on the function of area roadways. Routine construction safety measures should be sufficient to ensure no impacts.

2. Construction will require trenching within public road rights-of-way; the installation of underground facilities will impact both roadway function and levels of service. However, these impacts are expected to be short-term and not result in significant traffic and transportation impacts. PEF has indicated their intent to provide appropriate traffic control measures, and these are contained within the conditions of certification. In addition, all development will take place in compliance with California Department of Transportation (Caltrans) and Kern County limitations for encroachment into public rights-of-way.

Therefore, staff concludes that there will be no significant adverse impacts in the area of traffic and transportation as a result of the PEF project.

PROPOSED CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall comply with Caltrans and Kern County limitations on vehicle sizes and weights. In addition, the project owner or its contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for roadway use.

Verification: In the Monthly Compliance Reports, 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 Caltrans and Kern County limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans (for temporary signalization during construction at the intersection of Interstate5/Edmonston Pumping Plant Road if necessary) and all relevant jurisdictions.

Verification: In Monthly Compliance Reports, the project owner shall submit copies of any encroachment permits received during the reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS-3 The project owner shall ensure that permits and/or licenses are secured from the California Highway Patrol and Caltrans for the transport of hazardous materials.

Verification: The project owner shall include in its Monthly Compliance Reports, copies of all permits/licenses acquired by the project owner and/or subcontractors concerning the transport of hazardous substances.

TRANS-4 Prior to the start of construction, the project owner shall consult with Kern County, and prepare and submit to the Compliance Project Manager (CPM) for approval a construction traffic control plan and implementation program which addresses the following issues:

- Timing of heavy equipment and building materials deliveries;
- Redirecting construction traffic with a flagperson;
- Signing, lighting, and traffic control device placement if required;
- Need for construction work hours outside of peak traffic periods;
- Insure access for emergency vehicles to the project site;
- Temporary travel lane closure; and

- Access to adjacent residential and commercial property during the construction of the Fuel Gas Pipeline (Route 3).

Verification: At least thirty days prior to start of construction, the project owner shall provide to the CPM for review and approval and to Kern County for review and comment, a copy of its construction traffic control plan and implementation program. Prior to the start of construction the project owner shall provide a copy of Kern County's comments on the plan.

TRANS-5 The project owner or its contractor shall install crossing structures and netting across major thoroughfares as a safety precaution and to reduce the potential for damage from falling construction material or equipment during cable-stringing activities. Prior to start of construction, the project owner shall consult with Caltrans, and prepare and submit to the CPM a safety plan and implementation program.

Verification: At least 30 days prior to start of construction, the project owner shall provide to the CPM for review and approval, and a copy to Caltrans for review and comment a copy of its safety plan and implementation program for installing of transmission lines across roadways. Prior to the start of construction the project owner shall provide a copy of Caltrans' comments on the safety plan and implementation program.

TRANS-6 Following construction of the power plant and all related facilities, the project owner shall complete the repair of Edmonston Pumping Plant Road to original or as near original condition as possible.

Protocol: At least thirty days prior to start of construction, the project owner shall photograph Edmonston Pumping Plant Road between Interstate-5 and the plant entrance road, and that portion of Sebastian road where pipeline construction will occur The project owner shall provide the CPM and Kern County with a copy of these photographs.

Verification: Prior to the start of construction the project owner shall provide copies of the photographs taken of the Edmonton Pumping Plant Road and Sebastian Road. Within 30 days of the completion of project construction, the project owner shall meet with the CPM and Kern County to discuss appropriate road repairs. The project owner shall provide a copy of a letter from Kern County acknowledging satisfactory completion of the roadway repairs in the first Annual Compliance Report following start of operation.

Trans-7 Construction of the HRSG stacks shall have all the lighting and marking required by the FAA so that the stacks do not create a hazard to air navigation.

Protocol: Prior to start of construction the project owner shall submit to the Federal Aviation Authority Form 7460-1, Notice of Proposed Construction or Alteration.

Verification: Prior to the start of construction the project owner shall provide copies of the FAA Form 7460-1 filed with the regional FAA office to the CPM and Kern County Planning Department. Before the start of construction on the HRSG stacks, the project owner shall provide the CPM and Kern County Planning Department with copies of the FAA response to Form 7460-1 and supporting documents on how the project plans to comply with stack lighting and marking requirements imposed by the FAA.

REFERENCES

PEF (Pastoria Energy Facility) Application for Certification, Pastoria Energy Facility, L.L.C. (99-AFC-7). Submitted to the California Energy commission on November 30, 1999.

Jeff Sorenson, California Department of Transportation, office of Transportation Planning Comment letter on Pastoria Energy Facility traffic impact, Submitted to the California Energy Commission on April 7,2000.

Kern County Planning Commission, Regular Meeting March 9, 2000, Summary of Proceedings.

PEF Application for Certification, Pastoria Energy Facility, L.L.C. (99-AFC-7, Recommended Mitigation Measures and Draft Compliance Plans/Outlines. Submitted to the California Energy Commission on March 1, 2000.

Pat Madden, 2000. Edmonston Pump Plant. Telephone conversation with James Fore California Energy Commission, June 26, 2000.

Dave Rickles, Kern County Planning Department, Telephone conversation with James Fore California Energy Commission, July 6, 2000.

NOISE

Thomas M. Murphy

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 during which it is produced, and the proximity of the facility to any sensitive receptors combine to determine whether the facility will meet applicable noise control laws and ordinances, and whether it will exhibit significant adverse environmental impacts.

The purpose of this analysis is to identify and examine the likely noise impacts from the proposed Pastoria Energy Facility (PEF), and to recommend procedures to ensure that the resulting noise impacts will comply with applicable laws and ordinances, and will be adequately mitigated. This will enable the Energy Commission to make findings that:

- the PEF will likely be built and operated in compliance with all applicable noise laws, ordinances, regulations and standards (LORS); and

- the PEF will present no significant adverse noise impacts, or none that have not been mitigated to the extent feasible.

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 level exposure 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 offsite (community) noise.

STATE

Similarly, there are no state regulations governing offsite noise. Rather, state planning law (Gov. Code, § 65302) requires that local authorities such as counties or cities prepare and adopt a general plan. Government Code section 65302(f) requires that a noise element be prepared as part of the general plan to address foreseeable noise problems. In addition, Title 4, California Code of Regulations has

guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. The State land use compatibility guidelines are listed in Table 1 below.

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.

Other state LORS include the California Environmental Quality Act (CEQA) and California Occupational Safety and Health Administration (Cal-OSHA) regulations.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. The CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq., Appendix G, § XI) explain that a significant effect from noise may exist if a project would result in:

"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.

"d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project…."

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 described above.

LOCAL

KERN COUNTY GENERAL PLAN NOISE ELEMENT

Two policies enunciated in this noise element (Kern County, 1989) impact the construction and operation of a project such as the PEF. Policy (5) (a) prohibits new noise-sensitive land uses in noise-impacted areas unless effective mitigation measures are incorporated into project design to reduce exterior noise to 65 dB L_{dn} or less. Policy (5) (b) prohibits new noise-sensitive land uses in noise-impacted areas unless effective mitigation measures are incorporated into project design to reduce interior noise within living spaces or other noise sensitive interior spaces to 45 dB L_{dn} or less. It should be noted that there are no current noise ordinances in Kern County.

SETTING

PROJECT BACKGROUND

The PEF involves the construction and operation of a new 750 MW merchant-class electrical generating facility on an approximately 30-acre parcel of land that is owned by Tejon Ranch Company and committed by lease option to PEF, LLC. The proposed plant is conceptualized as three large F-Class combustion turbine generators (CTGs) operating in combined cycle mode. Two CTGs would be installed in a “two-on-one” configuration with one steam turbine generator (STG). The other CTG would be installed in a “one-on-one,” non-common shaft configuration with one STG. All three CTGs are single-fueled natural gas-fired.

The Applicant would also construct a 16- to 24-inch diameter natural gas fuel transmission pipeline, which would connect the PEF with the 42-inch diameter Kern River-Mojave transmission pipeline. The Applicant has identified a route for a 11.7 mile pipeline to connect to the Kern River-Mojave transmission pipeline. In addition to the natural gas pipeline, the Applicant proposes to construct a transmission line, a water pipeline and an access road to the site.

EXISTING LAND USE

The PEF will be located in the unincorporated area of the County of Kern, just north of the Tehachapi Mountains and approximately 6.5 miles east of Grapevine, California. This facility site, zoned for Exclusive Agriculture, is authorized under the Kern County General Plan land use designations as “Intensive Agriculture” and “Mineral and Petroleum”. Existing land uses within the study area consist of undeveloped and agricultural lands, gravel pits, oil wells and fields, and the California Aqueduct (Kern County, 1994). Residential uses are the nearest sensitive receptors; they are located approximately 4.4 miles northeast of the project site adjacent to Laval Road, and 5.4 miles northeast of the proposed plant site, within an agricultural activity support area known as Lower Citrus. The Laval Road location has about a dozen residences, while the Lower Citrus area contains four adjacent residential units housing twelve permanent occupants. The fuel gas pipeline route is located near several scattered rural residential uses along Sebastian Road.

EXISTING NOISE LEVELS

In order to predict the likely noise effects of the PEF on these sensitive receptors, the Applicant commissioned an ambient noise survey of the area. This survey was performed using typical monitoring and analysis equipment and methods.

The Applicant’s noise survey monitored noise levels at 10 locations. Long-term measurements were taken near residences at Lower Citrus agricultural activitiy area, and at the intersection of Sebastian Road and Mazzie Road. The monitor at the Lower Citrus area measured hourly average noise levels during a continuous

25-hour time period. The monitor at Sebastian Road at Mazzie Road east of Rancho Road provided noise data during a continuous 24-hour time period. In addition to the long-term measurements, eight short-term (10 minute) measurements were taken at various locations (e.g., site boundary, Laval Road, David Road, Sebastian Road) throughout the study area (PEF 1999a, AFC § 5.12.1.3). The eight short-term measurements were conducted during random morning, midday, and afternoon hours.

Survey results indicated that the ambient noise level near the proposed PEF site and throughout the general area is influenced primarily by the mining machinery and transportation activities associated with the nearby mining operation. Other background noise contributions came from motor-vehicle traffic, agricultural operations, and industrial activities in the area. The ambient noise level at the closest receptor along Laval Road (4.4 miles northeast of the proposed site) was 41.4 dBA Leq. The next closest at the Lower Citrus agricultural activity area (5.4 miles northeast of the PEF) had a noise level of 40.1 dBA Leq. Noise levels at residences located Sebastian Road are 53.8 Leq. Higher noise levels recorded along Sebastian Road were due to farm machinery and aircraft, transport trucks, school buses, and light-duty trucks/automobiles. Measured noise levels at each of the four PEF site boundaries were approximately 39 dBA Leq (PEF 1999a, AFC § 5.12.13).

IMPACTS

Project noise impacts can be created by construction, and by normal operation of the power plant.

PROJECT SPECIFIC IMPACTS — CONSTRUCTION

COMMUNITY EFFECTS

Construction noise is a temporary phenomenon; the construction period for the PEF is scheduled to last 24 months (PEF 1999a, AFC § 3.8.1). 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. It should be noted that there are no specific LORS limiting construction noise in Kern County.

The Applicant has predicted the noise impacts of project construction on the nearest sensitive receptors (PEF 1999a, AFC § 5.12.2.2). If all the equipment in Table 5.12-5 of the AFC were to operate simultaneously at maximum power, a total noise level of approximately 89 dBA would occur at a distance of 50 feet from the acoustic center of the construction activity. Noise levels at the nearest residence (to the north) are projected to reach approximately 36 dBA for most work; this compares to the ambient background noise levels here of 40.4 dBA. Noise levels would not be noticeable based on the noise survey results.

The gravel extraction operations adjacent to the PEF would be considered an Insensitive Use (see Table 2), with Kern County Noise Standards of 65 dBA L_{50} daytime and 60 dBA L_{50} nighttime. These standards would apply to the boundary line between the project and the adjacent gravel extraction operation. It should be noted that the nighttime standard should not be applied to this project because the sand and gravel operations do not operate at night and the property is not occupied at night. Further, the 65 dBA L_{50} daytime level would not be appropriate for this gravel operation because the on-site noise levels generated by the sand and gravel operations are routinely in the 80+ dBA range. In addition, the personnel at the gravel extraction company are required to wear personnel protective equipment or are working within an enclosed structure.

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. High pressure steam is 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, is 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 steam blows can produce noise as loud as 130 dBA at a distance of 100 feet. This would attenuate to about 83 dBA, an exceedingly disturbing level, at the nearest residence, 23,400 feet distant (PEF 1999a, AFC § 5.12.4.3). In order to minimize disturbance from steam blows, the steam blow piping can be equipped with a silencer that will reduce noise levels by 20 to 30 dBA, or to a level of 53 to 63 dBA at the nearest residence. This is still an annoying noise level; staff proposes that any high pressure steam blows be muffled with an appropriate silencer, and be performed only during restricted daytime hours (see proposed Condition of Certification **NOISE-4** below) in order to minimize annoyance to residents.

Alternatively, the Applicant may elect to employ a new, quieter steam blow process, variously referred to as QuietBlow™ or Silentsteam™. This method utilizes lower pressure steam over a continuous period of approximately 36 hours. Resulting noise levels reach only about 80 dBA at 100 feet; noise levels at the nearest residence would thus be about 32 dBA, lower than the ambient background noise levels.

Regardless which steam blow process the Applicant chooses, staff proposes a notification process (see proposed Condition of Certification **NOISE-5** below) to make neighbors aware of impending steam blows. This should help ensure the process is at least tolerable to residents.

LINEAR FACILITIES

Construction of the 12- to 16- inch diameter gas line, the water line, electric interconnection lines, and the access road will produce noise. This noise will be noticeable, and possibly annoying, to persons outside their homes at those residences nearest the construction area. This work, however, is only a temporary phenomenon; the work will progress at such a pace that no single receptor will be inconvenienced for more than a few days. In addition, such work is customarily performed during the daytime, and would cause no impacts at night, when quiet is most important. While no LORS are in effect to assure daytime-only construction, staff has proposed a noise complaint process (see proposed Conditions of Certification **NOISE-1**, **NOISE-2** and **NOISE-8**, below) that will allow any person suffering annoyance to address the problem with the Applicant. Staff believes no significant adverse noise impacts are likely to occur due to the construction of the linear facilities.

WORKER EFFECTS

The Applicant does not specifically acknowledge the need to protect construction workers from noise hazards. The Applicant does, however, recognize those applicable LORS that will protect construction workers, and commits in general to complying with them (PEF 1999a, AFC § 5.12.4.1, 5.12.4.2). To ensure that construction workers are, in fact, adequately protected, staff has proposed a Condition of Certification (**NOISE-3**, below).

PROJECT SPECIFIC IMPACTS — OPERATION

COMMUNITY EFFECTS

The Applicant commits to incorporating noise mitigation measures into the design of the project that will ensure that noise levels at the nearest receptor (23,400 feet in distance) will be below 45 dBA (PEF 1999a, AFC § 5.12.3). The noise impact calculations in the AFC indicate that the normal operating noise level from the proposed power plant would be approximately 37 dBA L_{dn} at the closest residential receptor, which is well below the Kern County maximum allowable noise level of 45 dBA L_{dn} (PEF 199a, AFC § 5.12.2.1). At the next closest (rural residential) land use, the predicted noise level would be approximately 35 dBA L_{dn}, which is also well below the allowable level.

POWER PLANT OPERATION

During its operating life, the PEF will represent essentially a steady, continuous noise source day and night. Occasional short-term increases in noise level will 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 will decrease.

The Applicant modeled facility noise emissions using predictive software. Noise modeling was conducted to predict the environmental noise emissions during normal, steady state conditions. The model simulates the outdoor propagation of sound from each point source and accounts for divergence, atmospheric sound absorption and sound attenuation. All equipment sound levels were based on standard manufacturer performance data or empirical formulae as outlined in the Electric Power Plant Environmental Noise Guide by Edison Electric Institute (EEI, 1984).

The primary noise sources anticipated from the proposed facility include the heat recovery steam generators, the combustion turbine generator packages, the steam turbine generators, the cooling towers, boiler feed pumps, the generator step-up transformers, and the circulating water pumps. Secondary noise sources are anticipated to include pumps, ventilation fans and compressors. The noise emitted by power plants during normal operations is generally broadband, steady state in nature.

As described above, the modeled noise level at the closest residential receptor associated with the PEF was determined to be 30 dBA L_{50} and 37 dBA L_{dn} (PEF 1999a, AFC § 5.12.2.1). These noise levels would obviously be inaudible compared to the existing ambient noise environment. See Figure 5.12-2 of the AFC.

TONAL AND INTERMITTENT NOISES

One possible source of annoyance would be strong tonal noises, individual sounds that, while not louder than permissible levels, stand out in sound quality. To ensure the avoidance of such tonal sound, the noise control design of the PEF can be balanced to bring as many noise sources as possible to the same relative sound level, causing them all to blend without any one source standing out. Another potentially annoying source of noise from a combined cycle power plant is the intermittent or occasional actuation of steam relief valves. The hissing noise from these valves can be largely mitigated by the installation of adequate mufflers. To ensure that adequate measures are taken to mitigate tonal and intermittent noise sources, staff has proposed measures (see proposed Condition and Certification **NOISE-6**, below) to ensure that tonal and intermittent steam relief noises are not allowed to cause a problem.

LINEAR FACILITIES

There are a number of linear facilities associated with the proposed PEF. The proposed facility would require a water supply pipeline (0.2 miles in length), and a fuel gas pipeline (11.65 miles). Both pipelines would be buried below ground and would not produce any audible noise. Thus, there will be no noise impacts associated with the pipelines.

In addition to the pipeline, the proposed facility would require a transmission line south of the property. Noise sources associated with power transmission include occasional breaker operation in the switchyard, and corona noise and very low magnetostriction hum from the conductors. Breaker noise is considered impulsive in nature, lasting a very short duration, and may occur only a very few times per year. Corona noise is characterized as a buzz or hum and is usually worse when the conductors are wet, such as in rain or fog. No significant noise impact will occur because the transmission line and switchyard would not be located near noise-sensitive land uses.

Worker Effects

The Applicant recognizes the need to protect plant operating and maintenance personnel from noise hazards, and commits to comply with applicable LORS (PEF 1999a, AFC § 5.12.4.1, 5.12.4.2). Areas of the plant with noise levels exceeding 85 dBA (the level below which OSHA does not recognize a threat to workers' hearing) will be posted and hearing protection required. Additionally, a hearing conservation program would be implemented. To ensure adequate protection of workers, staff had proposed a Condition of Certification (**NOISE-7**, below).

CUMULATIVE IMPACTS

Section 15130 of the *CEQA Guidelines* requires a discussion of cumulative environmental impacts when they are evaluated as being significant. Cumulative impacts are defined as those impacts that are created as a result of the combination of the project evaluated in the EIR together with other projects causing related 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 proposed project alone.

The *CEQA Guidelines* also mandate two different ways in which cumulative impacts are to be evaluated. One of these mandated approaches is to summarize growth projections in an adopted general plan or in a prior certified environmental document. The second method involves compilation of 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.

There are several construction projects planned for the region around the PEF, including the Tejon Industrial Complex, residential and industrial development described in the San Midio New Town Specific Plan, and State Route 223 improvements (PEF1999a, AFC § 5.18.2). It should be noted that these projects may be constructed at the same time as the PEF. However, based on the distance these projects are from the proposed PEF, no cumulative noise impacts would occur during the construction or operation of the proposed power plant.

FACILITY CLOSURE

Upon closure of the facility, all operational noise will cease; no further adverse impacts from operation will be possible. The remaining potential noise source will be that caused by dismantling of the structures and equipment, and any site

restoration work that may be performed. Since this noise will be similar to that caused by the original construction of the PEF, 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 then in existence would apply; applicable Conditions of Certification included in the Energy Commission Decision would also apply unless properly modified.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that the PEF will likely be built and operated to comply with all applicable noise laws, ordinances, regulations and standards. Staff further concludes that the PEF, mitigated as described above, will likely present no significant adverse noise impacts. The PEF will likely represent an unobtrusive, nearly undetectable component of ambient noise levels.

RECOMMENDATIONS

Staff recommends that the following proposed Conditions of Certification be adopted to ensure compliance with all applicable noise LORS, and implementation of the Applicant's proposed mitigation measures.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 At least 15 days prior to the start of rough grading or trenching, the project owner shall notify all residents and business owners within one-half 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 rough grading or trenching 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 for example), 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 30 days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with the Kern County Environmental Health Services 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 30-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is finally implemented.

NOISE-3 Prior to the start of project construction, 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 rough grading or trenching, 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 110 dBA measured at a distance of 100 feet. The project owner shall conduct 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 hours of execution, to 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 blow(s), the project owner shall notify all residents or business owners within one-half mile of the site of the planned steam blow 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 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 five (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 blow activities, including a description of the method(s) of that notification.

NOISE-6 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, utilizing the same monitoring sites employed in the pre-project ambient noise survey as a minimum. The survey shall also include the octave band pressure levels to ensure that no new pure-tone noise components have been 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. If the results from the survey indicate that the project noise levels are in excess of 70 dBA at the PEF property boundary, additional mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

Verification: Within 30 days after completing the survey, the project owner shall submit a summary report of the survey to the Kern County Environmental Health Services Department, and to the CPM. Included in the 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 30 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 The project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted within 30 days after the facility is in full operation, and 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 work (that which causes offsite annoyance, as evidenced by the filing of a legitimate noise complaint) shall be restricted to the times of day delineated below:

High-pressure steam blows:	8 a.m. to 5 p.m.
Other noisy work	7 a.m. to 10 p.m.

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

Pastoria Energy Facility
(99-AFC-7)

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).

REFERENCES

Barnes, J.D., L.N. Miller, and E.W. Wood. 1976. Prediction of Noise from Power Plant Construction. Bolt Beranek and Newman, Inc., Cambridge, Massachusetts. Prepared for Empire State Electric Energy Research Corporation, Schenectady, New York.

Beranek, L.L., I.L. Ver. 1992. *Noise and Vibration Control Engineering:Priniciples and Applications*. John Wiley and Sons, August.

Cunniff, Patrick F., *Environmental Noise Pollution*. John Wiley & Sons, 1992.

DHS (California Department of Health Services), Office of Noise Control. *Model Community Noise Control Ordinances*, 1977.

Edison Electric Institute. *Electric Power Plant Environmental Noise Guide*, 1984.

Kern County. 1989. Kern County General Plan, Noise Element. December.

Kryter, Karl D. *The Effects of Noise on Man*. Academic Press, N.Y., 1970.

Office of Planning and Research. 1990. State of California General Plan Guidelines. June.

Miller, L.N., E.W. Wood, RM. Hoover, A.R. Thompson, and S.L. Paterson. 1978. Electric Power Plant Environmental Noise Guide, Volume 1. Bolt Beranek and Newman, Inc., Cambridge, Massachusetts. Prepared for Edison Electric Institute, New York, New York.

PEF (Pastoria Energy Facility) 1999a. Application for Certification, Pastoria Energy Facility (99-AFC-7), Volumes 1and 2. Submitted to the California Energy Commission, November 30, 1999.

SCE (Southern California Edison/Vartania) 1999a. System Impact Study. Submitted to the California Energy Commission on December 31,1999.

PEF (Pastoria Energy Facility). 2000a. Response to CEC Data Adequacy Comments Dated December 29, 1999 (Supplement to AFC). Submitted to the California Energy Commission, January 5, 2000.

PEF (Pastoria Energy Facility/Scholl) 2000a. Response to CEC Data Requests (First Data Response submittal). Submitted to the California Energy Commission, March 13, 2000.

Peterson and Gross (Peterson, Arnold P. G. and Ervin E. Gross, Jr.). *Handbook of Noise Measurement*, 7th ed. GenRad, Concord, MA., 1974.

Smith, B.J., R.J. Peters, S. Owens. 1996. Acoustics and Noise Control, 2nd Edition. Addison-Wesley. November

U.S. EPA. 1971. *Noise from Construction Equipment and Operations*. Prepared by Bolt et al. Beranek, and Newman, Boston, MA. December

U.S. EPA. 1971. *Community Noise*. Washington D.C., December

U.S. EPA. 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. 550/9-74-004. U.S. Environmental Protection Agency, Office of Noise Abatement and Control. Washington, DC.

U.S. EPA . 1978. *Protective Noise Levels, (Condensed Version of EPA Level Document)* (No. PB82-138827).

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. 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 day and night levels with a nighttime increase 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. In wilderness area, the Ldn noise levels average approximately 35 dBA , 50 dBA in small towns or wooded residential area, 65 to 75 dBA in major metropolis downtown (e.g., Los Angeles), and 80 to 85 dBA near freeways and airports. 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 area 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 area 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 dBA levels.

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, dB	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.
L10, L50, & L90	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L90 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 5 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}	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.
Source: California Department of Health Services 1976.	

NOISE: Table A2 Typical Environmental and Industry Sound Levels			
Source and Given Distance from that Source	A-Weighted Sound Level in Decibels (dBA)	Environmental Noise	Subjectivity/ Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		
Very Loud Music	110	Rock Music Concert	Very Loud
Pile Driver (50')	100		Very Loud
Ambulance Siren (100')	90	Boiler Room	Very Loud
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	Quiet
Large Transformer (200')	40		
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 3-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 10-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 6 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

VISUAL RESOURCES

Gary D. Walker

SUMMARY

Energy Commission staff analyzed both the potential visual impacts of the proposed Pastoria Energy Facility (PEF) and the compliance of the project with applicable laws, ordinances, regulations, and standards. Staff concludes that the project's impacts on visual resources would not be significant with the possible exception of the impacts due to vapor plumes from the Heat Recovery Steam Generator (HRSG) exhaust stacks. Staff proposes that the applicant provide additional information on this topic. Staff also concludes that the project would comply with applicable laws, ordinances, regulations, and standards.

INTRODUCTION

Visual resources are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether PEF would cause significant adverse visual impacts and whether the project would be in conformance 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) Public Resources Code section 21000 et seq. and Title 20, California Code of Regulations, section 1701 et seq.1. The determination of the conformance of the proposed project with applicable laws, ordinances, regulations, and standards is required by Public Resources Code section 25525.

ORGANIZATION OF ANALYSIS

This analysis is organized as follows:

- Description of analysis methodology;
- Description of applicable laws, ordinances, regulations and standards;
- 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;
- Conclusions; and
- Recommendation 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.

1 The California Energy Commission's power plant siting regulations.

ANALYSIS METHODOLOGY

Visual resources analysis has an inherent 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 defines 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 which 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 Applicable 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, e.g., Smardon 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 visible exhaust plume?

VIEW AREAS AND KEY OBSERVATION POINTS

The proposed project is visible from several areas. Energy Commission staff evaluated the visual impact of the project from each view of these areas. Staff used Key Observation Points[2], or KOPs, as locations in each of these areas for photographs of the existing setting and visual simulations of the setting with the proposed project. Although the KOPs are generally representative of each view area, they are not the only location that staff considered in each view area.

EVALUATION PROCESS

For each viewing area, staff considered the existing visual setting and the visual changes that the project would cause to determine impact significance. Energy Commission staff conducted a site visit and verified that the view areas and KOPs are appropriate for this analysis.

ELEMENTS OF THE VISUAL SETTING

To assess the existing visual setting, staff considered the following elements:

Visual Quality

Visual quality is the value of visual resources. 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).

Visual Sensitivity

Visual sensitivity is a measurement of the level of interest or concern of viewers regarding the visual resources in an area. Official statements of public values and

[2] 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.

goals reflect viewers' expectations regarding a visual setting. This analysis also employed land use as an indicator of viewer sensitivity. Uses associated with 1) designated parks, monuments, and wilderness areas, 2) scenic highways and corridors, 3) recreational areas, and 4) residential areas are considered to be highly sensitive. Agricultural areas are considered to have moderate visual sensitivity. Travelers on other highways and roads, including those in agricultural areas, are considered to have moderate sensitivity. Commercial uses, including business parks, are generally moderately sensitive, but some commercial developments have specific requirements related to visual quality, such as landscaping, building height limitations, building design, and prohibition of above-ground utility lines, that indicate high visual sensitivity. Large-scale industrial uses are typically the least sensitive because workers are focused on their work, and generally are working in surroundings with relatively low visual value.

Visibility

Visibility can differ substantially between view locations, depending on screening and the angle of view. The smaller the degree of screening, the higher a feature's visibility is. The closer the feature is to the center of the view area, the greater its visibility is. Visibility is also reduced by distance.

Viewer Exposure

The exposure of viewers to a view is affected by the number of viewers, the duration of the view, and the distance. Viewer exposure can range from having high values for all three factors, such as a foreground view from a large number of residences, to having low values for all three factors, such as a brief background view for a few travelers.

Visual Susceptibility

The level of susceptibility of a view area to impacts due to visual change depends on visual quality, viewer sensitivity, visibility, and viewer exposure.

TYPES OF VISUAL CHANGE

To assess the visual changes that the project would cause, staff considered the following factors:

Dominance

One measure of visual change is *scale dominance* - the apparent size of an object relative to the visible expanse of the landscape and to the total field of view. Another measure of change is *spatial dominance* - the measure of the dominance of an object due to its location in the landscape. The level of dominance can range from subordinate to dominant.

Contrast

Visual contrast was evaluated in regard to the elements of color, form, line, and scale.[3] The degree of contrast can range from high to low.

View Blockage

View blockage is the blockage from view by the project of any previously visible components. Blockage of higher quality visual elements by lower quality elements causes adverse impacts. The degree of view blockage can range from strong to none.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL AND STATE

The proposed project, including the linear facilities, is located on private lands and is thus not subject to federal land management requirements. Likewise, no roadway in the project vicinity is a designated or eligible State Scenic Highway. Therefore, no federal or state regulations pertaining to scenic resources are applicable to the project.

LOCAL

The proposed power plant and linear facilities would be located in Kern County.

KERN COUNTY

Kern County has no specific policies on visual or aesthetic resources that apply to the PEF. However, these topics are addressed in the Kern County General Plan, Open Space Element, and are implemented by the Kern County Planning and Development Services Department (Kern County, 1994).

PROJECT DESCRIPTION

The following section describes the aspects of the project that may have the potential for significant visual impacts. These facilities include the power plant, an electric transmission line, a fuel gas pipeline, a water supply pipeline, a construction laydown area, and an access road.

POWER PLANT

The proposed power plant site is approximately 4,300 feet north of Edmunston Pumping Plant Road and approximately five miles east of Interstate 5 (I-5) (see **PROJECT DESCRIPTION Figure 1**). The most visually prominent elements of the power plant would be the three 70-foot-tall heat recovery steam generators (HRSGs); the three HRSG stacks, which would be 213 feet tall or less, and the two wet cooling tower banks, which would be 64 feet tall. The remaining power plant

[3] Scale contrast is the scale of an object relative to other distinct objects or areas in the landscape.

facilities would range from 10 to 40 feet tall (PEF 1999a, p.5.13-4). Materials and color of the project structures had not been determined at the time of AFC preparation. However, the AFC assumes that the facilities would be beige (PEF 1999a, p.5.13-4), earth-tone tan or gray (PEF 1999a, p.5.13-19), as illustrated in **PROJECT DESCRIPTION Figure 3**. The 25-acre construction laydown area would be adjacent to the south side of the power plant site.

ELECTRIC TRANSMISSION LINE

The electricity generated at the power plant would be transmitted over a 1.38 mile long double circuit 230 kV line that would run west to a point near existing Southern California Edison transmission lines and then south for approximately one mile to the Pastoria Substation (see **PROJECT DESCRIPTION Figure 2**). The line would be placed on new lattice steel towers, approximately 100 to 120 feet tall (see **VISUAL RESOURCES Figure 5**). The conductors would have a non-specular finish to reduce reflectivity (PEF 1999a, p.5.13-4).

FUEL GAS PIPELINE

PROJECT DESCRIPTION Figure 2 shows the proposed route for the 11.65 mile long fuel gas pipeline. The proposed connection point is approximately 6.5 miles north of the proposed plant site. The diameter of the pipeline would be 16 inches for part of the route and 20 inches for the remainder of the route.

WATER PIPELINE

PROJECT DESCRIPTION Figure 2 shows the route of the proposed water supply pipeline. The route runs approximately 0.2 miles west from the plant site to the route for the proposed Wheeler Ridge – Maricopa Water Storage District 54-inch diameter pipeline.

The applicant proposes to use a zero liquid discharge system (PEF/Parquet 2000a), so no wastewater line is needed.

Because the water supply pipeline would be buried and would not be visible to public view, it would not cause any significant visual impacts and it is not addressed further in this analysis.

CONSTRUCTION LAYDOWN AREA

PROJECT DESCRIPTION Figure 2 shows the location of the proposed 25-acre construction laydown area. The laydown area would be immediately south of the proposed power plant site.

ACCESS ROAD

PROJECT DESCRIPTION Figure 2 shows the location of the proposed 24-foot wide all-weather surface access road. This 0.85 mile long road would connect the power plant site to Edmunston Pumping Plant Road.

SETTING

REGIONAL SETTING

The PEF would be located at the southern end of the San Joaquin Valley, at the foot of the Tehachapi Mountains (see **PROJECT DESCRIPTION Figure 1**). The valley floor is almost flat with only a slight upward tilt to the south and east, and the mountains rise dramatically above it, providing a striking contrast in terrain and the dominant feature in the landscape. Most views are open and panoramic. Streams in the region are ephemeral. The most prominent water feature in the area is the California Aqueduct south of the plant site, but most views of the canal from the valley floor are primarily of the canal banks, not the water. The mountains appear devoid of human alteration except for Interstate 5 (I-5), which climbs over them to the south. Grazing lands characterize the narrow band of transitional foothills. Irrigated cropland and grazing land are the primary visual elements on the valley floor. Some portions of the southeastern edge of the valley have also been used for oil production, evidenced by scattered oil extraction facilities (see **VISUAL RESOURCES Figure 4a)**. Several electric transmission lines on steel lattice towers cross the valley, but they are subordinate from most of the area due to its vast scale. A number of distribution lines on smaller wood poles line many of the local roads and are more prominent than the transmission lines from most of the area due to their proximity.

PROJECT AREA SETTING

POWER PLANT VIEWSHED

VISUAL RESOURCES Figure 1 shows the area from which the proposed power plant would be visible, also called the viewshed. Because of the relatively flat valley floor, most views toward the power plant site from as much as ten miles away are not blocked by terrain. However, many of these views are blocked by vegetation, especially orchards. In addition, visibility is attenuated with increasing distance, particularly at times of the year when haze or fog occur. Vapor plumes from the project, which would extend above the tallest project structures, could be seen from greater distances than the power plant structures, particularly on clear days.

POWER PLANT VICINITY

The PEF power plant site and construction laydown area are located at the base of the Tehachapi Mountains, in an unincorporated area of Kern County. The site slopes downward slightly to the north. The vicinity is rural. Most of the land is used for grazing. A quarry is located just southeast of the site. Two electric transmission lines run north to south approximately 1/3 mile to the west of the power plant site. The California Aqueduct is approximately one mile south of the site. Edmunston Pumping Plant Road runs along the north side of the aqueduct. Although this road is accessible to the public, it is a private dead-end road that leads only to the Edmunston Pumping Plant.

ELECTRIC TRANSMISSION LINE ROUTE

The proposed electric transmission line route travels west then south to the Pastoria Substation. The gently rolling terrain slopes up from the power plant site toward the substation. Terrain partly screens the substation from view from Edmunston Pumping Plant Road. The transmission line route crosses the road just north of the substation.

WATER PIPELINE ROUTE

The short water pipeline route is within the power plant vicinity, described above.

FUEL GAS SUPPLY PIPELINE ROUTE

The proposed fuel gas supply pipeline route extends northeast from the power plant site across gently rolling terrain. The route then turns north to generally follow the base of the Tejon Hills on the east side of the valley. This portion of the route follows existing farm and fire roads and crosses open grasslands and areas of oil extraction activity on Tejon Ranch where public access is restricted. The route diverges from the Tejon Hills to meet the eastern terminus of Sebastian Road (see **VISUAL RESOURCES Figure 4c**), and follows the road west to just past Rancho Road (see **VISUAL RESOURCES Figure 4b**), where it turns north to connect with an existing natural gas pipeline. The landscape along Sebastian Road is comprised of agricultural fields, orchards, and occasional oil extraction facilities.

VIEW AREAS AND KEY OBSERVATION POINTS

Staff evaluated the project from three view areas. **VISUAL RESOURCES Figure 2** shows the location of the KOPs used to represent these areas and the direction of view from each KOP.

EDMUNSTON PUMPING PLANT ROAD

The closest view area accessible to the public is along Edmunston Pumping Plant Road approximately 1.1 mile (6,000 feet; PEF/Thompson 2000f, Data Response No.37). This location was chosen because it is the only area accessible to the public where the power plant components, electric transmission line, and access road would be readily visible. KOP 1 is located at the point on the road that is closest to the power plant site, which is approximately one mile to the north (see **VISUAL RESOURCES Figure 2**). From this view area the view toward the proposed power plant site is of the southern end of the San Joaquin Valley, with the Tejon Hills and the Tehachapi Mountains to the east (see **VISUAL RESOURCES Figure 6a**). The view is panoramic, and the landscape is characterized primarily by grazing land. Some trees are visible in the middleground, and irrigated cropland is visible on the horizon. Two electric transmission lines and a dirt access road are visible running north to south approximately 1/3 mile to the west of the proposed power plant site. The existing quarry is visible to the east of the proposed power plant site. Some oil extraction facilities are discernible in the distance.

Visual Quality

Although the view from this location lacks outstanding visual features, the valley and the adjacent foothills and mountains provide some visual variety and interest. The

seasonally tan or light green color of most of the valley and the foothills visible from this area contrasts with the gray to blue to lavender colors of the mountains, the gray to blue colors of the sky, and the dark green color of the trees and irrigated agriculture. The existing cultural modifications, particularly the electric transmission lines, reduce the otherwise moderate visual quality of the area to low to moderate.

Viewer Sensitivity

Almost all of the travelers on Edmunston Pumping Plant Road are commuters to and from the pumping plant. Although these travelers are related to industrial activity, viewer sensitivity is low to moderate rather than low because the setting is generally rural, so travelers' view expectations are higher than they would be in an industrial setting.

Visibility

Views toward the power plant site are generally unobstructed. The angle of view varies from being at the edge of the view from greater distances to perpendicular to the predominant view down the road at the closest point to the power plant site. Considering these factors, visibility is moderate to high.

Viewer Exposure

Edmunston Pumping Plant Road is lightly traveled. The proposed power plant site can be seen for several miles from the road, so duration of view is moderate. The view distance is foreground to middleground. Considering these factors, viewer exposure for this view area is moderate.

Visual Susceptibility

For the view area along Edmunston Pumping Plant Road visual quality is low to moderate, viewer sensitivity is low to moderate, visibility is moderate to high, and viewer exposure is moderate, so visual susceptibility is low to moderate.

INTERSTATE 5

The view area along Interstate 5 was chosen because it is the only heavily used travel corridor (and the primary area of public visual access) in the project area. KOP 2, which represents this view area, is located approximately 5.2 miles (27,500 feet; PEF/Thompson 2000f, Data Response No. 37) west of the proposed power plant site, at the southbound weigh station along Interstate 5, 1.1 miles north of Grapevine (see **VISUAL RESOURCES Figure 2**). The view from KOP 5 (see **VISUAL RESOURCES Figure 7a**) includes the highway and electric lines on wood poles in the immediate foreground, grazing land in the foreground and middleground, and the Tejon Hills and the Tehachapi Mountains in the background. A narrow strip of irrigated vegetation is visible in the background. Electric transmission lines on lattice towers are barely discernible in the background.

Visual Quality

The landscape in the view from KOP 2 provides visual variety and interest. The dominant features in the view are the Tejon Hills and the Tehachapi Mountains. Their varied shapes contrast with the flat valley. Substantial color contrast exists

between the light green to tan of most of the valley, the dark green of the trees and irrigated agriculture, the light green to lavender of the hills, the gray to blue of the mountains, and the white to blue of the sky. The existing cultural modifications, particularly the highway with its white concrete divider, reduce visual quality. However, the highway and divider are less noticeable to travelers than they appear in the photo because the photo was taken from the west side of the highway. From this viewpoint the travel lanes and divider occupy much more of the view than they do for travelers, who are farther east and higher than the divider. Considering all of these factors, visual quality is moderate for this view area.

Viewer Sensitivity

Travelers on Interstate 5 include a mix of recreational travelers, commuters, and freight haulers. Their view sensitivity ranges from high to low. However, the level of use (Average Daily Traffic of 52,000 vehicles; PEF 1999a, Table 5.11-1) is very high, and it is estimated that a substantial number of recreational travelers use this route. In addition, the visual setting is predominantly rural, so viewer expectations are higher than they would be for an industrial area. Therefore, viewer sensitivity is high for this view area.

Visibility

The view toward the power plant site is unobstructed. However, due to the direction of travel, only southbound travelers have the power plant site in their primary view direction. The fog during much of winter and haze during much of the rest of the year, combined with the considerable view distance, limit the visibility of the power plant site. Considering these factors, visibility is moderate.

Viewer Exposure

The sites and routes for of all of the project components are in the background. At such distances view duration is moderate rather than short, despite the high speed of vehicles. The number of viewers is high. Considering these factors, viewer exposure is moderate.

Visual Susceptibility

From the view area along Interstate 5 visual quality is moderate, viewer sensitivity is high, visibility is moderate, and viewer exposure is moderate, so visual susceptibility is moderate to high.

LAVAL ROAD

KOP 3 is on Laval Road, approximately 2.6 miles (13,750 feet; PEF/Thompson 2000f, Data Response No. 37) north of the proposed power plant site and five miles east of Interstate 5 (see **VISUAL RESOURCES Figure 2**). KOP 3 was chosen to depict the view of the proposed power plant site from the closest point with public visual access (see **VISUAL RESOURCES Figure 8a**). The view from KOP 3 is panoramic, encompassing agricultural fields, orchards, and the Tehachapi Mountains. Electric transmission lines on steel lattice towers are also present in part of the view, running from the foreground to the background. The view from KOP 3 is also somewhat representative of views from residences approximately two

miles west of KOP 3 and approximately four miles from the proposed power plant site. However, the existing transmission lines are not prominent in views from these residences.

Visual Quality

The landscape in the view from KOP 3 provides visual variety and interest. The view is dominated by the agricultural fields in the foreground and the Tejon Hills and the Tehachapi Mountains in the background. The dark green band of orchards between the fields in the foreground and the hills and mountains in the background contrasts with the tan fields and the lavender, gray, and blue foothills and mountains and the white to blue sky. The varied forms of the hills and mountains contrasts with the rectilinear form of the fields and the narrow band of the orchards. Visual quality is moderate to high for views from the residences about four miles northwest of the site, but views from KOP itself are only of moderate visual quality due to the prominence of the existing transmission lines.

Viewer Sensitivity

Travelers on Laval Road consist primarily of workers engaged in agricultural activities. The visual setting is predominantly rural, but oil extraction facilities are scattered throughout the region, so industrial facilities are not unexpected, and transmission lines similar to the proposed line cross the area. Considering these factors, viewer sensitivity is low to moderate for travelers, and moderate to high for residences.

Visibility

Although the view from KOP 3 is panoramic, the orchards in the middleground would screen the lower portions of the proposed power plant from view. Fog during much of winter and haze during much of the rest of the year, combined with the considerable view distance, further limit the visibility of the power plant site. Considering these factors, visibility is low to moderate.

Viewer Exposure

The proposed power plant site and transmission line route are approximately three miles from KOP 3, in the background. For travelers on Laval Road duration of view is short and the number of viewers is small. Considering these factors, viewer exposure is low for travelers on Laval Road. For the residences west of KOP 3, the view distance is approximately four miles (background), duration of view is long, and the number of viewers is moderate (approximately twelve residences), so viewer exposure is moderate.

Visual Susceptibility

For the view area along Laval Road visual quality is moderate and visibility is low to moderate. For travelers viewer sensitivity is low to moderate and viewer exposure is low, so visual susceptibility is low to moderate. For residences viewer sensitivity is high and viewer exposure is moderate, so visual susceptibility is moderate.

IMPACTS

PROJECT SPECIFIC IMPACTS

CONSTRUCTION IMPACTS

POWER PLANT VICINITY

The PEF power plant site and construction laydown area are located at the base of the Tehachapi Mountains, in an unincorporated area of Kern County. The site slopes downward slightly to the north. The vicinity is rural. Most of the land is used for grazing. A quarry is located just southeast of the site. Two electric transmission lines run north to south approximately 1/3 mile to the west of the power plant site. The California Aqueduct is approximately one mile south of the site. Edmunston Pumping Plant Road runs along the north side of the aqueduct. Although this road is accessible to the public, it is a private dead-end road that leads only to the Edmunston Pumping Plant.

POWER PLANT, ELECTRIC TRANSMISSION LINE, WATER SUPPLY PIPELINE, AND ACCESS ROAD

Construction of the proposed power plant, electric transmission line, water supply pipeline, and access road would cause temporary visual impacts due to the presence of equipment, materials, and workforce. These impacts would occur at the proposed power plant site and construction laydown area, and along the rights of way for the transmission line, the water supply pipeline, and the access road. Traffic would also increase dramatically along Edmunston Pumping Plant Road.

The proposed power plant site and construction laydown area and the rights of way for the transmission line, the water supply pipeline, and the access road are sufficiently distant from public travel corridors and residences that construction activities would not be visible, so no visual impacts would occur. Construction activities would be visible from Edmunston Pumping Plant Road, but because visual quality, viewer sensitivity, and viewer exposure are low to moderate, visual impacts would be less than significant.

FUEL GAS SUPPLY PIPELINE

Views of the fuel gas supply pipeline construction equipment, materials, and activities would be limited to a few motorists and, potentially, one residence in the direct foreground on David Road. Construction of the entire pipeline would require approximately nine months (PEF 1999a, p.3.8-10). Because of the small number of viewers and the short duration of construction along any particular portion of the route, visual impacts, while adverse, would be less than significant.

OPERATION IMPACTS

EDMUNSTON PUMPING PLANT ROAD (KEY OBSERVATION POINT 1)

VISUAL RESOURCES Figure 6b shows the view from KOP 1 (see **VISUAL RESOURCES Figure 2**) with the proposed project simulated in the view. The lower portions of the proposed power plant structures are screened from view by the proposed berm and terrain. The upper portions of the three proposed HRSG exhaust stacks are the most prominent power plant features. Other noticeable power plant features include the three HRSG units and the water tank. Four of the proposed steel lattice electric transmission line towers and a portion of a fifth tower are visible. The proposed paved access road runs across the center of the view.

Contrast with Structures

The proposed HRSG stacks and water tank would cause moderate form contrast with the existing steel lattice electric transmission line structures because they are solid. The proposed electric transmission towers would cause low contrast with the existing transmission towers because they are similar to one set of the existing towers in form, line, color, and scale. The asphalt access road would cause moderate contrast with existing structures (the transmission towers) in regard to its bandlike form, its partially curved line, its dark color, and its somewhat larger scale. Other project elements would cause low levels of contrast with existing structures. In summary, from KOP 1 contrast with structures would be moderate in regard to form, line, color, and scale.

Contrast with Vegetation

Vegetation visible in the view from Key Observation Point 1 toward the site consists primarily of grassland. Bands of dark green vegetation are also visible. The vertical and rectilinear form of the HRSG stacks would cause high contrast with the flat, irregular form of the grasslands and the irregular horizontal bands of the trees. The proposed gray color of the power plant would contrast moderately with the green tones of the trees and the seasonally green to tan tones of the grassland and the dark green tones of the trees. However, the black color of the proposed access road would contrast strongly with the predominantly tan color of the grasslands. Because of the distance of the power plant site from KOP1, the contrast between the flat surfaces of project elements and the moderate texture of existing vegetation would be moderate. However, the proposed transmission towers in the foreground would cause high texture contrast with vegetation. The proposed project structures would appear smaller in size than the grasslands, so scale contrast in regard to vegetation would be low. In summary, if no existing structures were visible, contrast with vegetation would be high in regard to form, line, color, and texture; and low in regard to scale. However, because the existing electric transmission line towers have already created high form, line, and texture contrast with the existing vegetation, the increment of form, line, and texture contrast that the project would create would be moderate rather than high. Nevertheless, because the color contrast between the existing transmission towers and the existing vegetation is only moderate, the increment of color contrast that the proposed access road would cause with existing vegetation would be high.

Contrast with Land/Sky

From KOP 1 the vertical and rectilinear form of the proposed HRSG stacks would cause high contrast with the flat landform of the valley and the irregular form of the adjacent hills and mountains. The proposed gray color of the power plant would contrast moderately with the typically blue color of the sky. The proposed project structures would appear smaller in size than the landforms and the sky, so scale contrast in regard to land and sky would be low. In summary, if no existing structures were visible, contrast with land and sky would be high in regard to form and line, moderate in regard to color, and low in regard to scale. However, because the existing electric transmission line towers have already created high form and line contrast with the existing land and sky, the increment of form and line contrast that the project would create would be moderate rather than high.

Scale Dominance

The project would appear small in comparison to the wide field of view, similar to existing structures, and would occupy a moderate part of the setting. Therefore, scale dominance from Key Observation Point 1 would be subordinate.

Spatial Dominance

Because the spatial composition of the view from Key Observation Point 1 is panoramic, the project would be subordinate in regard to composition. The proposed HRSG stacks and transmission towers would be near the center of the view, so spatial dominance in regard to position would be prominent. Because the visible portions of the project would be backdropped by sky, spatial dominance in regard to backdrop would be prominent. Overall spatial dominance would be co-dominant, similar to the existing transmission towers.

View Blockage

From Key Observation Point 1 the project would block a small part of the low to moderate quality view. Therefore, view blockage would be negligible.

Severity of Visual Change

From Edmunston Pumping Plant Road the severity of the visual change that the proposed project would cause would be strong because of the high color contrast of the proposed access road with existing vegetation.

Visual Impact

From Edmunston Pumping Plant Road the severity of visual change would be strong due to the high color contrast of the proposed access road with existing vegetation, but visual susceptibility is low to moderate due to low to moderate visual quality and viewer sensitivity, so visual impacts would be less than significant.

INTERSTATE 5 (KEY OBSERVATION POINT 2)

VISUAL RESOURCES Figure 7b shows the view from KOP 2 (see **VISUAL RESOURCES Figure 2**) with the proposed project simulated. Because the terrain

is flat and vegetation is low in the foreground and middleground, some portions of the proposed project, primarily the HRSG exhaust stacks, would be visible.

Contrast with Structures

The vertical form and straight line of the proposed HRSG stacks would appear similar to the form and line of the existing transmission poles in the view from KOP 2, so contrast with existing structures in regard to form and line would be low. The group of other power plant structures would appear predominantly horizontal, so they would be barely discernible from existing trees in the distance (see **VISUAL RESOURCES Figure 7b**). The proposed gray color of the power plant structures would contrast with the existing brown wood power poles. The texture of the power plant structures would not be discernible from this distance, so contrast with existing structures in regard to texture would be low. The proposed electric transmission towers would cause low contrast with the existing transmission towers because they would be barely visible and because they would be similar to one set of the existing towers in form, line, color, texture, and scale. The proposed power plant structures would appear much smaller in size than the existing wood transmission poles, so scale contrast in regard to existing structures would be low. The proposed access road would not be visible from this view area.

Because of the distance of the power plant site and transmission line route from KOP 2, the visibility of the project structures would be diminished because they would appear very small and because of the presence of haze or fog for much of the year. Therefore, color contrast with existing structures would be reduced down to low. In summary, contrast with existing structures would be low in regard to form, line, color, texture, and scale.

Contrast with Vegetation

Vegetation visible in the view from KOP 2 toward the site consists primarily of grassland. Thin bands of trees and irrigated vegetation on the valley floor are also visible. The hills in the background are primarily covered with grass, but groups of native trees are also visible. The vertical and rectilinear form of the HRSG stacks would contrast with the flat, irregular form of the grasslands and the horizontal bands of the trees. The straight lines of the power plant structures would be similar to the straight appearing borders of the valley grasslands and narrow bands of the valley trees, but would contrast with the irregular groups of native trees on the hills. The proposed gray color of the power plant would contrast moderately with the seasonally light green to tan of the valley grasslands, the seasonally light green to tan to lavender (due to distance and haze) of the hills, and the dark green of the trees. The flat surfaces of project elements would contrast with the moderate texture of existing vegetation. Because of the distance of the power plant site and transmission line route from KOP 2, the visibility of the project structures would be diminished because they would appear very small and because of the presence of haze or fog for much of the year. Therefore, form and line would be reduced from high down to moderate, and color and texture contrast would be reduced from moderate down to low. The proposed project structures would appear smaller in size than the grasslands, so scale contrast in regard to vegetation would be low. In summary, if no existing structures were visible, contrast with vegetation would be

moderate in regard to form and line, and low in regard to color, texture, and scale. However, because the existing electric transmission line poles have already created high form, line, and texture contrast with the existing vegetation, the increment of form and line contrast that the project would create would be low rather than moderate.

Contrast with Land/Sky

From KOP 2 the vertical and rectilinear form of the proposed HRSG stacks would contrast with the flat landform of the valley and the irregular form of the adjacent hills and mountains. The proposed gray color of the power plant would contrast with the typically blue color of the sky. The proposed project structures would appear smaller in size than the landforms and the sky, so scale contrast in regard to land and sky would be low.

Because of the distance of the power plant site from KOP 2, the visibility of the project structures would be diminished because it would appear small and because of the presence of haze or fog for much of the year. Therefore, form and line contrast with landforms would be reduced from high down to moderate, and color and texture contrast would be reduced from moderate down to low. The proposed project structures would appear smaller in size than the grasslands, so scale contrast in regard to vegetation would be low. In summary, if no existing structures were visible, contrast with land and sky would be moderate in regard to form and line, and low in regard to color, texture, and scale. However, because the existing electric transmission line poles have already created high form and line contrast with the land and sky, the increment of form and line contrast that the project would create would be low rather than moderate.

Scale Dominance

The project would appear very small in comparison to the wide field of view, and would occupy a very small part of the setting. Therefore, scale dominance from Key Observation Point 2 would be negligible.

Spatial Dominance

Because the spatial composition of the view from KOP 2 is panoramic and the project would appear very small, the spatial dominance of the project in regard to composition would be negligible. The proposed HRSG stacks and transmission towers would be near the center of the view, so spatial dominance in regard to position would be prominent. Because the visible portions of the project would be backdropped by hills, spatial dominance in regard to backdrop would be subordinate. Overall spatial dominance would be subordinate.

View Blockage

From KOP 2 the project would block a very small part of the moderate quality view. Therefore, view blockage would be negligible.

Severity of Visual Change

From the view area along Interstate 5 the proposed project would cause low levels of contrast, scale dominance would be negligible, overall spatial dominance would be subordinate, and view blockage would be negligible. Therefore, the severity of visual change would be weak.

Visual Impact

From the view area along Interstate 5 visual susceptibility is moderate to high but severity of visual change would be weak because of low levels of contrast, dominance, and view blockage, so visual impact would be less than significant.

LAVAL ROAD (KEY OBSERVATION POINT 3)

VISUAL RESOURCES Figure 8b shows the view from KOP 3 (see **VISUAL RESOURCES Figure 2**) with the proposed project simulated. Because the terrain between the view location and the proposed power plant site is flat and vegetation is low in the foreground and of moderate height in the middleground, some portions of the proposed project, primarily the upper portions of the HRSG exhaust stacks, would be visible.

Contrast with Structures

The vertical form and straight line of the proposed HRSG stacks would appear similar to the form and line of the existing transmission towers in the view from KOP 3, so contrast with existing structures in regard to form and line would be low. A small portion of the HRSG units would be visible, but they are barely discernible, so they would create a low level of contrast in regard to form and line (see **VISUAL RESOURCES Figure 8b**). The proposed gray color of the power plant structures would be very similar to the gray color of the existing transmission towers. The texture of the power plant structures would not be discernible from this distance, so contrast with existing structures in regard to texture would be low. The proposed electric transmission towers would cause low contrast with the existing transmission towers because they would be barely visible and because they would be similar to one set of the existing towers in form, line, color, texture, and scale. The proposed power plant structures would appear much smaller in size than the existing transmission towers, so scale contrast in regard to existing structures would be low. The proposed access road would not be visible from this view area. In summary, contrast with existing structures would be low in regard to form, line, color, texture, and scale.

Contrast with Vegetation

Vegetation visible in the view from Key Observation Point 3 toward the site includes row crops and fallow fields in the foreground, citrus orchards in the middleground, and grasslands with groups of native trees on the hills and mountains in the background. The hills and mountains in the background are primarily covered with grass, but groups of native trees are also visible. The vertical and rectilinear form of the HRSG stacks would contrast with the flat, horizontal form of the croplands and the horizontal form of the citrus groves and the irregular grasslands and trees on the hills and mountains. The straight lines of the power plant structures would be

similar to the straight appearing borders of the croplands and the narrow bands of the valley trees, but would contrast with the irregular groups of native trees on the hills. The proposed gray color of the power plant would contrast moderately with the seasonally light green to tan of the valley grasslands, the seasonally light green to tan to lavender (due to distance and haze) of the hills, and the dark green of the trees. The flat surfaces of project elements would contrast with the moderate texture of existing vegetation. Because of the distance of the power plant site and transmission line route from KOP 3, the visibility of the project structures would be diminished because they would appear very small and because of the presence of haze or fog for much of the year. Therefore, form and line contrast would be reduced down to moderate, and color and texture contrast would be reduced from down to low. The proposed project structures would appear smaller in size than the croplands or the grasslands, so scale contrast in regard to vegetation would be low. In summary, if no existing structures were visible, contrast with vegetation would be moderate in regard to form and line, and low in regard to color, texture, and scale. However, because the existing electric transmission line towers have already created high form, and line contrast with the existing vegetation, the increment of form and line contrast that the project would create would be low rather than moderate.

Contrast with Land/Sky

From KOP 3 the vertical and rectilinear form of the proposed HRSG stacks would contrast with the flat landform of the valley and the irregular form of the adjacent hills and mountains. The proposed gray color of the power plant would contrast with the typically blue color of the sky. The proposed project structures would appear smaller in size than the landforms and the sky, so scale contrast in regard to land and sky would be low.

Because of the distance of the power plant site from KOP 3, the visibility of the project structures would be diminished because it would appear small and because of the presence of haze or fog for much of the year. Therefore, form and line contrast with landforms would be reduced from high down to moderate, and color and texture contrast would be reduced from moderate down to low. The proposed project structures would appear smaller in size than the croplands, orchards or foothills and mountains, so scale contrast in regard to landform would be low. In summary, if no existing structures were visible, contrast with land and sky would be moderate in regard to form and line, and low in regard to color, texture, and scale. However, because the existing electric transmission line towers have already created high form and line contrast with the land and sky, the increment of form and line contrast that the project would create would be low rather than moderate.

Scale Dominance

The project would appear very small in comparison to the wide field of view, and would occupy a very small part of the setting. Therefore, scale dominance from KOP 3 would be negligible.

Spatial Dominance

Because the spatial composition of the view from KOP 3 is panoramic and the project would appear very small, the spatial dominance of the project in regard to composition would be negligible. The proposed HRSG stacks and transmission towers would be near the center of the view, so spatial dominance in regard to position would be prominent. Because the visible portions of the project would be backdropped by hills, spatial dominance in regard to backdrop would be subordinate. Overall spatial dominance would be subordinate.

View Blockage

From KOP 3 the project would block a very small part of the moderate quality view. Therefore, view blockage would be negligible.

Severity of Visual Change

From the view area along Laval Road the proposed project would cause low levels of contrast, scale dominance would be negligible, overall spatial dominance would be subordinate, and view blockage would be negligible. Therefore, the severity of visual change would be weak.

Visual Impact

From KOP 3 visual susceptibility is moderate and severity of visual change would be weak because of low levels of contrast, dominance, and view blockage, so visual impact would be insignificant.

FUEL GAS SUPPLY PIPELINE

Most of the portions of the fuel gas supply pipeline route that are visible to the public, including those that are in the foreground, are within existing farm roads and fire access roads or along a rural public road (Sebastian Road). Along these portions of the route operations impacts would be less than significant because the long-term visible effects of the pipeline would be limited to marker signs. Other portions of the route are through grasslands. Some of these portions are not visible to the public. Vegetation clearance along the visible portions of the route through grasslands would create contrast in form, line, and color due to the band of exposed earth. However, the right of way along these sections of the route is barely visible from public view areas, so the levels of contrast would not be high. In addition, the impacts of vegetation clearance are not expected to be noticeable after one growing season. Therefore, long-term visual impacts due to the fuel gas supply pipeline would be less than significant.

LIGHTING

In regard to exterior lighting, the applicant has stated the following:

> "Night lighting will be hooded to direct illumination downward and inward toward the areas to be illuminated in order to minimize nighttime light and glare, backscatter to the nighttime sky, and visibility of lighting to public viewing areas. A specific lighting plan will be submitted to the CEC for approval. The plan will include provisions for timed and/or motion detection-controlled switches with the

213-foot tall stacks to be illuminated only as necessary to meet FAA or other safety requirements. The lighting plan will also propose a procedure to resolve any lighting complaints."

The potential exists for the project to cause significant lighting impacts because of the relatively low lighting levels in the rural vicinity. Exterior lighting for the proposed power plant therefore has the potential to considerably increase lighting levels, changing the visual character of the vicinity from rural to industrial, creating glare, backscatter to the nighttime sky, and illumination of visible plumes. However, the Energy Commission staff has expanded the applicant's proposed design measures in a proposed condition of certification (see below). Proper implementation of these measures is expected to minimize lighting and keep lighting impacts to less than significant levels.

VISIBLE PLUMES

The visibility of plumes depends partly on viewing conditions. The visibility of nighttime plumes depends on the degree to which they are illuminated. Because existing exterior lighting levels in the vicinity of the power plant site are very low, and because the applicant has proposed to minimize exterior lighting, the plumes are not expected to be substantially visible at night. Therefore, staff has excluded plumes during nighttime hours from its analysis. Weather conditions such as haze and fog can also reduce visibility. In response to a staff data request, the applicant has provided detailed information regarding weather conditions and expected plume frequency and size (PEF 2000, Response to Data Requests 38 through and 41). Staff requested that the applicant consider two cases of daytime visibility: one when visibility is five miles or greater and another when visibility is three miles or greater. Staff selected the first case because the closest major travel corridor, Interstate 5, is approximately five miles from the proposed power plant site. Staff selected the second case because some residences are within five miles of the proposed power plant site, but none are within three miles. Therefore, the first case was considered in evaluating visual impacts of plumes on travelers on Interstate 5 and residences more than five miles from the proposed power plant site, and both cases were considered for the nearest residences, between three and five miles from the power plant site.

Cooling Tower Plumes

The two proposed cooling tower banks would cause visible vapor plumes created by condensation of water in the plumes of moist air emitted from the cooling towers. The larger western cooling tower bank would generally produce larger plumes. In response to staff's data requests, the applicant provided detailed information regarding the calculated characteristics of potential cooling tower plumes (see **VISUAL RESOURCES Table1**; from PEF 2000, Response to Data Requests 38 and 39). Staff evaluated this information and concludes that the assumptions and procedures are reasonable (Loyer 2000). The response concluded that the two cooling tower banks would have visible plumes virtually any time that they are operating, but most of the time the plumes would be small. The response stated that to reduce formation of larger plumes, PEF will mix dry ambient air with the saturated air exiting the cooling towers. With this technique, modeling

VISUAL RESOURCES Table 1
Expected Length, Height, and Width of Cooling Tower Plumes

PLUME DIMENSIONS	PERCENT OF TIME					
	ALL HOURS OF THE YEAR		DAYLIGHT HOURS WITH VISIBILITY AT LEAST 3 MILES		DAYLIGHT HOURS WITH VISIBILITY AT LEAST 5 MILES	
	COOLING TOWER BANK		COOLING TOWER BANK		COOLING TOWER BANK	
	WEST	EAST	WEST	EAST	WEST	EAST
- LENGTH (m)						
- at least 10	100	100	100	100	100	100
- at least 20	85.73	76.95	71.25	75.21	70.06	27.11
- at least 30	16.17	15.43	4.34	3.49	3.8	3.08
- at least 40	6.69	1.21	1.85	1.15	1.93	1.23
- at least 50	5.54	0.41	1.17	0.7	1.21	0.73
- at least 60	1.08	0.07	0.68	0.28	0.68	0.29
- HEIGHT (m)						
- at least 10	100	100	100	100	100	100
- at least 20	89.01	67.59	73.35	74.13	72.02	25.86
- at least 30	2.26	1.84	0.65	0.28	0.65	0.33
- at least 40	1.05	0	0.64	0.23	0.64	0.25
- WIDTH (m)						
- at least 10	100	100	100	100	100	100
- at least 20	9.54	5.32	5.15	4.65	5.03	2.75
- at least 30	2.66	2.95	1.8	1.7	0.64	0.53
- at least 40	0.66	0.64	0.53	0	0.54	0

results indicate that, considering all hours of the year, for ninety percent of the time cooling tower plumes would be less than 40 meters long, less than 20 meters high, and less than 20 meters wide. The realistic maximum sized cooling tower plumes[4] would be greater than 600 meters long, greater than 60 meters high, and greater than 40 meters wide. Since the impact assessment is based on modeling assumptions that include the applicant's commitment to mix dry ambient air with the saturated air exiting the cooling towers to reduce formation of larger plumes, staff has proposed a condition of certification to ensure that this measure is implemented (see below).

Interstate 5

During daylight hours with visibility at least five miles, more than 96 percent of the time cooling tower plumes would be less than 30 meters long, less than 30 meters high, and less than 20 meters wide. The realistic maximum plumes would be less than 60 meters long, 30 meters high, and 30 meters wide. Even the realistic maximum plumes would barely be visible to travelers on Interstate 5 or residences more than five miles from the proposed project site, so visual impacts in these viewers would not be significant.

Residences along Laval Road

For the nearest residences, along Laval Road, the realistic maximum plumes would be less than 60 meters long, 30 meters high, and 40 meters wide. The realistic maximum plumes would be visible to the nearest residences, approximately four miles from the proposed power plant site. However, plumes of that size would occur only very rarely, so such plumes would not cause significant visual impacts. The more frequent plumes would be barely visible, so they would not cause significant visual impacts to the nearest residences.

Exhaust Stack Plumes

The three HRSG exhaust stacks have the potential to cause visible vapor plumes created by condensation of water in the plumes of moist air emitted from the stacks. In response to staff's data requests, the applicant's plume consultant provided detailed information regarding the calculated characteristics of potential exhaust stack plumes (PEF/Thompson 2000, Responses to Data Requests 40 and 41). Staff evaluated this information and concludes that the assumptions and procedures are reasonable (Loyer 2000). The consultant subsequently provided revisions to some of the calculations (see **VISUAL RESOURCES Table 2**; from Winges 2000b). The model results indicate that visible exhaust plumes would form approximately 35 percent of the time. If hours of darkness, fog, and reduced visibility are excluded, such plumes would form approximately 23 percent of the time. For daylight hours without fog and with visibility at least three miles, stack plumes would be visible approximately 20 percent of the time. During daylight hours without fog and with visibility at least five miles, stack plumes would be visible approximately 18 percent of the time.

Interstate 5

For travelers on Interstate 5, approximately five miles from the proposed power plant site, daytime plumes of typical size would be visible approximately nine percent of the time. Such plumes, for each of the three stacks, would be approximately 172 meters (564 feet)

[4] Defined as the minimum value for dimensions of the plumes that would occur one percent of the time.

long, 201 meters (659 feet) high, and 32 meters (105 feet) wide. For five percent of the time the exhaust plumes would be approximately 226 meters (741 feet) long or greater, 273 meters (896 feet) high or greater, and 43 meters (141 feet) wide or greater. The realistic

VISUAL RESOURCES Table 2
Expected Length, Height, and Width* of HRSG Exhaust Stack Plumes

	ALL HOURS (23,626 hours evaluated)				DAYLIGHT, VISIBILITY AT LEAST 3 MILES (10,333 hours evaluated)				DAYLIGHT, VISIBILITY AT LEAST 5 MILES (9,713 hours evaluated)			
	Hours	Length	Height	Width	Hours	Length	Height	Width	Hours	Length	Height	Width
PERCENT OF TIME												
35	8256	**	87	11								
30	7089	**	126	21								
25	5907	144	146	24								
20	4725	216	160	27	2068	**	102	17				
15	3544	285	171	31	1551	107	155	27	1457	**	133	24
10	2363	363	212	40	1034	273	204	33	971	157	188	30
5	1181	471	219	55	518	236	320	46	486	226	273	43
1	236	768	611	70	104	357	729	66	97	344	690	65

* Width is for each of the three stacks.
** No plume length; due to calm weather conditions.

maximum stack plumes would be even larger: approximately 344 meters (1,129 feet) long, 690 meters (2,264 feet) high, and 65 meters (213 feet) wide

As previously discussed, visual quality in views from Interstate 5 is moderate, viewer sensitivity is high, and viewer exposure is moderate. Whereas visibility of the power plant site is low to moderate, visibility of the stack plumes would be greater, both because the plumes included in this analysis are those that would occur when meteorological and light conditions are conducive to seeing plumes and because the plumes would rise above the intervening vegetation, so visibility would be moderate to high. Considering all of these factors, the visual susceptibility for travelers on Interstate 5 is moderate to high.

Industrial plumes are not part of the existing viewshed for travelers along this portion of Interstate 5. Such plumes would contrast with the generally rural character of the area, potentially degrading its visual quality. Therefore, the stack plumes may have the potential to cause significant visual impacts for travelers on Interstate 5. However, determining whether the impacts would be significant is difficult without a visual simulation of the plumes to understand their size relative to the landscape and the degree of contrast that they would create. Staff proposes that the applicant provide a visual simulation of the plumes as seen from KOP 2 (see below).

Residences along Laval Road

For the residences approximately four miles away on Laval Road, for each of the project's three HRSG stacks, the typical sized daytime plumes, which would be visible approximately ten percent of the time. Such plumes would be between approximately 157 meters (515 feet) and 273 meters (896 feet) long or greater, between 188 meters (617 feet) and 204 meters (669 feet) high or greater, and between 30 meters (98 feet) and 33 meters (108 feet) wide or greater. For five percent of the time the plumes would be between approximately 226 meters (741 feet) and 273 meters (896 feet) long or greater, between 273 meters (896 feet) and 320 meters (1,050 feet) high or greater, and between 43 meters (141 feet) and 46 meters (151 feet) wide or greater. The realistic maximum size stack plumes would be between approximately 344 meters (1,129 feet) and 357 meters (1,171 feet) long, between 690 meters (2,264 feet) and 729 meters (2,392 feet) high, and between 65 meters (213 feet) and 66 meters (217 feet) wide.

As previously discussed, the visual quality in views from the residences is moderate to high, viewer sensitivity is high, and viewer exposure is moderate. Whereas visibility of the power plant site and structures is low to moderate, visibility of the stack plumes would be greater, both because the plumes included in this analysis are those that would occur when meteorological and light conditions are conducive to seeing plumes and because the plumes would rise above the intervening vegetation. Therefore, visibility of stack plumes would be moderate to high. Considering all of these factors, the visual susceptibility for the residences is moderate to high. Industrial plumes are not part of the existing viewshed. Such plumes would contrast with the rural character of the area, potentially degrading its visual quality. Therefore, the stack plumes may have the potential to cause

significant visual impacts. However, determining whether the impacts would be significant is difficult without a visual simulation of the plumes to understand their size relative to the landscape and the degree of contrast that they would create. Staff proposes that the applicant provide a visual simulation of the plumes as seen from KOP 3 (see below).

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?

No recognized scenic vistas exist in the project viewshed, so the project would not cause significant visual impacts in regard to 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?

Views of the valley and mountains from the residences along Laval Road and from Interstate 5 are arguably scenic, and the HRSG stack plumes could detract from these views, so the project may have the potential to cause significant visual impacts. Staff proposes that the applicant provide visual simulations of the plumes to aid in the determination of impact significance (see below).

3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

The HRSG stack plumes may degrade the existing moderate to high visual quality of views from the residences along Laval Road and the moderate visual quality of views from southbound Interstate 5, so the project may have the potential to cause significant visual impacts. Staff proposes that the applicant provide visual simulations of the plumes to aid in the determination of impact significance (see below).

4. Would the project create a new source of substantial light or glare which would adversely affect day 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. However, the mitigation measures proposed by the applicant and expanded by staff (see below) would ensure that lighting impacts would be less than significant.

CUMULATIVE IMPACTS

No other planned projects have been identified that could contribute to cumulative visual impacts along with the proposed project. However, the proposed project

would add to the degradation of visual quality caused by other development in the area.

For the view area along Edmunston Pumping Plant Road represented by KOP 1, the existing electric transmission lines and quarry have degraded the visual quality of the area near the proposed power plant site and electric transmission line route. Although the proposed project would add noticeably to that degradation, because of the low viewer sensitivity of travelers on the road and small number of viewers, the cumulative impact would not be significant.

For the view area along Interstate 5 represented by KOP 2, the existing highway and electric lines have noticeably affected the views. The proposed project structures would barely be visible from this view area, so their contribution to cumulative impacts would not be substantial. The visible plumes from the proposed HRSG stacks may have the potential to contribute noticeably to the cumulative visual impacts on views from this area. Staff proposes that the applicant provide a visual simulation of the plumes from this view area to aid in determining impact significance (see below.

For the view area along Laval Road, agricultural development has substantially altered the natural landscape. However, although the development has changed the visual character, it has not greatly diminished the visual quality. The proposed project structures would barely be visible from this view area, so their contribution to cumulative impacts would not be substantial. The visible plumes from the proposed HRSG stacks may have the potential to contribute noticeably to the cumulative visual impacts on views from this area. Staff proposes that the applicant provide a visual simulation of the plumes from this view area to aid in determining impact significance (see below).

FACILITY CLOSURE

INTRODUCTION

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

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 should address removal of the power plant structures and the transmission poles to reduce visual impacts.

UNEXPECTED TEMPORARY CLOSURE

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

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 should address removal of the power plant structures and the transmission poles to reduce visual impacts.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

LOCAL

KERN COUNTY

The applicant has proposed that when final construction drawings of the project are completed, they will prepare a Landscape Plan (PEF 1999a, p.5.13-21). The Landscape Plan would be designed to conform to the landscape requirements in Chapter 19.86 of the Kern County Zoning Code. Staff has proposed a condition of certification (see below) to ensure that the Landscape Plan and its implementation will satisfy the requirements of the Kern County General Plan and Zoning Code.

Kern County Planning Department staff has also proposed other specific conditions related to the project (Rickels 2000). The four conditions regarding visual resources consist of the following:

- Parking lot or site illumination shall be directed away from adjoining properties and public roads.

- All trash receptacles shall be screened in such a manner so that they are not visually obtrusive from any off-site location. The location and method of screening for all trash receptacles shall be approved by the Director of the Kern County Planning Department prior to construction.

- All signs shall be approved by the Director of the Kern County Planning Department prior to installation.

- The facility shall be painted to the greatest extent possible, in earthen hues to minimize visual intrusion.

Energy Commission staff has proposed condition of certification (see below) that would ensure that all of these requirements are satisfied. Illumination is addressed

in condition VIS-3. Screening of trash receptacles is specified in condition VIS-5. The design of signs is addressed in condition VIS-6. Appropriate paint colors are addressed in condition VIS-1.

MITIGATION

APPLICANT'S PROPOSED MITIGATION MEASURES

The applicant has proposed three mitigation measures to be incorporated into the project design to minimize visual impacts associated with the operation of the facility.

VIS-1. All project facilities including structures, buildings, fencing, and signs, will be painted with neutral earth-tone tan or gray colors that will blend with existing facilities and the background of existing vegetation. A specific painting plan will be developed for CEC approval to ensure that the proposed colors do not unduly contrast with the surrounding landscape colors. All treatments will be in non-reflective colors. The painting plan will be submitted sufficiently early to ensure that any precolored buildings, structures, and linear facilities will have colors approved and included in bid specifications for such buildings or structures.

VIS-2. Except as required by security and worker safety requirements, night lighting will be hooded to direct illumination downward and inward toward the areas to be illuminated in order to minimize nighttime light and glare, backscatter to the nighttime sky, and visibility of lighting to public viewing areas. A specific lighting plan consistent with operational and safety needs will be submitted to the CEC for approval. The plan will include provisions for timed and/or motion detection-controlled switches with the 213-foot tall stacks to be illuminated only as necessary to meet FAA or other safety requirements. The lighting plan will also propose a procedure to resolve any lighting complaints.

VIS-3. A specific landscaping plan will be prepared showing the location of proposed landscaping, the varieties and sizes of plants to be used, and the proposed time to maturity for each species.

ADDITIONAL MITIGATION

Energy Commission staff generally agrees with the applicant's proposals in regard to color, lighting, and landscaping for the power plant. However, staff's position is that these proposals need to be more precisely developed in conditions of certification, which staff proposes below. Staff also proposes two additional mitigation measures:

1. All project fencing should be non-reflective.

2. The visible plumes from the HRSG stacks should be minimized. Such mitigation has been used on the Crockett Cogeneration Project approved by the Energy Commission.

The Kern County Planning Department has also proposed mitigation measures related to visual resources, as described above regarding compliance with laws, ordinances, regulations, and standards. Staff has incorporated those measures into proposed conditions of certification, as previously explained and specified below.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The project as proposed may have the potential to cause significant adverse visual impacts due to the visible plumes from the HRSG stacks. Effective implementation of applicant's proposed mitigation measures, as modified, expanded, and augmented by staff's recommendations, is expected to reduce all other potential visual impacts to less than significant levels. With the proposed mitigation, the project is also expected to be in compliance with applicable laws, ordinances, regulations, and standards regarding visual resources.

RECOMMENDATIONS

Staff proposes that the applicant provide visual simulations showing the average size and maximum realistic size plumes from the proposed HRSG stacks from the view areas along Laval Road and Interstate 5. Staff will consider these simulations in determining the significance of the visual impacts of the plumes and will include that determination in the Final Staff Assessment.

The Energy Commission should adopt the following conditions of certification if it approves the project.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 Prior to first turbine roll, the project owner shall treat the project structures, buildings, and tanks in an earthen hue or hues that minimize visual intrusion and contrast by blending with the surrounding landscape, and shall treat those items and the switchyard structures and electric transmission towers in a non-reflective finish.

Protocol: Protocol: The project owner shall submit a treatment plan for the project to the California Energy Commission Compliance Project Manager (CPM) for review and approval. The treatment plan shall include:

- specification, and 11" x 17" color simulations, of the treatment proposed for use on project structures, including structures treated during manufacture;
- a list of each major project structure, building, and tank, specifying the color(s) proposed for each item;

- documentation that a non-reflective finish will be used on all project elements visible to the public;

- a detailed schedule for completion of the treatment; and,

- a procedure to ensure proper treatment maintenance for the life of the project.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall submit a revised plan to the CPM.

After approval of the plan by the CPM, the project owner shall implement the plan according to the schedule and shall ensure that the treatment is properly maintained for the life of the project.

For any structures that are treated during manufacture, the project owner shall not specify the treatment of such structures to the vendors until the project owner receives notification of approval of the treatment plan by the CPM.

The project owner shall not perform the final treatment on any structures until the project owner receives notification of approval of the treatment plan from the CPM.

The project owner shall notify the CPM within one week after all precolored structures have been erected and all structures to be treated in the field have been treated and the structures are ready for inspection.

Verification: At least 60 (sixty) days prior to ordering the first structures that are color treated during manufacture, the project owner shall submit its proposed plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

Not less than thirty (30) days prior to the start of commercial operation, the project owner shall notify the CPM that all structures treated during manufacture and all structures treated in the field are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-2 All fencing for the project shall be non-reflective.

Protocol: Prior to ordering the fencing the project owner shall submit to the CPM for review and approval the specifications for the fencing documenting that such fencing will be non-reflective.

If the CPM notifies the project owner that revisions of the specifications are needed before the CPM will approve the submittal, the project owner shall submit to the CPM revised specifications.

The project owner shall not order the fencing until the project owner receives approval of the fencing submittal from the CPM.

The project owner shall notify the CPM within one week after the fencing has been installed and is ready for inspection.

Verification: Prior to first turbine roll and at least 30 (thirty) days prior to ordering the non-reflective fencing, the project owner shall submit the specifications to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the fencing that the fencing is ready for inspection.

VIS-3 Prior to first turbine roll, the project owner shall design and install all lighting such that light bulbs and reflectors are not visible from public viewing areas and illumination of the vicinity and the nighttime sky is minimized. To meet these requirements:

Protocol: The project owner shall develop and submit a lighting plan for the project to the CPM for review and approval. The lighting plan shall require that:

- Lighting is designed so that exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of this outdoor lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;
- High illumination areas not occupied on a continuous basis such as maintenance platforms or the main entrance are provided with switches or motion detectors to light the area only when occupied;
- A lighting complaint resolution form (following the general format of that in attachment 1) will be used by plant operations, to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

Lighting shall not be installed before the plan is approved. The project owner shall notify the CPM when the lighting has been installed and is ready for inspection.

Verification: At least 90 (ninety) days before ordering the exterior lighting, the project owner shall provide the lighting plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days of completing exterior lighting installation that the lighting is ready for inspection.

VIS-4 The project owner shall provide landscaping satisfactory to the Kern County Planning Department.

Protocol: The project owner shall submit a landscaping plan to the CPM for review and approval. The submittal shall include evidence that the plan is satisfactory to the Director of the Kern County Planning Department.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, the project owner shall submit to the CPM a revised plan.

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 60 (sixty) days prior to installing the landscaping, the project owner shall submit the plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within 7 (seven) days after completing installation of the landscaping that the landscaping is ready for inspection.

VIS-5 The project owner shall screen all trash receptacles in such a manner so that they are not visually obtrusive from any off-site location. The location and method of screening for all trash receptacles shall be approved by the Director of the Kern County Planning Department prior to construction.

Protocol: The project owner shall submit a plan for screening refuse storage areas to the CPM for review and approval. The submittal shall include evidence that the screening plan is acceptable to the Director of the Kern County Planning Department.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, the project owner shall submit to the CPM a revised plan.

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 60 (sixty) days prior to installing the screening, the project owner shall submit the plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within 7 (seven) days after completing installation of the screening that the screening is ready for inspection.

VIS-6 The project owner shall comply with Kern County's requirements regarding signs.

Protocol: The project owner shall submit a plan for signs for the project to the CPM for review and approval. The submittal shall include evidence that the plan is acceptable to the Director of the Kern County Planning Department.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, the project owner shall submit to the CPM a revised plan.

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 60 (sixty) days prior to installing the signage, the project owner shall submit the plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within 7 (seven) days after completing installation of the signage that the signage is ready for inspection.

VIS-7 The project owner shall design and operate the project to mix dry ambient air with the saturated air exiting the cooling towers to prevent formation of plumes longer than 60 meters, higher than 60 meters, and wider than 30 meters.

The project owner shall develop and submit a plan to achieve this performance standard to the CPM for review and approval. If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

The plan shall not be implemented until it is approved. The project owner shall notify the CPM when the plan has been implemented.

Verification: At least 90 (ninety) days before ordering any equipment to be used to limit the size of cooling tower plumes, the project owner shall provide the plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days after implementing the plan.

REFERENCES

CEC (California Energy Commission/Lewis) 2000b. Pastoria Energy Facility – First Set of Data Requests (Numbers 1 to 44). Submitted to CEC on March 3.

Kern County 1994. General Plan.

Loyer, Joe. 2000. California Energy Commission staff. Memorandum to Gary Walker, California Energy Commission staff.

PEF (Pastoria Energy Facility) 1999a. Application for Certification, Volumes I and II, Pastoria Energy Facility Project (AFC-99-7). Submitted to the California Energy Commission on November 30.

PEF (Pastoria Energy Facility) 2000a. Response to CEC Data Adequacy Comments Dated December 29, 1999 (Supplement to AFC-99-7). Submitted to the California Energy Commission on January 5.

PEF (Pastoria Energy Facility/Parquet) 2000a. Project Description Clarification for the Pastoria Energy Facility. Submitted to CEC/Rhoads on March 1.

PEF (Pastoria Energy Facility/Thompson) 2000f. Applicant's Data Request Responses. Submitted to the California Energy Commission on April 3.

PEF (Pastoria Energy Facility/Thompson) 2000. Applicant's Responses to CEC Staff Data Requests 27, 38, 39, 40, 41, and 42. Submitted to the California Energy Commission on May 15.

PEF (Pastoria Energy Facility/Thompson) 2000k. Pastoria Energy Facility Water Supply Plan. Submitted to the California Energy Commission on May 16.

Rickels, David. 2000. Senior Planner, Kern County Planning Department. FAX to Amanda Stennick, Energy Commission staff, regarding conditions of approval for Pastoria project. March 20.

Winges, Kirk. 2000a. Senior Atmospheric Scientist, MFG Consulting Scientists and Engineers. Letter to Gary Walker, California Energy Commission staff. May 17.

Winges, Kirk. 2000b. Senior Atmospheric Scientist, MFG Consulting Scientists and Engineers. E-mail to Gary Walker, California Energy Commission staff. July 3.

ATTACHMENT 1
LIGHTING COMPLAINT RESOLUTION FORM

LIGHTING COMPLAINT RESOLUTION FORM

PASTORIA ENERGY FACILITY Kern 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.)

Visual Resources Figures 1 through 7

VISUAL RESOURCES Figure 1
Power Plant Site Visibility Map

Source: PEF 2000a, Map 5.13-1

VISUAL RESOURCES Figure 2
Key Observation Points

Source: PEF 1999a, Figure 5.13-1

VISUAL RESOURCES Figure 3
Additional Viewpoints

Source: PEF 1999a, Figures 5.13-3, 4, and 5

VISUAL RESOURCES Figure 4

Proposed Lattice Steel Double Circuit Electric Transmission Tower

Source: PEF 1999a, Figure 3.6-3

VISUAL RESOURCES Figure 5a
Existing View from Edmunston Pumping Plant Road (KOP1)

VISUAL RESOURCES Figure 5b
Proposed Project from Edmunston Pumping Plant Road (KOP 1)

Source: PEF 1999a, Figure 5.13-6

VISUAL RESOURCES Figure 6a
Existing View from Interstate 5 (Key Observation Point 2)

VISUAL RESOURCES Figure 6b
Proposed Project from Interstate 5 (Key Observation Point 2)

Source: PEF 1999a, Figure 5.13-7

VISUAL RESOURCES Figure 7a
Existing View from Laval Road (Key Observation Point 3)

VISUAL RESOURCES Figure 7b
Proposed Project from Laval Road (Key Observation Point 3)

Source: PEF 1999a, Figure 5.13-8

CULTURAL RESOURCES

Roberta S. Greenwood and Dorothy Torres

INTRODUCTION

This analysis discusses cultural resources, which are defined as evidence of human occupation or use of the land. Such evidence may be physical, as in the form of artifacts or structures left by those who came earlier; archival, in the form of early documents, photographs, or maps; or the creation or modification of historical landscapes as the result of agriculture, mining, or other endeavor. Places regarded as important by Native Americans or local national/ethnic groups may also be considered cultural resources. All such evidence of California's early occupation is becoming increasingly vulnerable due to the ongoing development, industrialization, and urbanization of the state.

Cultural resource materials may be found nearly anywhere in California: from the offshore islands to the desert interiors; along rivers and streams; from inland valleys to mountain peaks; and in particular environmental niches where natural resources such as plants and animals sought as food, minerals, or other useful raw materials occur. Cultural resources may be visible on the surface or deeply buried as a result of sedimentation or subsequent uses of the same land. In some areas, a sequence of settlements on the same site may result in multiple layers of cultural resources, often of both prehistoric and historical origins.

Cultural resources are the key to understanding our history and heritage, as reflected in the many cultures which have contributed to the present. Critical to such analysis are the spatial relationships between the constituents of an undisturbed site and the environmental resources and features as they existed at the time of each occupation. The goal of reconstructing the sequences of human occupation and land use in relation to the prevailing environment is to approach insights into the way of life of the former inhabitants, and explanations for their behaviors and changes in the cultures.

Staff's primary concerns in the cultural resource analysis are to ensure that all resources are identified, that potential impacts are made known, and that conditions are set forth to avoid significant impacts. The determination of potential impacts to cultural resources from the proposed Pastoria Energy Facility (PEF) is required by the Siting Regulations of the California Energy Commission (Energy Commission) and by the California Environmental Quality Act (CEQA). Three aspects of cultural resources are addressed in the staff analysis: prehistoric archaeological resources, historical resources, and ethnographic resources.

PREHISTORIC RESOURCES

Prehistoric archaeological resources are those materials related to prehistoric human occupation and use of an area. They may include sites and deposits, structures, artifacts, rock art, trails, and other remains of Native American presence. In California, the prehistoric period began more than 10,000 years ago and extended through the eighteenth century when the first Euroamerican explorers

visited California. While Native American cultural materials are typically categorized as “prehistoric,” it should be recognized that many groups and individuals maintained traditional lifeways well into his rical times, participating as employees on the ranches and in other enterprises.

HISTORIC RESOURCES

Historic resources are those which pertain to the period after the beginning of written records, usually beginning with Euroamerican exploration and settlement. They may be archaeological, in the form of wells, privies, trash deposits, or subsurface remains of structures or industries, or they may take the form of standing structures, features such as roads, historic landscapes such as those which result from extractive or other economic activities, or archival materials.

ETHNOGRAPHIC RESOURCES

Ethnographic resources are those materials important to the heritage of a particular ethnic or cultural group, such as Native Americans, African, European, or Asian immigrants. They may include traditional resource collecting areas, ceremonial site, topographic features, cemeteries, shrines, or ethnic neighborhoods and structures

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Cultural resources have been protected under the federal Antiquities Act since 1906 (Title 16, U. S. Code, Section 431 et seq.), with many subsequent enactments, regulations, policies, and guidelines, including standards for professional consultant qualifications. Portions of the project which may require a United States Army Corps of Engineers (USACE) 404 Permit would be regarded as an “undertaking” and therefore subject to compliance with Section 106 under the National Historic Preservation Act (NHPA). The State of California also has historic preservation laws and criteria for the evaluation of cultural resources; these are largely parallel to the federal measures. Projects licensed by the Energy Commission are reviewed to ensure compliance with these laws, as summarized below.

- National Environmental Policy Act (NEPA): Title 42, United States Code, Section 4321 et seq., requires federal agencies to consider potential environmental impacts of projects with federal involvement and to consider appropriate mitigation measures.
- Federal Register 48 44739-44738, 190 (September 30, 1983); updated 62 33708-33723 (June 20, 1997). Federal Guidelines for Historic Preservation Projects. The US Secretary of the Interior has published a set of Standards and Guidelines for Archaeology and Historic Preservation. These outline the appropriate professional methods and techniques for the preservation of archaeological and historical properties. The Secretary’s standards and guidelines are used by federal agencies, such as the Forest Service, the Bureau of Land Management, and the National Park Service. The State Historic Preservation Office refers to these standards in its requirements for selection of qualified personnel and in the mitigation of potential impacts to cultural resources on public lands in California.

- *National Historic Preservation Act 16 USC 470,* Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties through consultations beginning at the early stages of project planning. Regulations revised in 1997 (36 CFR Part 800 et. seq.) set forth procedures to be followed for determining eligibility for nomination, the nomination, and the listing of cultural resources in the National Register of Historic Places (NRHP). The eligibility criteria and the process are used by federal, state and local agencies in the evaluation of the significance of cultural resources. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the California State Register of Historic Resources. Recent revisions to Section 106 in 1999 have emphasized the importance of Native American consultation.
- Executive Order 11593, "Protection of the Cultural Environment," May 13, 1971 (36 Federal Register 8921) orders the protection and enhancement of the cultural environment by providing leadership, establishing state offices of historic preservation, and developing criteria for assessing resource values.
- American Indian Religious Freedom Act: Title 42, United States Code, section 1996 protects Native American religious practices, ethnic heritage sites, and land uses.
- Native American Graves Protection and Repatriation Act (1990): Title 25, United States Code, Section 3001, et seq. This Act defines "cultural items," "sacred objects," and "objects of cultural patrimony"; establishes an ownership hierarchy; provides for review; allows excavation of human remains, but stipulates return of the remains according to ownership; sets penalties; calls for inventories; and provides for return of specified cultural items.

STATE

- Public Resources Code, Section 5020.1 defines several terms, including the following:

  (j) "Historical resource" includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.

  (q) "Substantial adverse change" means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.

- Public Resources Code, Section 5024.1 establishes the California Register of Historical Resources; sets forth criteria to determine significance; defines eligible properties; and lists nomination procedures. The criteria are essentially the same as for eligibility to the NRHP, but stipulate that some properties which may not retain sufficient integrity to meet NRHP standards, may still be eligible for the California Register.

- Title 14, California Code of Regulations, Section 4852(c) explains that a resource that has lost its historic character or appearance may still have sufficient integrity for the California Register.

- Public Resources Code, Section 5097.5 states that any unauthorized removal or destruction of archaeologic or paleontologic resources on sites located on public land is a misdemeanor. As used in this section, “public lands” means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority or public corporation, or any agency thereof.

- Public Resources Code, Section 5097.98 defines procedures for notification of discovery of Native American human remains and for the disposition of human remains and associated grave goods.

- Public Resources Code, Section 5097.99 prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and sets penalties for these actions.

- Public Resources Code, Section 5097.991 states that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated.

- Public Resources Code, Section 21000, et seq., California Environmental Quality Act (CEQA). This act requires the analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.

- Public Resources Code, Section 21083.2 states that if a project may affect a resource that has not met the definition of an historical resource as set forth in Section 21084, then the lead agency may determine whether the project may have a significant effect on such resources. If a potential for damage to unique resources can be demonstrated, such resources must be avoided; if they can not be avoided mitigation measures shall be required. The law also discusses excavation as mitigation; discussed the costs of mitigation for several types of projects; sets time frames for excavation; defines “unique” and non-unique” archaeological resources; provides for mitigation of unexpected resources; and sets financial limitations for this section.

- 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 15064.5 addresses the significance of impacts to archaeological and historical

resources. Subsection (a) defines the term “historical resources.” Subsection (b) explains when a project may be deemed to have a significant effect and defines terms. Subsection (c) describes CEQA’s relevance to archaeological sites. If a resource is found to be an historical resource, Public Resources Code 21083.2 does not apply.

- CEQA Guidelines, Title 14, California Code of Regulations, Section 15064.7, “Thresholds of Significance.” This section encourages agencies to develop thresholds of significance to be used in determining potential impacts and defines the term “cumulatively significant.”

- CEQA Guidelines, Title 14, California Code of Regulations, Section 15126.4, “Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects.” Subsection (b) discusses impacts of maintenance, repair, stabilization, restoration, conservation, or reconstruction of a historical resource. Subsection (b) also discusses mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place; alternatives include documentation or data recovery by scientific excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.

- CEQA Guidelines, Appendix G: “Issue V: Cultural Resources.” Lists four questions to be answered in determining the potential for a project to impact archaeological, historical, and paleontological resources.

- California Penal Code, Section 622.5: Anyone who willfully damages an object or thing of archaeological or historic interest can be found guilty of a misdemeanor.

- California Health and Safety Code, Section 7050.5. If human remains are discovered during earth disturbing activities or construction, the project owner is required to contact the county coroner.

- Public Resources Code, Section 5097.98. If the county coroner determines that the remains are Native American, the coroner is required to contact the Native American Heritage Commission, which is then required to determine the “Most Likely Descendant” to inspect the burial and to make recommendations for treatment or disposition of the remains and any associated burial items.

LOCAL

Although the Energy Commission has pre-emptive authority over local laws, it typically ensures compliance with local laws, ordinances, regulations, standards, plans, and policies. The project site and associated linear facilities are all located within unincorporated portions of southern Kern County.

KERN COUNTY

General provisions of the Kern County General Plan of 1994 require maintenance of a County inventory of areas with potential cultural and archaeological significance.

SETTING

REGIONAL DESCRIPTION

The Cuyama Valley is at the southern end of the San Joaquin Valley, which in turn comprises the southern two-thirds of the greater Great Valley province (PEF 1999a, p. 5.3-1). The San Joaquin Valley in general is a northwest-trending structural basin filled with deep sediments laid down during the Late Cretaceous and Cenozoic time. Laced with active and potentially active geologic faults, the underlying rock units are largely of marine origin. The topography of the valley floor is generally flat, lying at the base of the Tehachapi Mountains. The hills are in the rain shadow of the Coast Ranges and receive little precipitation.

PROJECT VICINITY DESCRIPTION

The proposed project site is located 8 miles east of Grapevine, California and Interstate 5, 32 miles south-southeast of Bakersfield (PEF/Ray 1999a, p. J2). It is approached from Interstate 5 on the Edmonston Pumping Plant Road. It is on a north-dipping surface of the alluvial fan of Pastoria Creek, which flows north-northwestward within 1000 feet west of the plant site (PEF 1999a, p. 5.3-2). The region has a long growing season with low to moderate precipitation occurring primarily from mid-fall to mid-spring. The natural vegetation of the area includes grasses, brush, and trees. Current land uses in the area include grazing, agricultural, undeveloped, and oil and gas development (PEF 1999a, pp. 5.4-1 to 5.4-4). Biological habitat types along the linear facilities include non-native grasslands, with freshwater marsh and riparian scrub along the banks of Pastoria Creek and ephemeral drainages (PEF 1999a, p. 5.6-1). Refer to the **Project Description** section of this Preliminary Staff Analysis for additional information and maps of the project Area.

PREHISTORIC BACKGROUND

Archaeological data for the PEF and general vicinity are scarce because the proposed facility is on the private property of the Tejon Ranch and few investigations have been done. The overview presented is derived largely from what is known from prior research centered on resources at Buena Vista and Tulare Lakes, and from newer studies conducted in support of the Elk Hills Power Project (Jackson et al. 1997, 1998).

There is scattered evidence of Early Holocene Paleoindian (~12,000-8000 before present) presence in the southern San Joaquin Valley, particularly around the relict shorelines of the ancient lakes. Such evidence consists of fluted projectile points, flaked stone crescents, choppers, and other typologically early stone tools. Renewed excavation of CA-KER-116 at Buena Vista has demonstrated the

potential for deeply buried cultural material, and comparable early materials have been encountered at the Witt site at Lake Tulare (PEF 2000d, p.8).

The types of tools recovered from the earliest sites suggest that the Paleoindian culture was based on the hunting and butchering of large game animals. A middle period is characterized by a shift from a hunting to a plant-based economy, while the third archaeological period representing the Yokuts Indians and their antecedents revealed a further shift into a more diversified subsistence pattern based on more intensive exploitation of a variety of environments (Wallace 1978, p. 449).

ETHNOGRAPHIC BACKGROUND

When the Spanish explorers arrived, the project area was occupied by the Southern Yokuts. The environment supported a varied diet including fish, waterfowl, plants such as tule roots, seeds, shellfish, rabbits, and to a lesser degree than elsewhere in California, acorns from foothills of the Tehachapi Mountains. The Yokuts in the project area were known variously as the Yauelmani, Tejoneños, or Talinin. The most southern village, *Tinliu*, was on Paseo Creek near the Tejon Ranch House. The Tejon Rancheria was abandoned in 1859, and the population was relocated to the Tule River where a reservation was established in 1873. The reservation population numbered 154 in 1905, and approximately 325 Yokuts in 1970.

Cultural and geographic boundaries between the Yokuts and the Chumash overlap in the southern San Joaquin Valley. The Kitanemuk (or, Alliklik) group of Chumash were said to have ranged widely across the Tejon Ranch property from Castac Lake through the upper reaches of Pastoria and Tunas Creeks, with occupation at the foot of Grapevine Canyon and possibly also with the Yokuts at *Tinliu* (PEF/Ray 1999a, p. J7-11).

HISTORIC BACKGROUND

The first Spanish explorers encountered the Southern Yokuts, whose homeland included Tulare, Buena Vista, and Kern lakes, their connecting sloughs, and lower portions of the contributing rivers (PEF/Ray 1999a, p. J7). The Spanish did not undertake settlement or found missions in the interior valleys, and the subsequent Mexican government made only a few grants in the Valley during the 1830s. One of the earliest, and the largest in the San Joaquin Valley with 97,616 acres, was the Rancho Tejon established in 1843. General Edward Fitzgerald Beale, then Superintendent of Indian Affairs, established the Sebastian Indian Reservation (also called Tejon Reservation) on the rancho in 1853. Fort Tejon in Grapevine Canyon at Interstate 5 was maintained by the U. S. Army from 1854 to 1864, to oversee the Native Americans living on the reservation, and also to protect both the Euroamerican settlers and Native Americans from other marauding tribes (PEF/Ray 1999a,p. J12).

After the reservation was closed in 1865, Beale purchased the ranch from the original grantees, Ignacio del Valle and Juan Temple. His original stone and adobe buildings on Arroyo del Paso were used as rancho headquarters until the Tehachapi earthquake of 1852; new headquarters were later built on the site of old Fort Tejon.

The Tejon Ranch Company now covers nearly 270,000 acres and operates real estate, livestock, farming, and resource management divisions (PEF/Ray 1999a, p. J12). Remains of oil fields and power lines suggest the pattern of early developments.

RESOURCES INVENTORY

LITERATURE AND RECORDS SEARCH

Prior to preparation of the AFC, the applicant's consultant conducted a literature search at the Southern San Joaquin Valley Information Center of the California Historical Resources Information System (CHRIS) to compile existing culture resource data. Within 0.5 mile radius of project facilities, 12 studies and nine archaeological sites were on file at the CHRIS. Of the known sites, four were milling stone (food processing) complexes, two were burial locations, and one was possibly the ethnographic village of *Cheut Pahbe* (PEF/Ray 1999a, p. J13). None had been formally evaluated according to criteria for eligibility to the National Register of Historic Places. A single historical site was within the project footprint; P-15-003544 is an historic road dating back to the mid-1800s, used primarily for herding sheep and intercepting Jack's Camp, named after a Basque shepherd. The recorder in 1993 felt that this was not a significant site. Project facilities cross the California Aqueduct, a recorded archaeological site. Designated state landmarks outside of the project footprint include Fort Tejon State Historic Park (No. 129), the Sebastian Indian Reservation (No. 133).

FIELD SURVEYS

Prior to preparation of the AFC, the applicant conducted a field survey from July 26 to August 4, 1999, covering the plant site, laydown area, and Routes 1, 2A, and 5 as a block, 100 feet on each side of the proposed centerline of linear facilities, and certain "localized geographic nuances" such as drainage areas (PEF/Ray 1999a, pp. J16-17). The transect interval was 20 meters. Ten newly observed archaeological sites and 10 isolates were recorded with temporary numbers. Permanent trinomials have not yet been received.

Four of the new sites, either within or adjacent to the APE of the proposed project or project linears were recommended for testing to evaluate their significance. A *Cultural Resources Test Plan* was submitted in March 2000 (PEF/Thompson 2000d), and preliminary results were submitted in April 2000 (PEF/Thompson 2000i).

POWER PLANT SITE AND ADJACENT LINEAR FACILITIES

The proposed PEF plant site is located on 30 acres, and the laydown area will cover an adjacent 25 acres to the south. Both had a grassy cover during the survey which limited visibility to less than 15 percent. The terrain slopes gently toward the north, and the soils appear to be podsols and sandy Pleistocene alluvium associated with the Pastoria Creek drainage. The survey was negative for cultural resources, the

closest resource being an isolated bedrock milling feature (ISO 4) within Pastoria Creek, outside of the project footprint south of the laydown area.

ROUTE 1, PROPOSED 230 KV TRANSMISSION LINE

The double circuit 230 kV transmission line will be 1.38 miles long, extending from the high voltage switchyard located south of the power plant site to its connection with the existing Southern California Edison Pastoria Substation. The overhead line will utilize lattice steel towers ranging in height from 100 to 120 feet, spaced an average of 650 feet apart. The type of concrete foundations will be determined during detail design. Installation will require excavation for foundations, placement of reinforcing steel for the foundations, setting the foundation concrete and anchoring equipment, and erecting the structures and lines.

Survey along the transmission line corridor encountered three new archaeological sites and one isolated cultural resource. TR 1, a bedrock milling complex on granite boulders and bedrock outcrops, and ISO 3, a mano, were recorded along the interconnect between the Pastoria and Edmonston Substations, although this segment of Route 1 has been dropped from the final project description. Site TR 2, a series of milling features on granite boulders and bedrock outcrops, is adjacent to the east side of the alignment, and TR 3, a milling complex including a cupule boulder, abuts the east side of the transmission corridor.

Seven shovel test pits (STPs) 35 cm in diameter were excavated at TR 3 to an average depth of about 60 cm. Subsoils revealed rootlet intrusion, bioturbation, and flecks of charcoal interrupted as the result of grassfires. A single retouched quartz flake recovered in one STP in the 20-30 cm level represented the only cultural material. No formal evaluation of significance was stated in the preliminary report of testing, but because of the site's proximity to Pastoria Creek and the presence of the milling features on the surface, the consultant recommended monitoring in this area (PEF/Thompson 2000d, p.4).

ROUTE 2A, PROPOSED WATER SUPPLY LINE

Proposed water supply line Route 2A, replaced the original Route 2. Water will be brought to the plant site through an underground pipeline 0.15 mile long and 24 inches in diameter which enters the plant site at its northwest corner. It was surveyed during the block survey of the main facility. Surface visibility was less than 10 percent. No cultural resources were observed.

ROUTE 3, PROPOSED FUEL GAS PIPELINE

Natural gas will be conveyed to the PEF plant from the existing Kern River-Mojave pipeline through a pipeline 16 to 24 inches in diameter approximately 11.7 miles long. The route is generally north-south, and portions follow along the shoulders of farm and fire roads. In grasslands and orchards, visibility was less than 15 percent, but better along the shoulders of Sebastian Road. Some areas could not be surveyed because of recent pesticide spraying, dense crops, or agricultural rows perpendicular to the survey corridor.

Three new sites and one isolate were recorded. ISO 8 is a single whole, pierced *Olivella* shell which did not merit further consideration. TR 4 and TR 6 are both milling complexes adjacent to watercourses on the east side of the pipeline alignment, and TR 5 is an extensive milling complex covering at least 200 by 650 meters which straddles the APE. Due to time constraints and site size, the eastern and western boundaries were not established. The surveyors recorded 61 boulders with from 1 to 8 mortars on each, one *Olivella* bead and one chert flake (PEF/Ray 1999a, site record). Testing was recommended for all three sites.

TR 4 was tested with eight STPs reaching depths from 45 to 70 cm. All levels were sterile, other than flecks of charcoal interpreted as the natural results of grassfires.

TR 5 was examined more thoroughly on the assumption that the site might be eligible for the NRHP. Three 1 x 1 m test units were excavated within the APE, with three additional 50 x 50 cm units outside the project footprint. All units encountered cultural materials such as shell and limestone beads, projectile points, other stone tools and fragments, ground stone, fire-affected rock, and charcoal chunks and flecks. Assuming that the site is potentially eligible for the NRHP, an alternative alignment to avoid the site was sought. Fifteen backhoe trenches measuring 3.5 meters long and as much as 4.5 feet deep were dug along the western shoulder of the Tejon Ranch access road. The test trenches were sterile of cultural remains, attributed to disturbance by maintenance and stripping of the dirt road. The consultant recommends monitoring through this sensitive area.

TR 6 is another milling locus within the APE near a seasonal drainage. Five STPs were excavated between two of the milling features, sampling both the proposed centerline of the gas pipeline and the construction APE. The tests reached 70 to 80 cm in depth, where they were terminated due to difficulty in sampling the alluvial silts. All levels were negative for cultural resources. The consultant recommended confining construction and laydown activities to the defined corridor and monitoring of ground disturbing activities in the immediate area.

ROUTE 5, PLANT SITE ACCESS ROAD

As proposed, the plant site will be accessed by a road running northerly from Edmonston Pumping Plant Road for a distance of 0.85 mile. When surveyed as part of the block survey covering the project site and immediate facilities, the road corridor was covered by grass and showed disturbance from ground squirrels. Other than some exposures near the creek drainage, visibility was less than 10 percent. No cultural resources were recorded within the APE. Four isolated milling resources (ISOs 4, 9, and 10) were recorded outside of the project footprint.

NATIVE AMERICAN CONTACTS

The applicant consulted with the Native American Heritage Commission (NAHC), and sent letters and maps to 10 groups and individuals recommended by NAHC as those who might have knowledge or concern of cultural resources within or near the project area. The NAHC files did not contain any references to this PEF in the Sacred Lands File. Responses were received from two individuals who expressed concern about the Old Sebastian Reservation, the ethnographic village of *Pahbe* or

Checot, the area of Lake Misjamin said to have been occupied by the Tulamni, and the location of *Mitochea* visited by the Spanish explorers. From subsequent correspondence and consultant research, the localities of *Pahbe* and Lake Misjamin and are believed to be outside of the project area. The general location of *Mitochea* may correspond to P-15-002185 and P-15-002186, which are both south of Route 1, and to newly recorded TR 1, TR 2, and TR 3 (PEF/Ray 1999a, p 14 and Appendix D). TR 1 and TR 2 are beyond the east side of the footprint of Route 1. TR 3 has been tested, and measures proposed to avoid any impact.

The original Native American respondents were asked to recommend appropriate alternate monitors if they could not participate. Native American monitors were on-site during all sub-surface activities. A rotation system was used to allow all concerned and interested Native Americans to observe. Three Native American monitors were on site a total of nine days during the testing. Procedures were in place for the proper treatment of Native American remains pursuant to Public Resources Code 5097.98, but no remains were found (PEF/Thompson 2000l, p.3).

SUMMARY OF PREVIOUSLY IDENTIFIED CULTURAL RESOURCES IN THE PROJECT VICINITY

From existing records of previous investigations, nine archaeological sites were known within 0.5 mile of the project footprint. Most included, or were associated with, milling stations on granite boulders or bedrock outcrops. Two were burial sites. The only previously known site actually within the PEF footprint was an historic dirt road, which the recorder felt was not potentially eligible to the NRHP. Of the three sites newly recorded during the applicant's survey of Route 1, only TR 3 was within the project footprint, and this was subject to testing. Sites TR 4, 5, and 6 were within or closely adjacent to Route 3, and all were tested. All other sites were outside the project footprint or along alternate routes that were dropped from consideration for the project, and the isolates did not warrant further consideration.

Structural remains included oil extraction sites, insulators on an alignment suggestive of an old power line, and four houses (TR 10) which were not subject to historical research or architectural documentation.

Significance, as measured by eligibility to the NRHP, has not been formally determined for any of the cultural resources. An earlier investigation concluded that the historical road (P-15-003544) has lost its integrity through some upgrading and current use. Site TR-10, the insulators and historical road (P-15-003544) were identified along routes that were dropped from consideration for the project. The preliminary report of by the applicant's consultant of test excavations did not include analysis of significance beyond stating that TR 5 is potentially eligible (PEF/Thompson 2000d).

CATEGORIZATION OF IDENTIFIED CULTURAL RESOURCES

Various laws apply to the treatment of cultural resources. These laws require the Energy Commission to categorize resources by determining whether they meet several sets of specified criteria. These categories then in turn influence the analysis of potential impacts to the resources and the mitigation that may be required to ameliorate any such impacts.

Under federal law, only historical or prehistoric sites, objects, or features, or architectural resources that are assessed by a qualified researcher as “important” or “significant” in accordance with federal guidelines need to be considered regarding potential impacts. The significance of historical and prehistoric cultural resources is judged in accordance with the criteria for eligibility for nomination to the National Register of Historic Places as defined in 36 CFR 60.4. If such resources are determined to be significant, and therefore eligible for listing in the National Register, as well as the California Register, they are afforded consideration under the National Historic Preservation Act and/or 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 (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 of statewide importance.

Under federal law, 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 protection. However, occasionally certain resources, although they may not be assessed as eligible for NRHP or CRHR may nonetheless be of local or regional importance such that mitigation may be warranted regardless of their assessed eligibility. Staff evaluates the survey reports and site records for any known resources located within or adjacent to the project APE to determine whether they meet the eligibility criteria.

The record and literature search and the walking surveys of the proposed project APE were conducted to identify the presence of any cultural resource sites or materials. Where resources were identified, additional evaluation would be conducted to determine whether the resources are already listed on, or are potentially eligible for listing on, either the National Register of Historic Places (National Register) [36 CFR 800] or the California Register of Historic Resources. The determination of eligibility is made in compliance with the applicable provisions of the National Historic Preservation Act.

Beginning in 1999, the California State Resources Agency adopted considerable revisions to the regulations implementing CEQA. These changes affected the language applicable to staff’s analysis of cultural resources. Previously, the bulk of the information on how to assess resource and impact significance and on the types of mitigation measures available was contained in Appendix K of the CEQA Guidelines. Much of the language of that appendix has now been incorporated into Title 14, California Code of Regulations, Section 15126.4 and 15064.5.

The CEQA Guidelines now explicitly require the lead agency (in this case, the Energy Commission) to make a determination of whether a proposed project will affect "historic resources." The guidelines provide a definition for historic resources and set forth a listing of criteria for making this determination. As used in CEQA, the term "historic resources" includes any resource, regardless of age, as long as it meets these criteria. If the criteria are met, the Energy Commission must evaluate whether the project will cause a "substantial adverse change in the significance of the historic resource," which the regulation define as a significant effect on the environment. The recent CEQA changes also indicate that the mitigation for impacts to historic resources that meet these criteria shall not be subject to the limitations provided in PRC Section 21083.2.

Using the above criteria, staff has determined that the cultural resource sites described in the AFC and in subsequent filings for the PEF project meet one or more of the criteria for being an historical resource. As such, staff recommends full mitigation during project construction and operation activities, in order to protect these resources.

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 prohibition in this section does not apply when an archeological resource has already met the definition of a historical resource (California Code of Regulations, Section 15064.5). Since staff has determined that the sites for which it is recommending mitigation do meet the definition of historical resources, the prohibition does not apply to the mitigation discussed in this staff assessment.

IMPACTS

Since project development and construction usually entail surface and subsurface disturbance of the ground, the proposed Pastoria Energy Facility has the potential to cause an adverse effect on both known and previously unknown cultural resources. Project-related impacts may be categorized in several, inter-related ways. Impacts to cultural resources may either be temporary or permanent effects that could be associated with site preparation, project construction, project operation, and/or project closure. Project-related impacts may also result either directly or indirectly during the pre-construction, construction, operation, and/or closure of the project.

Temporary effects occur primarily during those phases of the project associated with disturbance or use of the ground surface during pre-construction vegetation removal and site preparation, and during activities associated with the construction and use of parking or storage areas, conductor pulling sites, or laydown sites. Potential adverse changes to a cultural resource may occur if sensitive resource areas are subject to personal or vehicular traffic, parking, or storage because any

resources present at the surface could be dislocated or damaged. Typically, once the activity is completed, the potential for impacts is alleviated.

The potential for permanent effects to occur to cultural resources would be related to such project activities as grading, cutting and filling, excavation, trenching, augering, pile driving, or other pre-construction or construction process which disturbs, removes, or destroys an historic property. Permanent effects may also be caused by damage or disturbance of previously unknown resources that are unexpectedly encountered during earth disturbing activities or construction. Permanent effects on sites within or away from the APE may result from the construction and use of new access roads to an area previously inaccessible, ongoing maintenance to pipelines and other linear facilities, implementation of measures away from the project footprint to mitigate impacts on biological or other resources, flood control, or response to emergency situations.

According to CEQA Guidelines, direct impacts are defined as those impacts that are directly attributable to the project and which occur at the same time and place. 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, or excavation.

Indirect impacts are those which may result from increased erosion as a result of site clearance and preparation, management of the biological habitat, or from inadvertent damage or outright vandalism to exposed cultural materials within or outside of the APE due to increased accessibility to sensitive resource areas.

POTENTIAL FOR PROJECT IMPACTS

The potential for project construction or earth disturbing activities to impact previously unknown cultural resources cannot be fully evaluated until the subsurface soils are exposed by excavation, trenching, and/or augering. A prediction of the potential for discovery of cultural resources can be made, based on the results of literature review and field investigations. The numerous sites already known on or near portions of the project site or the linear facility routes, the recorded occurrence of numerous isolates, and the evidence of human habitation over a period of thousands of years, either on or in proximity to the proposed project, indicate that construction of the PEF has the potential to encounter previously unrecorded cultural resources. Some will have been buried by the natural sedimentation on the flood plain, while surface evidence of others has been obscured or removed during subsequent or sequential historical uses of the property.

Thus, the potential for PEF to impact previously unknown cultural resources is directly related to the likelihood that such resources are present, whether they are actually encountered during project development, and the measures set in place to avoid or reduce such impacts to an insignificant level. Based upon the Warren-Alquist Act and the Energy Commission siting regulations, the Commission staff must evaluate the potential for significant impacts to cultural resources. Based upon CEQA, staff must evaluate the potential for adverse changes in the

significance of historic resources. Not all cultural resources are the same, nor do they offer the same degree of information or insight into past human activities and adaptations to their environment.

Professional experience, the literature, the records of previously discovered cultural resources, and reference to a regional research design all contribute to the assessment of the importance of a newly discovered site or an unanticipated subsurface resource. Significant cultural resources are those that meet established and generally accepted scientific criteria, or that possess special values to a community or national/ethnic group, contain human remains, or that contribute to an historical landscape. The significance of any cultural resource sites, or materials recovered during project construction, is evaluated by a qualified cultural resource specialist and often can only be assessed after the sites have been mapped and recorded, collected, usually tested, analyzed, and reports prepared by professional archaeologists, historians, architectural historians, industrial specialists, and/or other consultants as the nature of the site may warrant. Determinations of eligibility are made by the Office of Historic Preservation (OHP) under Section 106. OHP reviews the findings and the findings and forwards potentially eligible historic resource nominations for the California Register to the State Historic Resources Commissionn.

For the purposes of this analysis, potentially significant impacts to an archaeological, historical, or cultural resource are defined as project impacts which would:

- Demolish or materially alter in an adverse manner those physical characteristics of a resource that convey its historical significance and that justify its inclusion in, or eligibility for the California Register of Historical Resources (CEQA, PRC Section 15064.5);
- Demolish or materially alter in an adverse manner those physical characteristics that account for its inclusion in a local register or historical resources pursuant to local ordinance or resolution (PRC, Section 5020.1(k)), or its identification in a historical resources survey meeting the requirements of PRC, Section 5024.1(g), unless the preponderance of the evidence demonstrates that the resource is not historically or culturally significant.

The lead agency must address two questions: 1) Is there a significant resource that may be impacted by the proposed project? 2) Will the project cause a substantial adverse change to the extent that the values of the resource which contributed to its importance are impaired or lost? CEQA specifically states that a resource need not be listed on any register to be found significant (PRC Section 21084.1).

The AFC and supplementary filings indicate that nine sites had previously been recorded within 0.5 mile of the project area, and the applicant's survey of a 200-foot corridor added 10 additional sites and 10 isolates within the PEF footprint. After identifying sites outside the project footprint and subtracting sites that were previously identified near linears now removed from consideration, four sites remained within the APE that required testing. Kern County is an area that is

extremely rich in both prehistoric and historic resources. Literature searches and surface surveys are often merely clues pointing to previously identified sites or areas likely to contain cultural resources.

For this project, the majority of potential impacts to cultural resources would be associated with the pre-construction earth disturbance and construction phase. Since project development and construction will entail surface and subsurface disturbance of the ground, the proposed PEF project has the potential to impact known, as well as previously unknown, cultural resources. However, the normal day to day operations are not expected to have any significant impacts on the region's cultural resources. Staff has proposed mitigation measures that address the potential for impacts to both known and unknown resources. Given the sensitivity of much of the area for the presence of cultural resources, it is likely that additional cultural resources may be discovered during construction. At this time the number of sites that cannot be avoided is unclear. The objective is to avoid cultural resources if possible. When unanticipated resources are encountered, archaeological methods will be used to confirm the presence; define the boundaries, contents, integrity, and research potential; and evaluate their significance, in conjunction with Energy Commission staff.

POWER PLANT SITE AND CONSTRUCTION LAYDOWN AREA

No potentially significant cultural resources have been observed within the area covered by the block survey. Three isolated milling stations were recorded outside of the footprint, west and south of the main facility; these do not ordinarily merit further consideration and no impacts are predicted unless unanticipated sites are observed during project development.

ROUTE 1, PROPOSED 230 KV TRANSMISSION LINE

Site TR 3 is within the survey corridor and directly adjacent to the Pastoria Substation Access Road, where substantial traffic may be expected. The impression during survey was that the resource appeared to be significant because of its extensive size and features (PEF/Ray 1999a, p. J-29). The results of seven STPs were largely negative, but no formal opinion about significance was advanced (PEF/Thompson 2000d, p.4). The consultant stated that there would no impact if construction and maintenance are strictly confined to the 200-foot wide corridor, and that monitoring should be provided.

ROUTE 2A, PROPOSED WATER SUPPLY LINE

The proposed water supply line route was originally surveyed as part of the block survey which included the deleted Route 4. No resources were relocated or identified during the original survey. No impacts are likely.

ROUTE 3, PROPOSED FUEL GAS PIPELINE

The single isolate (ISO 8) is outside the survey corridor, and not regarded as a significant resource to warrant further consideration. Three archaeological sites warranted testing to evaluate significance because of the potential for impacts. The sampling at TR 4 within the proposed gas line corridor did not yield cultural material.

On the basis of this site in the northern portion of the site, there should be no impact if construction and maintenance are strictly confined to a 20-foot wide corridor. URS was advised that there might be a slight diversion of the pipeline to the south of the existing Tejon Ranch dirt access road corridor. There is an expansive, unrecorded archaeological site which would be impacted by such a diversion.

TR 5 is bisected by the proposed gas pipeline, and testing confirmed the earlier opinion that this is a potentially eligible site. Construction of the pipeline as presently planned would constitute a significant impact. Trenching was conducted along the shoulder of the Tejon Ranch access road to evaluate al alternative alignment to avoid such impact. Test trenches did not contain cultural materials, and this alternate was recommended to avoid impacting the site.

The testing at TR 6 was conducted between two surface bedrock milling features, and the (STP) s proved sterile. The investigators concluded that there will be no impact if laydown, construction, and maintenance activities are restricted to the confined corridor as presently proposed (PEF/Thompson 2000d, pp. 6-7).

ROUTE 5, PLANT SITE ACCESS ROAD

The three recorded isolates are not deemed to be significant, and are outside of the survey corridor. No impacts are likely.

CUMULATIVE IMPACTS

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 Energy Commission has certified one power generation project (La Paloma, Oct. 1999), and is currently reviewing, or anticipates receiving for review, at least four large power generation projects, all proposed for construction of southern Kern County.

Proposed developments such as these large power generation projects and associated linear facilities, and ongoing oil field and agricultural production, are extending farther out into the southern San Joaquin Valley. The combined effects of this development can accelerate the potential for continued disturbance of cultural resource sites, the loss of significant information, and alteration of an historical landscape. The level of cumulative impact will grow as increasing development opens more undisturbed areas and eventually exposes highly sensitive cultural resource sites. Examples of the increasing residential and commercial pressures bringing growth to southern Kern County include plans by IKEA to build one of California's largest structures as a distribution point in Tejon Ranch Co.'s new industrial park north of the PEF, and the ranch's plan to develop a 400-acre residential community on the southern edge of its property. There is increasing potential that important resources will be inadvertently lost or destroyed. Implementation of appropriate mitigation measures is essential to the protection of valuable cultural resources and for the recovery of information about important regional issues.

The incremental effect of this project is likely to contribute to a significant cumulative impact on Routes 5 and 99, and increase traffic off the highways as people seek recreation and open space. The level of cumulative impact will grow as increased development opens previously undisturbed, undeveloped areas and exposes sensitive cultural resource areas. Another kind of incremental effect is represented by the California Aqueduct, recorded as an archaeological site but increasingly affected by developments related to utilities, transportation, commercial and residential growth.

At this time, the process of defining site boundaries and determining site significance is still underway, and the full inventory of significant cultural resources may only be completed during the construction phase. The applicant can mitigate impacts to both undetermined and identified sites to less than significant by following staff's recommendations for monitoring and mitigation set forth in the conditions of certification.

FACILITY CLOSURE

The anticipated life of the PEF is projected as at least 25 years. Upgrades or modifications made during that span might extend the life of the facility. Closure could be caused by (1) either a natural or manmade disaster or economic difficulty, or (2) a planned, orderly closure when the plant becomes economically non-competitive.

PLANNED CLOSURE

At the time of closure, all then-applicable LORS will be identified and the Energy Commission-required closure plan 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 more likely to depend upon the final location of project structures in relation to existing resources than 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 forecast at this time, no conclusion can be drawn at present about the possible impact of facility closure on cultural resources.

TEMPORARY CLOSURE

According to the AFC, an emergency unplanned closure would probably be temporary. The applicant's plan, if this type of closure occurs, would be to keep everything ready to resume operations as soon as the emergency is over. In this sort of situation, there is unlikely to be any impact to cultural resources unless the emergency response might require traffic over unsurveyed areas or disturbance to sites which had not been considered subject to impact. A contingency plan for temporary cessation of operation would ensure compliance with all applicable LORS. A temporary closure where there is no release of hazardous materials would require provision for 24-hour security.

UNEXPECTED PERMANENT CLOSURE

If a site were simply abandoned, impact to cultural resources would be unlikely because there would be no immediate soil disturbances. Alternatively, the removal or demolition of structures, or different use of the land, might affect cultural resources. 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.

MITIGATION

The AFC indicates that numerous historic and prehistoric sites and numerous isolates have previously been found on the surface within the study corridor of the project area. Since project development and construction usually entail disturbance of the ground surface, as well as disturbance below the surface, the proposed project has the potential for subsurface excavation to encounter buried or obscured cultural resources. The presence of cultural resource materials beneath the surface of the project area is difficult to determine until the ground is opened by excavation, trenching, or augering, so the extent of potential impacts often cannot easily be evaluated prior to construction. The applicant intends to use archaeological methods to determine the presence of sites and avoid them, if possible.

The preferred mitigation for impacts to cultural resources is preservation by avoiding areas where cultural resources are known to exist, wherever possible. When avoidance cannot be achieved, alternate measures such as surface collection, subsurface testing and evaluation, and data recovery of significant sites must be implemented. If previously unknown cultural resources are encountered during site clearance and preparation, or during project construction, and they cannot be avoided, then contingency measures must be in place to react promptly to protect these resources and ameliorate the impacts to a level of not significant. Staff's objective is to ensure that there will be no adverse impacts to significant cultural resources during project development and construction. Critical to the success of any mitigation effort is the selection of a qualified professional cultural resources specialist. The designated specialist must have the authority to halt or redirect work in the vicinity of a site or structure until the resource is identified, evaluated, and treated, if warranted. Energy Commission staff must review the qualifications of the professional archaeologist(s) designated by the project owner to lead and participate in project monitoring, testing, and mitigation efforts. Given the nature of known resources, provision should be made for expertise in both prehistoric and historical archaeology.

APPLICANT'S PROPOSED MITIGATION

In the AFC, the applicant recommended specific mitigation measures that would apply to the known sites regarded as potentially eligible or to newly discovered cultural resources within the project APE (PEF/Ray 1999a, pp. J 34-37; PEF/Thompson 2000d). The mitigation measures provided in the AFC are summarized as follows:

PLANT SITE AND CONSTRUCTION LAYDOWN AREAS. A monitor should spot check the initial grading and construction activity.

ROUTE 1. Confine construction and maintenance activities to a 200-foot wide corridor in the vicinity of TR 3 to avoid the known, tested site. Monitor continuously between MP 0.9 and 1.1 to ensure that portions of this site are not impacted, and from MP 1.1 to MP 1.35 to prevent disturbance of TR 1 and TR 2, or in the event that subsurface resources are exposed during construction. A monitor should be present during construction of the towers or any new roads.

ROUTE 2A. An archaeological monitor should be present periodically to observe initial grading and excavation. If no undiscovered cultural resources are exposed, no further effort will be necessary.

ROUTE 3. Construction and maintenance should be confined to a 20-foot wide corridor north of the site to avoid impacts to TR 4. If the gas pipeline should be diverted to the south, a large undocumented site will need to be recorded and evaluated before additional recommendations can be made. Monitoring shall be required during ground disturbing in the immediate area of TR4. Site TR4 will fall under the jurisdiction of the USACE permit.

Complete avoidance is recommended for TR 5, and a different alignment along the Tejon Ranch access road was proposed as a preferred alternative. Construction, maintenance and laydown activities should be confined to the access road. The access road was tested using trenching. The trenching revealed only negative results. Monitoring will be required during earth disturbing activities in the immediate area of TR 5. Site TR 5 will fall under the jurisdiction of the USACE permit.

At TR 6, it was recommended that PEF construction and maintenance be confined within the proposed corridor to avoid impacts. Monitoring is required in the general vicinity of TR6 during ground disturbing activities.

ROUTE 5. An archaeological monitor should be present periodically to observe the initial grading and excavation, particularly near the location of ISOs 9 and 10.

NATIVE AMERICAN MONITORING

In order to ensure participation by the Native American community the consultant to the applicant recommends that a Native American monitor be present during archaeological site testing and/or data recovery operations at sites that appear to have a prehistoric or ethnographic component (PEF/Ray 1999a p. J-33).

STAFF'S PROPOSED MITIGATION MEASURES

Commission staff concurs with the mitigation measures proposed by the applicant in the AFC. In addition to the applicant's proposed mitigation, staff's recommendations have been incorporated into a series of conditions of certification

that are expected to reduce the potential for adverse project impacts on the region's cultural resources to a less than significant level.

Moreover, staff suggests that any known cultural resource sites should be avoided whenever possible. Staff recommends that sites for which significance has not been formally assessed, will be presumed to be important or significant until a determination of significance has been made and reviewed by OHP. Staff encourages the applicant to assume that any recorded sites that have not been formally evaluated for significance/importance, may retain integrity and are at minimum an "important" resource under CEQA, or are potentially eligible for listing on the National Register under 36 CFR 60.4(d), or are eligible for the California Register.

The proposed mitigation measures would apply to any potential for impacts to sensitive cultural resources in all areas affected by the project. Mitigation measures are derived from good professional practice and they are based on the US Secretary of the Interior's guidelines, and staff's recommendations. The mitigation measures set forth in the conditions have been applied to previous projects before the Energy Commission and they have been proven successful in protecting sensitive cultural resources from construction-related impacts, while allowing the timely completion of many projects throughout California.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The AFC reported an inventory of nine previously recorded sites within 0.5 mile of project facilities, only one of which was within the proposed project footprint. New survey added 10 isolates and 10 archaeological sites within the 200-foot wide corridor examined. None of the sites has been formally evaluated for eligibility to the NRHP; however, the site recorder believed that the historical road (P-15-003544) was not eligible, and the URS testing team concluded that site TR 5 is probably eligible.

Given the presence of the many milling complexes - some recorded as sites and smaller localities called isolates - the possibility exists that project construction could encounter additional, potentially significant cultural resources not presently visible from the surface. The presence of the isolates on a surface which has been subject to use, sedimentation, flooding, grazing, and agricultural modification can sometimes indicate the presence of additional resources below the surface or in proximity to the surface finds.

Mindful that some information is still to be supplied, and that there may be changes in the locations of routes or facilities, staff has incorporated the various cultural resource mitigation measures into a proposed set of conditions of certification for the Pastoria Energy Facility. These conditions are set forth as a series of steps or activities that are intended to be completed in a phased sequence, during project-related pre-construction, construction, post-construction, and operation activities.

For instance, the preparation of a monitoring and mitigation plan by the designated cultural resource specialist cannot take place until maps identifying the project footprint are completed, the designated specialist has been approved by the Energy Commission staff's Compliance Project Manager (CPM), and any necessary final surveys or site evaluations have been completed.

An applicant frequently anticipates starting project construction as soon as the Energy Commission's decision on certification. It is crucial to recognize that fast track construction cannot begin until the adopted Conditions of Certification have been complied with at the relevant segment. If the start of project construction begins immediately after certification, conditions with extended lead times must be initiated prior to certification.

Staff believes that if the recommendations and proposed conditions of certification are implemented by qualified professionals in a timely and proper manner, the project will be in compliance with the applicable LORS, and no significant adverse direct, indirect, or cumulative impacts to cultural resources will occur.

RECOMMENDATIONS

Staff recommends that the Commission adopt the following conditions of certification, which incorporate the mitigation measures discussed above and provide supporting detail.

CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of construction-related vegetation clearance, or earth disturbing activities or project site preparation; or the movement or parking of heavy equipment onto or over the project surface, the project owner shall provide the California Energy Commission (Energy Commission) Compliance Project Manager (CPM) with the name and statement of qualifications for its designated cultural resource specialist and alternate cultural resource specialist, if an alternate is proposed, who will be responsible for implementation of all cultural resources conditions of certification.

a) The statement of qualifications for the designated cultural resource specialist and alternate shall include all information needed to demonstrate that the specialist meets at least the minimum qualifications specified by the National Park Service, Heritage Preservation Services. Alternatively, the archaeologist shall be qualified by the Register of Professional Archaeologists (RPA). The minimum qualifications include the following:

a) a graduate degree in, archaeology, cultural resource management, cultural resource management, or a comparable field;
b) at least three years of archaeological resource evaluation, management, impact mitigation and field experience in California; and
c) at least one year's experience in each of the following areas:

1. leading archaeological resource field surveys;

2. leading site and artifact mapping, recording, and recovery operations;
3. marshaling and use of equipment necessary for cultural resource recovery and testing;
4. preparing recovered materials for analysis and identification;
5. determining the need for appropriate sampling and/or testing in the field and in the laboratory;
6. directing the analyses of mapped and recovered artifacts of both Native American and historical origin;
7. completing the identification and inventory of recovered cultural resource materials; and
8. preparing appropriate reports to be filed with the receiving curation repository, the State Historic Preservation Officer (SHPO), all appropriate regional information center(s) CHRIS.

The statement of qualifications for the designated cultural resource specialist shall include:

a) a list of specific projects the specialist has previously worked on;
b) the role and responsibilities of the specialist for each project listed; and
c) the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

If the designated specialist does not intend to personally supervise all surveys, studies, monitoring, or excavations, the principal shall designate the name and qualifications of a comparably alternate cultural resource specialist. The specialist shall also provide the names and qualifications of any potential consultants such as historian or architectural historian who may participate.

Verification: At least ninety (90) days prior to the start of construction-related vegetation clearance, or earth disturbing activities or project site preparation, or the movement or parking of heavy equipment onto or over the project surface, the project owner shall submit the name and statement of qualifications of its designated cultural resource specialist and alternate cultural resource specialist, if an alternate is proposed, to the CPM for review and written approval.

At least ten (10) days but no more than thirty (30) days prior to the start of any ground-disturbing action, the project owner shall confirm in writing to the CPM that the approved designated cultural resource specialist will be available at the start of earth disturbing activities and is prepared to implement the cultural resources conditions of certification.

At least ten (10) days prior to the termination or release of a designated cultural resource specialist or field director, the project owner shall obtain CPM approval of the replacement professionals by submitting to the CPM the name and resume of the proposed new designated individuals.

CUL-2 Prior to the start of any construction-related vegetation clearance, or earth disturbing activities or project site preparation, or the movement or parking of heavy equipment onto or over the project surface, the project owner shall provide the designated cultural resources specialist and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps provided will include the USGS 7.5 minute topographic quadrangle map and a map at an appropriate scale (e.g., 1:2000 or 1" = 200') for plotting individual artifacts. If the designated cultural resource specialist requests enlargements or strip maps for linear facility routes, the project owner shall provide them. In addition, the project owner shall provide a set of these maps to the CPM at the same time that they are provided to the specialist. If the footprint of the power plant or linear facilities changes, the project owner shall provide maps and drawings reflecting these changes, to the cultural resources specialist and the CPM within five days. Maps shall show the location of all areas where surface disturbance may be associated with project related access roads, and any other project components.

Verification: At least seventy-five (75) days prior to the start construction-related vegetation clearance, or earth disturbing activities or project site preparation on the project, or the movement or parking of heavy equipment onto or over the project surface, the project owner shall provide the designated cultural resources specialist and the CPM with the maps and drawings. Copies of maps or drawings reflecting changes to the footprint of the power plant and/or linear facilities shall be submitted to the cultural resources specialist and the CPM within five days of the changes.

CUL-3 rior to the start of construction-related vegetation clearance or earth disturbing activities, or project site preparation, or the movement or parking of heavy equipment onto or over the project surface, the designated cultural resources specialist shall prepare, and the project owner shall submit to the CPM for review and written approval, a Cultural Resources Monitoring and Mitigation Plan (CRMMP), identifying general and specific measures to minimize potential impacts to cultural resources within areas subject to project related earth disturbance. Approval of the CRMMP by the CPM shall occur prior to any vegetation clearance or other earth disturbing activities of construction or site preparation.

a) The Cultural Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:
b) A proposed research design for both prehistoric and historical archaeology that includes a discussion of questions that may be answered by the mapping, data and artifact recovery conducted during monitoring and mitigation activities, and by the analysis of recovered data and materials. It shall provide details of the data needed to address the research issues and the methods proposed to obtain such data.
c) A discussion of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the pre-construction, construction, and post-construction analysis phases of the project;

d) Identification of the person(s) expected to perform each of the tasks, a description of each team member's qualifications (please provide resumes) and responsibilities, the structure of the mitigation team, and the reporting relationships between project construction management and the monitoring and mitigation team. The cultural resources team shall include one member professionally qualified in historical or industrial archaeology;

e) A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, the areas where they will be needed, and their role and responsibilities;

f) A discussion of measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during pre-construction, construction and/or operation, and identification of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of earth disturbing activities and how long they will be needed to protect the resources from project-related effects;

g) A discussion of where monitoring of project activities is deemed necessary by the designated cultural resource specialist. Except in the following specified areas, the specialist will determine the size or extent of the areas where monitoring is to occur and will establish the percentage of the time that the monitor(s) will be present. Monitoring shall occur during earth disturbing activities or site preparation in the vicinity of TR 3, TR 4, TR 5 and TR 6. Identification of the monitoring requirement(s) will include areas where other specialists, e.g., biologists, may be conducting their own mitigating programs.

h) A discussion of the requirement that all cultural resources encountered will be recorded and mapped (may include photos) and all significant or diagnostic resources will be collected for analysis and eventual curation into a retrievable storage collection in a public repository or museum that meets the standards and requirements for the curation of cultural resources as set forth at Title 36 of the Federal Code of Regulations, Part 79;

i) A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during earth disturbing activities or construction;

j) Identification of the public institution that has agreed to receive any data and cultural resources recovered during project-related monitoring and mitigation work. Discussion of the requirements, specifications, or funding needed for the materials to be delivered for curation and how they will be met. Also include the name and phone number of the contact person at the institution; and

k) Identification of specific sites within the APE deemed potentially significant, or potentially subject to impact, which may need additional information and recommendations for subsurface testing, boundary definition, assessment by an archaeologist (qualified in prehistory or historical archaeology as appropriate), or concurrence of the existing evaluation by OHP in the light of new information.

Verification: At least sixty (60) days prior to the start any construction-related vegetation clearance or earth disturbing activities or project site preparation or the movement or parking of heavy equipment onto or over the project surface, the project owner shall provide the Cultural Resources Monitoring and Mitigation Plan, prepared by the designated cultural resource specialist, to the CPM for review and written approval.

CUL-4 Prior to the start of any construction-related vegetation clearance, or earth disturbing activities or project site preparation or the movement or parking of heavy equipment onto or over the project surface, the designated cultural resources specialist shall prepare an employee training program. The project owner shall submit the cultural resources training program to the CPM for review and written approval.

The training program shall discuss the potential to encounter cultural resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources. The program shall include the set of resource reporting procedures and work curtailment procedures that workers are to follow if previously unknown cultural resources are encountered during project activities. The training program shall be presented by the designated cultural resource specialist or qualified individual(s) approved by the CPM, and may be combined with other training programs prepared for biological resources, paleontologic resources, hazardous materials, or any other areas of interest or concern.

Verification: At least sixty (60) days prior to the start of construction-related vegetation clearance or earth disturbing activities or project site preparation, or the movement or parking of heavy equipment onto or over the project surface, the project owner shall submit to the CPM for review and written approval, the proposed employee training program, the set of reporting procedures, and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during earth disturbing activities or construction. The project owner shall provide the name and “resume” of the individual(s) performing the training.

CUL-5 Prior to the start of construction-related vegetation clearance, or earth disturbing activities or project site preparation or the movement or parking of heavy equipment onto or over the project surface and throughout the project construction period as needed for all new employees, the project owner shall ensure that the designated cultural resource trainer(s) provide(s) the CPM-approved cultural resources training to all project managers, construction supervisors, and workers. The project owner shall ensure that the designated trainer provides the workers with the CPM-approved set of procedures for reporting any sensitive resources that may be discovered during project-related ground disturbance and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during earth disturbing activities or construction.

Verification: Within seven (7) days of the start of construction-related vegetation clearance, or earth disturbing activities or project site preparation or the movement or parking of heavy equipment onto or over the project surface, the project owner

shall provide the CPM with documentation that the designated cultural resources trainer(s) has/have provided the CPM-approved cultural resources training and the set of reporting and work curtailment procedures to all project managers, construction supervisors, and workers hired before the start of earth disturbing activities

In each Monthly Compliance Report after the start of earth disturbing or earth moving activities, the project owner shall provide the CPM with documentation that the designated cultural resource trainer(s) has/have provided to all project managers hired in the month to which the report applies the CPM-approved cultural resources training and the set of reporting and work curtailment procedures.

CUL-6 The designated cultural resource specialist, alternate cultural resource specialist or the specialist's delegated monitor(s) shall have the authority to halt or redirect earth disturbing activities or construction if previously unknown cultural resource sites or materials are encountered during project-related land clearing, grading, augering, excavation or other earth disturbing activities. Cultural resources monitors shall be members of the cultural resources team with a background and experience appropriate to the project area being monitored.

If such resources are found and the specialist determines that they are not significant, the specialist will document the observations and assessment and may allow construction to resume. The project owner shall notify the CPM of the find as set forth in the Verification.

If such resources are found and, the specialist determines that they are or may be significant, the halting or redirection of earth disturbing activities or construction shall remain in effect until:

a) the designated cultural resources specialist has notified the CPM of the find and the work stoppage;
b) the specialist, 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.

The designated cultural resources specialist, the project owner, and the CPM shall confer within five working days of the notification of the CPM to determine what, if any, data recovery or other mitigation is needed.

If data recovery or other mitigation measures are required, the designated cultural resource specialist and team members shall monitor earth disturbing and construction activities and implement data recovery and mitigation measures, as needed.

All required data recovery and mitigation shall be completed expeditiously unless all parties agree to additional time.

Verification: Thirty (30) days prior to the start of construction-related vegetation clearance, or earth disturbing activities or project site preparation or the movement or parking of heavy equipment onto or over the project surface, the project owner shall provide the CPM with a letter confirming that the designated cultural resources specialist, alternate cultural resource specialist and delegated monitor(s) have the authority to halt earth disturbing or construction activities in the vicinity of a cultural resource find.

For any cultural resource encountered that the specialist determines is or may be significant, the project owner shall notify the CPM within 24 hours unless there is an intervening weekend. If there is an intervening weekend, the project owner shall notify the CPM on the Monday following the weekend.

For any cultural resource encountered that the specialist determines is not significant, the project owner shall notify the CPM within 72 hours.

CUL-7 Prior to the start of any construction-related vegetation clearance, or earth disturbing activities or project site preparation or the movement or parking of heavy equipment onto or over the project surface, and each week throughout the project construction period, the project owner shall provide the designated cultural resource specialist and the CPM with a current schedule of anticipated project activity in the following month. The schedule shall include a map indicating the area(s) where ground disturbing or construction activities will occur or where other specialists may be conducting mitigation measures. The designated cultural resources specialist shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s).

Verification: At least 10 days prior to the start of project construction-related vegetation clearance, earth disturbing activities or project site preparation or the movement or parking of heavy equipment onto or over the project surface, and in each Monthly Compliance Report thereafter, the project owner shall provide the CPM with a copy of the weekly schedule of the construction activities. The project owner shall notify the CPM when all ground disturbing activities, including landscaping, are completed.

CUL-8 Throughout the pre-construction reconnaissance surveys and the monitoring and mitigation phases of the project, the designated cultural resources specialist and/or alternate cultural resource specialist and delegated monitor(s) shall keep a daily log of any resource finds, and the progress or status of the resource monitoring, collections, mitigation, preparation, identification, and analytical work being conducted for the project. The daily logs shall indicate by tenths of a post mile, where and when monitoring has taken place, where monitoring has been deemed unnecessary, and where cultural resources were found.

The designated specialist shall prepare a weekly summary of the daily logs on the progress or status of cultural resource-related activities.

The designated resource specialist and delegated monitor(s) may informally discuss the cultural resource monitoring and mitigation activities with Commission technical staff.

Verification: Throughout any construction-related vegetation clearance, or earth disturbing activity or project site preparation or the movement or parking of heavy equipment onto or over the project surface, and the project construction period, the project owner shall ensure that the daily logs prepared by the designated cultural resource specialist and delegated monitor(s) are available for periodic audit by the CPM.

CUL-9 Except in the areas specified in Cul-3(f), the designated cultural resource specialist or designated monitor(s), shall be present at all times the specialist deems appropriate to monitor construction-related grading, excavation, trenching, augering, or other disturbance of existing surface in the vicinity of previously recorded archaeological sites and in areas where cultural resources have been identified or are potentially present.

Protocol: If the designated cultural resource specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, except in the areas specified in Cul-3(f), the designated specialist shall notify the project owner of the changes. The designated cultural resource specialist shall use post-mile markers and boundary stakes placed by the project owner to identify areas where monitoring is being reduced or is no longer deemed necessary.

Verification: Throughout the project pre-construction and construction period the project owner shall include in the Monthly Compliance Reports to the CPM copies of the weekly summary reports prepared by the designated cultural resource specialist regarding project-related cultural resource monitoring.

CUL-10 If the project owner obtains a section 404 permit from the U.S. Army Corps of Engineers (USACE), the project owner shall ensure that the designated cultural resource specialist obtains an archaeological resource use permit which may be required by the U.S. Army Corps of Engineers. If cultural resources should be encountered in an area covered by such permit, the project owner and cultural resource specialist will consult with the USACE regarding compliance with Section 106 of the National Historic Preservation Act.

Verification: A copy of the archaeological resource permit obtained by the cultural resource specialist shall be provided to the CPM in the next Monthly Compliance Report following its receipt or renewal. If cultural resource mitigation and/or data recovery are necessary under the archaeological resource use permit, copies of any reports required under the permit shall be submitted to the CPM in the next Monthly Compliance Report following completion of the mitigation reports.

CUL-11 The project owner shall ensure that the designated cultural resource specialist performs the supervision, recovery, preparation for analysis, analysis, preparation for curation, and delivery for curation of all cultural materials encountered and collected during surveys, monitoring, testing, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files, copies of signed contracts or agreements with the museum, university, or other appropriate research specialists responsible for cultural resource services. The project owner shall maintain these files for the life of the project, and the files shall be available for periodic audit by the CPM. The specific locations of sensitive cultural resource sites shall be kept confidential and accessible only to qualified cultural resource specialists.

CUL-12 Following the completion of data recovery and all mitigation work, the project owner shall ensure that the designated cultural resource specialist prepares a proposed scope of work for the Cultural Resources Report. The project owner shall submit the proposed scope of work to the CPM for review and written approval.

Protocol: The proposed scope of work shall include (but not be limited to):

a) discussion of any analysis to be conducted on recovered cultural resource materials;
b) discussion of possible results and interpretation;
c) research questions which may be answered or raised by analysis of the recovered data; and
d) estimate of the time needed to complete the analysis of the recovered cultural materials and to prepare the Cultural Resources Report.

Verification: The project owner shall ensure that the designated cultural resources specialist completes the proposed scope of work within ninety (90) days following completion of the data recovery and site mitigation work. Within seven (7) days after completion of the proposed scope of work, the project owner shall submit it to the CPM for review and written approval.

CUL-13 The project owner shall ensure that the designated cultural resources specialist prepares a Cultural Resources Report. The project owner shall submit the report to the CPM for review and written approval.

Protocol: The Cultural Resources Report shall include (but not be limited to) the following:

a) For all projects:

1. a description of pre-project literature search, surveys, and any testing activities;
2. maps showing areas surveyed or tested;
3. description of any monitoring activities;

4. maps depicting areas monitored and site locations on 7.5 minute USGS topographic base; and
5. conclusions and recommendations.

b) For projects in which cultural resources were encountered, include the items above and also provide:

1. records and maps for sites and isolates;
2. description of any testing and determinations of significance; and potential eligibility
3. discussion of research questions raised or addressed by data from the project.

c) For projects for which cultural resource data were recovered, include a. and b. above, plus the following:

1. description of the methods used in the field and laboratory;
2. verbal description and graphic illustration of recovered cultural materials;
3. results and findings of any special analyses conducted on recovered cultural materials;
4. catalogue of recovered cultural materials; interpretation of the site(s) with regard to the research design; and
5. the name and location of the qualified public repository receiving the recovered cultural resources for curation.

Verification: The project owner shall ensure that the designated cultural resource specialist completes the Cultural Resources Report within ninety (90) days following completion of the collections analysis. Within seven (7) days after completion of the report, the project owner shall submit the Cultural Resources Report to the CPM for review and written approval.

CUL-14 The project owner shall submit an original copy, an original-quality copy, and a computer disc copy (or other electronic format required by the repository) of the CPM-approved Cultural Resource Report to the public repository to receive the recovered data and materials for curation, with copies to the State Historic Preservation Officer (SHPO) and to the appropriate regional archaeological information center(s). Any disc files must meet SHPO requirements for format and content.

Protocol: The copies of the Cultural Resource Report to be sent to the curating repository, the SHPO, and the regional information center shall include the following:

a) originals or original-quality copies of all text;
b) originals of any topographic maps showing survey, site, and monitored resource locations;
c) originals or original-quality copies of drawings of significant or diagnostic materials found during survey, monitoring, testing or mitigation, and subject to analysis and evaluation; and

d) photographs of the any cultural resource site(s) and the various cultural resource materials recovered during project monitoring and mitigation and subjected to post-recovery analysis and evaluation. The project owner shall provide the curating repository with a set of negatives for all of the photographs.

Verification: Within thirty (30) days after receiving approval of the Cultural Resources Report, the project owner shall provide to the CPM documentation that the report has been sent to the public repository receiving the recovered data and materials for curation, the SHPO, and the appropriate archaeological information center.

For the life of the project, the project owner shall maintain in its compliance files copies of all documentation related to the filing of the CPM-approved Cultural Resources Report with the public repository receiving the recovered data and materials for curation, the SHPO, and the appropriate CHRIS information center.

CUL-15 Except for those materials subject to PRC 5097.99, following the filing of the CPM-approved Cultural Resource Report with the appropriate entities specified in CUL-14 above, the project owner shall ensure that all cultural resource materials, maps and data collected during survey, testing, and data recovery and mitigation for the project are delivered to a public repository that meets the US Secretary of the Interior standards for the curation of cultural resources. The project owner shall pay any fees for curation required by the repository. Collections and documents will be prepared to satisfy the requirements of the designated repository.

Verification: The project owner shall ensure that all recovered cultural resource materials are delivered for curation within thirty (30) days after providing the CPM-approved Cultural Resource Report to the entities specified in Cul-14.

For the life of the project, the project owner shall maintain in its compliance files, copies of signed contracts or agreements with the public repository to which the project owner has delivered for curation all cultural resource materials collected during cultural resource services for the project, except for materials subject to PRC 5097.99.

CUL-16 Prior to the start of any vegetation clearing or other earth disturbing activity related to site preparation, construction, or site testing, the project owner and designated cultural resources specialist shall consult with the Native American tribal representatives to develop agreement(s) for qualified monitors as specified in the NAHC Guidelines for Monitoring. The monitor(s) shall be considered as member(s) of the cultural resource team and shall be present during pre-construction and construction phases of the project whenever monitoring is conducted.

Verification: At least thirty (30) days prior to initiating any ground clearing or surface disturbing activity, the project owner shall provide the CPM with a copy of all finalized agreements for Native American monitors. If efforts to obtain the services of qualified Native American monitors prove unsuccessful, the project owner shall immediately inform the CPM who will initiate a resolution process.

REFERENCES

Jackson, T., L. Shapiro, and G. Alcock. 1997. Prehistoric Archaeological Extended Inventory Research at Naval Petroleum Reserve No. 1 (Elk Hills) Kern County, California. Pacific Legacy, Inc.

Jackson, T., L. Shapiro, and G. Alcock. 1998. Prehistoric Archaeological Resources Inventory and Evaluation at Naval Petroleum Reserve No. 1 (Elk Hills), Kern County, California. Pacific Legacy, Inc.

National Park Service. 1997. The Secretary of the Interior's Historic Preservation Professional Qualification Standards. Department of the Interior. Federal Register No. 62, 33708-33723, June 20, 1997.

PEF (Pastoria Energy Facility) 1999a. Application for Certification, Volumes I and II, Pastoria Energy Facility Project (AFC-99-). Submitted to the California Energy Commission on November 30, 1999.

PEF (Pastoria Energy Facility) 1999d. Appendix J – Cultural Resources Literature Review/Field Survey/Site Records dated November 1, 1999; (Vol. II of Application of Certification): confidential filing. Submitted to the California Energy Commission on November 30, 1999.

PEF (Pastoria Energy Facility/Ray) 1999a. Application for Confidential Designation RE cultural Resources Site Descriptions. Submitted to the California Energy Commission on December 30, 1999.

PEF (Pastoria Energy Facility/Thompson) 2000a. Recommended Mitigation Measures and Draft Compliance Plans/Outlines. Submitted to the California Energy Commission on March 6, 2000.

PEF (Pastoria Energy Facility/Thompson) 2000d. Confidential Document – Cultural Resources Test Plan. Submitted to the California Energy Commission on March 29, 2000.

PEF (Pastoria Energy Facility/Thompson) 2000e. Cultural Resources Map J1.0-2 Modified to Depict Archaeological Site Locations, Proposed Flood Retention Berms and Proposed Bridge. Submitted to the California Energy Commission on April 3, 2000.

PEF (Pastoria Energy Facility/Thompson) 2000i. Confidential Document – Preliminary Results: Cultural Resources Testing Plan for the Pastoria Energy Facility. Submitted to the California Energy Commission on April 28, 2000.

Wallace, William J. 1978. Southern Valley Yokuts. In California, vol. 8, edited by R. F. Heizer, pp. 448-461. Handbook of North American Indians, William C. Sturtevant, general editor. Smithsonian Institution. Washington, D. C.

SOCIOECONOMICS[1]

Joseph Diamond, Ph.D.

INTRODUCTION

Generally, a California Energy Commission (Energy Commission) staff socioeconomic impact analysis evaluates the project induced changes on community services and/or infrastructure and related community issues such as environmental justice and facility closure. Direct, indirect, induced, and cumulative impacts are also included. This analysis discusses the potential impacts of the construction and operation of the proposed Pastoria Energy Facility (PEF) on local communities, community resources, and public services, pursuant to Title 14, California Code of Regulations, Section 15131. The applicant for the PEF is Pastoria Energy Facility, Limited Liability Corporation, (PEF, LLC).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The following LORS are applicable to the PEF:

FEDERAL

Executive Order 12898, "Federal Actions to address Environmental Justice (EJ) in Minority Populations and Low-Income Populations." The order focuses federal attention on the environment and human health conditions of minority communities and directs agencies to achieve environmental justice as part of this mission. The Executive Order requires the US Environmental Protection Agency (EPA) and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this problem. Agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations. The Energy Commission receives federal funds and is thus subject to this Executive Order.

STATE

California Government Code, section 65955-659973

It places levies against development projects near school districts. The administering agency is Kern County.

California Government Code, section 65996-65997

As amended by SB 50 (Stats. 1998, ch. 407, Sec. 23), states that public agencies may not impose fees, charges or other financial requirements to offset the cost for school facilities.

[1] The cumulative impacts section is a joint product of Dale Edwards and Joseph Diamond.

LOCAL

Kern County General Plan - Public facilities component pertinent to socioeconomics.

(Policy No. 8) In evaluating a development application, Kern County will consider impacts on the local school districts.

(Implementation E) Determine the local cost of facility and infrastructure improvements and expansion which are necessitated by new development of any type and prepare a schedule of charges to be levied on the developer at the time of approval of the Final Map.

SETTING

Pastoria is located in unincorporated southern Kern County. For a full description of the socioeconomic setting, please refer to the 5.10.1.1 **Study Area** section of the PEF's AFC. (PEF 1999a) The study area (affected area), defined by PEF in the socioeconomics section of the AFC and by staff, includes: southern Kern County, Arvin, Bakersfield, California City, Delano, Maricopa, McFarland, Taft, Shafter, Tehachepi, Wasco, and 50 smaller communities (less than 2,000) within 80 miles of the site. These communities are within a two hour one-way commute distance of the power plant site where construction and operations workers may live.

IMPACTS

Staff reviewed the PEF AFC, Vol. I, November 1999, socioeconomic section (PEF 1999a) regarding potential impacts to community services and infrastructure (i.e., employment, housing, schools, utilities, emergency and other services), and environmental justice. Based on staff's authentication of the socioeconomic data provided and referenced from governmental agencies and trade associations and staff's independent analysis, staff agrees with the AFC's socioeconomic analysis conclusions, with the exception of the cumulative impacts on schools.

EMPLOYMENT

The results of population dispersion, as presented by PEF in the AFC, are that 69 percent of the non-local construction workers (approximately 10 workers at peak construction) are expected to live in Bakersfield. This result would be expected because more amenities are available in Bakersfield when compared to the communities closer to the project site. The results also indicate that approximately 13 percent or 2 workers will likely live in Delano, 13 percent or about 2 workers will likely live in Wasco and Arvin; and the remaining household will likely locate in another area of Kern County (including McFarland, Shafter, Maricopa, Taft, and Tehachapi). Staff finds the dispersion analysis to be reasonable and expected.

The Impact Analysis For Planning (IMPLAN) model (an input-output model), used in the AFC by the PEF to estimate employment impacts from the PEF on the affected area,

is widely used and acceptable to staff. The University of California at Berkeley uses the IMPLAN model for regional economic assessment, and it has been used to assess other generating projects in the area. It is a common regional economic tool. In general, most multipliers are estimated by showing the total change divided by the initial change. Employment multipliers refer to the total additional employment stimulated by the new economic activity. IMPLAN is a disaggregated type of model that divides the (regional) economy into sectors and provides a multiplier for each sector (Lewis et al. 1979). The employment multipliers used by La Paloma were also applied to Sunrise, Elk Hills, PEF, and the Antelope Power Project. A multiplier of 3.23 was used for construction (e.g., each new construction job supports approximately 2.2 indirect and induced jobs in the regional economy) and a multiplier of 2.88 was used for operations (approximately 1.88 indirect and induced jobs in the regional economy). (La Paloma 1998) The 2.88 multiplier for operations is based on a large electrical facility, the Midway Sunset power plant, in Kern County (Smith 1999). These multipliers are within an acceptable range of two, often cited by economists.

Project construction (power generation, electric power transmission, and pipelines for fuel gas, water supply, waste water, and completion of an access road) is expected to occur over a 24 month period. The greatest number of peak construction workers for the power plant, estimated to be 365 workers, will be needed in the 13th month of construction (excluding engineering functions). Approximately 350 of these workers are expected to come from the communities in the affected area, and approximately 15 are expected to relocate from communities outside of the two-hour commute radius.

The average number of construction workers will range from 25 in the first month of construction to approximately 50 workers in the 24th month of construction. The average number of non-local workers needed for power plant construction is estimated to be 16. During operation of the project, about 25 workers will be needed to maintain and operate the project. Approximately 13 (52 percent) of these operations workers may be non-local according to the PEF.

The total employment, estimated by PEF, using an IMPLAN multiplier of 3.23 for construction, is the equivalent of 921 jobs (which includes 636 secondary jobs), based on an average of 285 project-related construction jobs. For project operations, an average of 25 jobs with an IMPLAN multiplier of 2.88 for operations results in an equivalent of 72 total jobs (which includes 47 secondary jobs).

HOUSING

Permanent housing is considered to be in short supply if the vacancy rate is less than five percent (Cleary 1989). As of 1998 (see Table 5.10-4 of the Pastoria AFC), approximately 2,932 housing units in Arvin, 81,932 in Bakersfield, 3,601 in California City, 8,201 in Delano, 3,364 in Shafter, 4,042 in Wasco, 2,418 in Taft, 2,076 in McFarland, 455 in Maricopa, 11,802 in Ridgecrest and 2,783 in Tehachpi. There are approximately 123,606 total housing units in these communities which are within a two-hour commute. The vacancy rate for this housing averages approximately six percent. Therefore, approximately 7,249 single-family, multi-family and mobile homes

are available. In addition, there are approximately 5,498 total motel/hotel rooms with the availability being about 30 percent on average or 2,749 rooms (LPGP 1998). The combination of housing and motel/hotel rooms probably available to non-local construction and operations workers for this project is more than sufficient for worker needs.

SCHOOLS

Based on an average of 16 non-local construction workers and 13 non-local plant operating personnel (assuming an average household size of 2.93 (PEF 1999a), 15 school-aged children for plant construction and 12 school-aged children for plant operation are estimated to be added to the affected area schools with 66 percent or 8 students going to Bakersfield. According to Table 5.10-5 in the AFC, six of thirteen affected area high schools are over capacity. Staff agrees with the PEF AFC that impacts on Maricopa, Shafter and Wasco will not be significant since the number of students during construction are small and the schools are not at capacity. The addition of project-related children to schools that are at- or over-capacity may increase costs in terms of supplies, equipment and/or teachers but the impact will be small.

According to Senate Bill 50, which amended section 17620 of the Education Code in 1998, school funding is restricted to property taxes and statutory facility fees collected at the time the building permit is acquired (i.e., not more than $0.31 per square foot of commercial and industrial covered or enclosed space). (Govt. Code, Sec. 65995 (b)(2)) The limit of $0.31 will increase to $0.33 per square foot on July 1, 2000, and will increase every two years thereafter. (SCPP 1999, AFC page 8.8-1) Based on the list of structures, the project will contain approximately 35,000 square feet of covered or enclosed space, generating an impact fee of approximately $11,550. Actual fees will be calculated based on the final engineering design (PEF 2000a).

Education Code section 17620 states that public agencies may not impose fees, charges or other financial requirements to offset the cost for “school facilities.” School facilities are defined as “any school-related consideration relating to a school district’s ability to accommodate enrollment.” Local and state agencies are precluded from imposing (additional) fees or other required payments on development projects for the purpose of mitigating possible enrollment impacts to schools.

The life of the PEF is estimated by PEF, LLC in the AFC to be a minimum of 25 years. Property taxes on the plant have been estimated to be $3.1 million in the first year for use on infrastructure and services such as schools, government, and social programs and services with about $1.9 million (almost 61 percent allocated to education) (PEF 1999a).

UTILITIES, EMERGENCY AND OTHER SERVICES

The Wheeler Ridge-Maricopa Water Storage District will provide the project with its primary water supply. There are abundant electric supply options available for construction.

During construction or operation, the project is not expected to place significant demands on the Kern County Fire and Sheriff's Departments, the Westside District Hospital (City of Taft) or the five hospitals located in Bakersfield for emergency and other services. Aside from first aid training for foreman and supervisors:

(a) An urgent care facility will be contacted for non-emergency physician referral.
(b) An emergency medical technician or other highly trained medical professional will be assigned to provide advanced injury care.
(c) Health insurance will be provided to avoid burdening the state and local entities with uncompensated services.
(d) Two airlift emergency services are available to the County (PEF 1999a and PEF/Thompson 2000f).

PEF, LLC has stated that the Lebec Fire Station was contacted concerning fire protection during the preparation of the AFC. It is expected that the Kern County Fire Department, including the Lebec Fire Station and the Mettler Station which may be moved, has adequate resources to serve the PEF, LLC during construction and operation. Furthermore, the Lebec Fire Station is not part of the western Kern County up-front fire fund, related to other Energy Commission certified or soon to be certified power plants, because it is not located in western Kern County (Scholl 2000a and PEF/Thompson 2000f). The Mettler Station will move to the Tejon Industrial Complex area requiring one additional firefighter be added to each of the three shifts per day at the relocated station. Also needed are three new personnel for the Kern County Fire Department for one year. PEF will share in the mitigation costs (Hann 2000).

FINANCIAL

PEF, LLC estimates (PEF 1999a, AFC pages 5.10-16) that the construction payroll will be $146 million (1998 dollars) for the 20-24 month construction period, and the operation payroll will be $2.5 million (1999) dollars with $6.1 to $7 million for local supplies annually during operations. PEF, LLC estimates that $42 to $43 million worth of materials and equipment will be purchased locally for construction. The project will generate $17 million in taxes (from sales on materials). This spending will generate sales tax revenues for the local jurisdiction, about one percent for the County, and about 6.25 percent for the State, for a total of 7.25 percent.

ENVIRONMENTAL JUSTICE

The EJ screening analysis contained in the PEF AFC (PEF 1999a, AFC pages 5.8-10&11) is consistent with the federal EJ guidelines. According to the federal EJ guidelines, a minority or low-income population exists if the minority or low-income population percentage is (a) greater than fifty percent of the affected area's general population, or (b) 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.

Based on 1990 U.S. Census data for a six-mile radius[2], the area potentially affected by construction and operation of the proposed power plant, the minority/low-income population is less than 50 percent, and there are no substantial pockets of minority or low-income people.

SOCIOECONOMICS Figure 1 and **SOCIOECONOMICS Figure 2** show the census tracts within a six-mile radius of the proposed PEF site, and indicate the percentage of the population of low-income and minority people in those census tracts. Both Figures 1 and 2 indicate that there is no area (census tract) within the six-mile radius where the percentage of low-income or minority people exceeds 50 percent. There are no significant pockets or clusters of minority or low-income population within the six-mile radius of the proposed power plant, with the exception of one area approximately 3.5 miles to the northeast where there are approximately 12 houses in close proximity to each other. Information in **SOCIOECONOMICS Table 1, Demographic Profile for Census Tracts Within Six Miles of the Pastoria Project Site** indicates that the minority population of the affected area is 19 percent.

Based on the conclusions presented by other technical area staff in this staff assessment, that no unmitigated significant impacts will occur with compliance with staff's proposed conditions of certification, staff has determined that no further EJ analysis is necessary for the PEF project.

CUMULATIVE IMPACTS

Cumulative impacts might occur when more than one project has an overlapping construction schedule that creates a demand for workers that can not be met by local labor, resulting in an influx of non-local workers and their dependents. At the time of filing of the PEF AFC in November 1999, five other power plant projects were identified in the vicinity of the PEF project. The PEF AFC included a discussion of cumulative impacts and concluded that there were none of significance. But, based on staff's analysis there are potential significant socioeconomic impacts to education that cannot be mitigated due to current state law.

[2] A six-mile radius is used because it is the same radius used for staff's cumulative air quality and public health analyses, and a six-mile area captures most if not all of the area potentially impacted by the proposed power plant.

SOCIOECONOMICS Table 1
Demographic Profile for Census Tracts Within Six Miles of the Pastoria Project Site

Census Tract	Hispanic Origin	White	Black	American Indian	Asian Pacific Islander	Other Race	Total by Tract
3302	653	5,724	0	172	7	10	6,566
6001	1,421	12,175	234	128	163	8	14,129
0062	1,520	1,861	18	48	66	13	3,526
Totals	**3,594**	**19,760**	**252**	**348**	**236**	**31**	**24,221**
% of Totals	**15%**	**81%**	**1%**	**1%**	**<1%**	**<1%**	
Source: U.S Census. Race and Hispanic Origin population data for 1990							

Several power plant projects in western or southern Kern County have either filed AFCs or are expected to soon. La Paloma filed their AFC on July 15, 1998 and the project was approved on October 6, 1999. The Sunrise Cogeneration and Power Company (SCPC) filed an AFC on December 21, 1998, for a 320 MW cogeneration project to be located near the community of Fellows. Elk Hills Power Plant Project filed an AFC on February 24, 1999, for a 500 MW combined cycle power plant to be located at Elk Hills. An AFC for PEF was filed on November 30, 1999, for 750 MW, and an AFC was filed in December 1999 for the 500 MW Western Midway Sunset Cogeneration Company Project. An AFC is expected to be filed in September 2000 for a 1000 MW project to be located near California City, currently known as the Antelope Valley project.

SOCIOECONOMICS Table 2, Cumulative Construction Workers (Estimated) shows the estimated number of workers by month for the estimated construction schedules for each of the power plant projects identified above. There are approximately four months that five of the six projects will have overlapping construction schedules. During this period, the total number of workers needed for all five projects ranges from approximately 610 to 1,117[3]. For February 2000, the number of unemployed workers in the Kern County labor force was 32,300 out of a total civilian labor force of 275,000, an unemployment rate of 11.7 per cent (State of California – Employment Development Department, preliminary data, 2000).

Staff agrees that PEF will primarily draw on the local labor force for construction and operation. No significant influx of permanent employee or secondary employment households is expected due to the PEF because Kern County has a

[3] The number of workers for the Sunrise project's related facilities, such as the gas supply line and water line, were not available for their AFC analysis.

SOCIOECONOMICS Table 2
Cumulative Construction Workers (Estimated)

	La Paloma	Sunrise*	Elk Hills	Western Midway Sunset	Pastoria	Antelope**	Total
Year 2000							
Jan							
Feb	53						53
Mar	76						76
Apr	46						46
May	222						222
Jun	304		111				415
Jul	403		128				531
Aug	467	64	142				673
Sep	555	75	195				825
Oct	597	96	241				934
Nov	637	142	306				1085
Dec	665	157	333				1155
Year 2001							
Jan	714	197	352				1263
Feb	729	233	347				1309
Mar	699	241	329				1269
Apr	625	255	317		25		1222
May	521	237	310	24	25		1117
Jun	399	213	231	45	55		893
Jul	195	193	158	73	80		699
Aug	141	124	124	101	120		610
Sep		104		148	180		432
Oct		78		196	275		549
Nov				250	280	48	578
Dec				307		45	352
Year 2002							
Jan				359	270	146	775
Feb				386	275	202	863
Mar				400	325	296	1021
Apr				400	330	392	1122
May				377	365	500	1242
June				251	340	614	1205
July				134	295	718	1147
Aug				90	295	772	1157
Sept				78	280	800	1158
Oct				58	240	800	1298
Nov				52	175	754	981
Dec				22	130	502	654
Year 2003							
Jan					60	268	328
Feb					40	180	220
Mar					35	156	191
Apr					50	116	166
May						104	104
Jun						44	44

- * Does not include the gas line and water line workers.
- ** Antelope estimated to be 1000 MW has a construction workforce based on twice the construction workforce of WMSCCP at 500 MW.

large available labor pool. With the addition of each subsequent project into the construction phase, the ability of the available local labor force to meet project construction needs decreases. The cumulative need for workers in particular crafts or specialties will exceed the availability of workers in those crafts in the local area at different times based on the numbers of specialists available and the total number of specialists needed. Each of the currently filed projects has estimated the number of local vs. non-local workers for construction and operation of their projects, and based on the available work force by craft and other project needs, they have estimated worker availability.

La Paloma, the first of the six projects to start construction, estimates that 86 percent of their average worker needs would be supplied by local and 14 percent by non-local workers. For peak construction, the percentages remain relatively unchanged. Sunrise's estimates are basically the same as La Paloma's. The Elk Hills AFC estimates 80 percent local and 20 percent non-local construction workers for average and peak periods. PEF's AFC estimates 92 percent local and eight percent non-local construction workers on average, and about four percent non-local construction workers for the peak period. For peak construction of the Western MSCC Project, approximately 27 percent of the workforce is expected to be non-local. Staff estimates the Antelope Power Project will have 92 percent local and eight percent non-local construction workers on average, and about four percent non-local construction workers for the peak period due to its proximity to Lancaster and Palmdale which have a combined population estimated to be 250,000 (State of California, Department of Finance 1999). These estimates for local verses non-local workers are consistent with the availability of general construction laborers and the availability of workers in specific crafts in Kern County. There is sufficient housing available in Bakersfield and other communities closer to the project sites to meet all non-local worker needs.

Based on an average of approximately 830 workers during the four months of overlapping construction for five projects, and using an IMPLAN construction multiplier of 3.23, approximately 1,907 secondary jobs are expected to result during that period. Staff does not expect a significant number of these jobs to be filled by non-local workers because these jobs are expected to be temporary, coincident with the construction schedule, and salaries associated with indirect and induced jobs generally do not attract new workers to an area. Over a period of approximately 37 months, related to the construction of two or more of these projects at the same time, secondary jobs are expected to range from approximately 370 to 2,919**.** Generally, as construction of La Paloma, Sunrise and Elk Hills projects are completed, construction of Western MSCCP, Pastoria, and Antelope projects will be built moderating the impact of overlapping power plant construction schedules.

Using an IMPLAN operation employment multiplier of 2.88, secondary jobs expected from the operation of the projects range from 111 for two projects to 205 for all six projects (based on estimates of 59 employees for La Paloma and Sunrise projects,

and 109 employees for all six projects). These secondary jobs are estimated to be filled from the local work force.

Based on an estimated average of 222 non-local workers for all six projects during construction, and assuming the average family size to be 2.93 persons (PEF 1999a), approximately 207 children are estimated to be added to Kern County schools. These children will not enter and leave the schools at the same time. The increase in school enrollments due to non-local worker's children related to the construction of the six projects will cause a potential significant socioeconomic impact on those schools in the Bakersfield area that are currently at or over-capacity. However, the increase in school enrollments due to the six projects during operation is not expected to cause an impact because students will attend many schools that are under-capacity and the number is relatively small. Indeed, many non-local construction workers may not bring their children so the estimates could be high. Schools that are expected to handle more students are expanding their overall capability to meet needs and school impacts fees and property taxes will help fund education.

Other future projects included in a discussion of cumulative impacts include:

1. The Tejon Industrial Complex is a five year project which was approved by the Kern County Board of Supervisors in April 2000 (Rickels 2000) and has no significant impacts except for population and housing resulting from inducing substantial growth in either a direct or indirect way (i.e., indirect development for residential and non-residential land (Impact Sciences 2000). A fiscal impact study done for Kern County found that the overall net fiscal effect of project development and occupancy on the General Fund and Fire Fund of the County is identified on a combined basis, buildout of the 290 acres describing the Tejon Industrial Complex represents a recurring net income stream to Kern County of roughly $700,000 per year (Gobar 1999).

2. San Midio New Town Specific Plan includes 9,447 acres of mixed-use development (residential and industrial) and is located west of I-5 and southwest of the Tejon Industrial Complex. This plan may never be implemented because of water entitlements that were lost and a portion of the Plan area is owned by The Nature Conservancy (PEF 1999a).

The Kern County Fire Department (KCFD) provides emergency medical response for the proposed power plants. The KCFD believes that it has adequate resources to provide emergency medical response for the six power plants that have been identified in this cumulative analysis.

The KCFD fire fighting resources are sufficient to cover all six of the proposed power plant projects**.** However, the fire department has identified a need for one new ladder truck to maintain its current level of service and to effectively respond to the types of emergency incidents that occur at facilities such as the proposed power plants. Specifically, the fire department sees an increase in the number of emergency responses that will require High Angle and Confined Space Specialist Technicians

and equipment. The fire department requires one new, properly equipped, ladder truck that will be assigned to Station 21 at Taft, nine new personnel to cover three work shifts per day, and a replacement ladder truck approximately 15 years in the future.

The State Board of Equalization, at an April 21, 1999 Property Tax Committee meeting, formally decided to assess only power generating facilities with a Certificate of Public Convenience and Necessity (CPCN) using unitary valuation and allocation of revenues on a countywide basis. Thus, local collection and distribution of property taxes will apply to the Pastoria project and other power plant projects proposed for Kern County.

The Kern County Sheriff will provide police service for the six new projects, and existing resources are expected to be adequate to meet law enforcement needs during their construction and operation. Westside District Hospital serves the area for five of the six new projects (all except the Antelope project), and it is expected to adequately meet medical service needs during construction and operation of those five new projects along with emergency services from the Kern Fire Department. The medical services available in the area of the Antelope project will be discussed in the staff analysis for that project.

FACILITY CLOSURE

PLANNED CLOSURE

The PEF AFC does not provide for the inclusion of socioeconomic LORS that will be incorporated into the facility closure plan when it becomes necessary at the end of the project's economic life. The socioeconomic impacts of facility closure will be evaluated at that time.

UNEXPECTED TEMPORARY CLOSURE

Any unexpected, temporary closure would not likely cause any significant environmental impacts on the affected area, because the likely result of a temporary closure would be reactivation of the power plant by the same or a new owner within a relative short period of time. Personnel changes may occur if there is an ownership change, but socioeconomic impacts would not change significantly because the number of operating personnel would remain relatively the same.

UNEXPECTED PERMANENT CLOSURE

Any unexpected, permanent closure of PEF would not likely cause any significant socioeconomic impacts on the affected area, because facility closure impacts (i.e., dismantling) would be similar to construction impacts, and staff has found no significant socioeconomic impacts due to the construction of the project.

MITIGATION

The PEF contends that impacts to schools will be mitigated by the property taxes paid in connection with operation of the proposed project. Staff has determined that, even though a potential significant socioeconomic cumulative impact has been identified for Kern County schools during the construction period for five power plant projects in western Kern County, including PEF, with the changes to the Education Code resulting from the passage of SB 50 in 1998, school funding is now restricted to a combination of property tax revenues and a statutory development fee based on a project's covered or enclosed space.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The estimated gross benefits from the project include increases in the affected area's property and sales taxes, employment, and sales of services, manufactured goods and equipment. For example, during average construction there are 285 direct project-related construction jobs and 921 total jobs (285 average construction jobs x 3.23 (IMPLAN construction multiplier)) will be created, of which 636 are secondary (indirect and induced) jobs. For average operations, 25 direct jobs will be created with 47 secondary (indirect and induced) jobs for a total of 72 jobs. The annual property tax to be collected by Kern County for the PEF over the first year of operation, given an estimated minimum of 25 years of expected life, was estimated to be $3.1 million (PEF 1999a, AFC page 5.8-16 and also see Table 10-7, page 5.10-30 for additional information on property taxes and their economic impact in Kern County from the PEF).

Staff finds that the PEF project will not cause a significant adverse impact on the affected area's housing, schools, police, emergency services, hospitals, utilities and employment. Based on staff's demographic screening analysis, the population of low-income or minority people within six miles of the proposed power plant site did not meet the threshold of having a population of minority or low-income people greater than 50 percent, or population pockets sufficient to require a full Environmental Justice analysis. In addition, no project-related unmitigated significant impacts were found in the other technical area analyses included in this Preliminary Staff Assessment.

Although staff identified a potentially significant socioeconomic cumulative impact on schools as a result of the PEF and other new power plant projects in western Kern County, mitigation for the impact on schools is not possible under current state law. A socioeconomic cumulative impact on fire protection and needed mitigation is noted in the Worker Safety and Fire Protection Testimony.

The project, as proposed, is consistent with all applicable socioeconomic LORS. The proposed conditions of certification ensure compliance with LORS.

RECOMMENDATIONS

Staff recommends that should the PEF project be approved, the proposed conditions of certification be adopted by the Commission.

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner shall pay the statutory school impact development fee as required at the time of filing for the "in-lieu" building permit with the Kern County Department of Engineering and Survey Services and Building Inspection.

VERIFICATION: The project owner shall provide proof of payment of the statutory development fee to the Compliance Project Manager (CPM) in the next Monthly Compliance Report following the payment.

REFERENCES

Chaffin, M. 1999. Kern County Fire Marshall. Conversation with staff on March 23, 1999

Impact Sciences. 2000. Tejon Industrial Complex Final Environmental Impact Report Volume II: Appendices, February 2000.

Cleary, Cam. 1989. California Department of Housing and Community Development, Telephone conversation with Gary D. Walker, Commission Staff. November 14.

Gobar Associates, Alfred. 1999. Fiscal Impact Analysis-Tejon Industrial Complex, December 1999.

Hann, Kathleen. 2000. CEC consultant. Testimony regarding Worker Safety And Fire Protection, June 27, 2000.

Lewis, Eugene, Russell Youmans, George Goldman, Garnet Premer. 1979. Economic Multipliers: Can a rural community use them? Western Rural Development Center 24.

LPGP (La Paloma Generating Project). 1998. Application for Certification, La Paloma Generating Project (98-AFC-2). Submitted to the California Energy Commission, August 12.

PEF (Pastoria Energy Facility) 1999a. Application for Certification, Volumes I and II, Pastoria Energy Facility Project, (99-AFC-7). Submitted to the California Energy Commission, November 30, 1999.

PEF (Pastoria Energy Facility) 2000a. Response To CEC Data Advisory Comments; dated December 29, 1999 (Supplement to AFC-99-7). Submitted to the California Energy Commission on January 5, 2000.

PEF (Pastoria Energy Facility/Scholl) 2000a. Response To Data Requests 2000 (First Data Response submittal). Submitted to the California Energy Commission, March 13, 2000.

PEF (Pastoria Energy Facility/Thompson) 2000 f, Applicant's Data Request Responses (Third Data Response Submittal). Submitted to the California Energy Commission on April 3, 2000.

Rickels, Dave. 2000. Planner with Kern County Planning Department. Conversation with Staff on May 8, 2000.

SCPP (Sunrise Cogeneration and Power Project) 1999. Application for Certification, Sunrise Cogeneration and Power Project (98-AFC-4). Submitted to the California Energy Commission, revised January 27, 1999.

Smith, Charles. 1999. Consultant with Woodward-Clyde. Conversation with staff on January 5, 1999.

State of California, Department of Finance. 1999. City/County Population estimates With Annual Percent Change.

State of California, Employment Development Department, Monthly Labor Force Data for Counties, October 1999 (Preliminary).

US Census 1990. "California: Preliminary Counts for Cities, Counties, and State"; April 1, 1990.

BIOLOGICAL RESOURCES

Rick York

INTRODUCTION

This section provides the Energy Commission staff's analysis of potential impacts to biological resources from the construction and operation of the Pastoria Energy Facility (PEF). This analysis addresses potential impacts to state and federally listed species, species of special concern, wetlands, and other areas of critical biological concern. This analysis also describes the biological resources of the project site and at the locations of appurtenant facilities. It also 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 PEF Application for Certification (AFC) (PEF 1999a), workshops, staff data requests and applicant responses (Scholl 2000a) site visits, project description clarifications (PEF/Parquet 2000a) and discussions with various agency representatives.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The applicant and PEF will need to abide by the following laws, ordinances, regulations, and standards during project construction and operation.

FEDERAL

CLEAN WATER ACT OF 1977

Title 33, United States Code, sections 1251 – 1376, and Code of Federal Regulations, part 30, section 330.5(a)(26).

ENDANGERED SPECIES ACT OF 1973

Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.

MIGRATORY BIRD TREATY ACT

Title 16, United States Code, sections 703 - 712, prohibits the take of migratory birds.

STATE

CALIFORNIA ENDANGERED SPECIES ACT OF 1984

Fish and Game Code sections 2050 et seq. protects California's rare, threatened, and endangered species.

NEST OR EGGS – TAKE, POSSESS, OR DESTROY

Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs or any bird.

BIRDS OF PREY OR EGGS – TAKE, POSSESS, OR DESTROY

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

MIGRATORY BIRDS – TAKE OR POSSESSION

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

FULLY PROTECTED SPECIES

Fish and Game Code sections 3511, 4700, 5050, and 5515 prohibits take of animals that are classified as Fully Protected in California.

SIGNIFICANT NATURAL AREAS

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

STREAMBED ALTERATION AGREEMENT

Fish and Game Code section 1600 et seq. requires CDFG to review project impacts to waterways, including impacts to vegetation and wildlife from sediment, diversions and other disturbances.

NATIVE PLANT PROTECTION ACT OF 1977

Fish and Game Code section 1900 et seq. designates state rare, threatened, and endangered plants.

CALIFORNIA CODE OF REGULATIONS

Title 14, sections 670.2 and 670.5 list animals of California designated as threatened or endangered.

REGIONAL WATER QUALITY BOARD

To verify that the federal Clean Water Act permitted actions comply with state regulations, PEF will need to get a Section 401 certification from the San Joaquin

Valley Regional Water Quality Control Board. The Regional Board provides its certification after reviewing the federal Nationwide Permit(s) that is provided by the U. S. Army Corp of Engineers.

LOCAL

KERN COUNTY GENERAL PLAN LAND USE, OPEN SPACE, AND CONSERVATION ELEMENTS OF 1994

SECTION 8, RESOURCES

Policy 14: Habitats of threatened and endangered species should be protected to the greatest extent possible.

KERN COUNTY GENERAL PLAN ENERGY ELEMENT OF 1990

PART 1 - ISSUES, GOALS, POLICIES, AND IMPLEMENTATION

Policy 12 - The County should work closely with local, state, and federal agencies to assure that all projects, both discretionary and ministerial, avoid or minimize direct impacts to fish, wildlife and botanical resources, whenever practical.

Policy 13 - The County should develop and implement measures that result in long-term compensation for wildlife habitat that is unavoidably damaged by energy exploration and development activities.

SETTING

The proposed project is to be located on approximately 32-acres of Tejon Ranch land in southern Kern County, California. The proposed PEF site is located in the southern end of the San Joaquin Valley, immediately adjacent to Pastoria Creek that flows from the Tehachapi Mountains. The Tehachapi Mountains are located south and east of Bakersfield.

The project region has historically been used for cattle grazing, ranching, and oil development. The natural habitat types found in the project area are non-native grassland, freshwater marsh, and riparian scrub (PEF 1999a). The dominant habitat type is non-native grassland. In addition, various agricultural lands are found in the project region and a gravel mine is located immediately adjacent (southeast) to the proposed project site. Pastoria Creek is located less than 1 mile west of the proposed power plant site.

The non-native grasslands are dominated by wild oat (*Avena* sp.), brome (*Bromus* spp.), and foxtail (*Hordeum* spp.). Scattered throughout the project region in the non-native grasslands are native grassland species such as perennial bunchgrasses (*Nassella cernua* and *Aristida purpurea*). These native bunchgrass grassland species were most likely the dominant species prior to cattle grazing (PEF 1999a).

Native annual and perennial herbs are common among the grasslands, especially blue dicks (*Dichelostemma pulchellum*), owl's clover (*Castilleja exerta*), farewell-to-spring (*Clarkia* spp.), and lupine (*Lupinus* spp.). Non-native herbs commonly found in the project region are filaree (*Erodium* sp.), clover (*Trifolium* sp. and *Medicago* sp.) and yellow star-thistle (*Centauria solstitialis*).

A variety of sensitive species are found in the project region. Sensitive species known to occur in the project region include the San Joaquin kit fox (*Vulpes macrotis mutica*), San Joaquin antelope squirrel (*Ammospermophilus nelsoni*), blunt-nosed leopard lizard (*Gambelia sila*), California condor (*Gymnogyps californianus*), and an undescribed Mariposa lily (*Calochortus* sp.).

For a complete list of the sensitive species the applicant considered for this proposed project, see Biological Resources Table 1, on the next page.

BIOLOGICAL RESOURCES - Table 1
Sensitive Species
(PEF 1999a)

Sensitive Plants	Status*
Bakersfield cactus (*Opuntia basilaris* var. *treleasei*)	FE/CE/CNPS List 1B
Piute Mtns. navarretia (*Navarretia setiloba*)	FPT/CNPS List 1B
Undescribed Mariposa lily (*Calochortus* sp.)	None
Kern buckwheat (*Eriogonum kennedyi* var. *pinicola*)	FSC/CNPS List 1B
Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)	FSC/CNPS List 1B
Comanche Point layia (*Layia leucophylla*)	FSC/CNPS List 1B
Flax-like monardella (*Monardella linoides* ssp. *oblonga*)	FSC/CNPS List 1B

Sensitive Wildlife	Status*
San Joaquin antelope squirrel (*Ammospermophilus nelsoni*)	CT
Giant kangaroo rat (*Dipodomys ingens*)	FE/CE
San Joaquin pocket mouse (*Perognathus inornatus neglectus*)	FSC
Tehachapi pocket mouse (*Perognathus alticolus inexpectatus*)	FSC/CSC
American badger (*Taxidea taxus*)	CSC
San Joaquin myotis (*Myotis yumanensis oxalis*)	FSC/CSC
Townsend's big-eared bat (*Corynorhinus townsendii townsendii*)	None
Western mastiff bat (*Eumops perotis*)	FSC/CSC
San Joaquin kit fox *(Vulpes macrotis mutica*)	FE/CT
California condor (Gymnogyps californianus)	FE/CE
Cooper's hawk (*Accipiter cooperi*)	CSC
Sharp-shinned hawk (*Accipiter striatus*)	CSC
Golden eagle (*Aquila chrysaetos*)	CSC
Ferruginous hawk (*Buteo regalis*)	FSC/CSC
Swainson's hawk (*Buteo swainsonii*)	FSC/CT
Northern harrier (*Circus cyaneus*)	CSC
Burrowing owl (*Athene cunicularia*)	CSC
Merlin (*Falco columbarius*)	CSC
Prairie falcon (*Falco mexicanus*)	CSC
Peregrine falcon (*Falco peregrinus anatum*)	CE
Long-eared owl (*Asio otis*)	CSC
California horned lark (*Eremophila alpestris actia*)	CSC
Purple martin (*Progne subis*)	CSC
Loggerhead shrike (*Lanius ludovicianus*)	FSC/CSC
Tricolored blackbird (*Agelaius tricolor*)	FSC/CSC
Tehachapi slender salamander (*Batrachoseps stebbinsi*)	FSC/CT
Yellow-blotched salamander (*Ensatina eschscholtzii croceator*)	CSC
Western spadefoot toad (*Scaphiopus hammondii*)	FSC/CSC
California red-legged frog (*Rana aurora draytonii*)	FT/CSC
Blunt-nosed leopard lizard (*Gambelia sila*)	FE/CE/CFP
Southern rubber boa (*Charina bottae umbratica*)	FSC/CT
San Joaquin coachwhip (*Masticophis flagellum ruddocki*)	FSC/CSC
Southwestern pond turtle (*Clemmys marmorata pallida*)	FSC/CSC
San Diego horned lizard (*Phrynosoma coronatum blainvillei*)	FSC/CSC
California legless lizard (*Anniella pulchra pulchra*)	FSC/CSC
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	FT

* STATUS – FE = Federally listed Endangered; FT = Federally listed Threatened; FSC = Federal Species of Special Concern; FPT = Federal proposed Threatened; CNPS List 1B = California Native Plant Society Inventory of Rare and Endangered Plants, Rare and Endangered Plants of California and elsewhere (California Native Plant Society 1994); CE = California listed Endangered, CT = California listed Threatened; CSC = California Species of Special Concern; and CFP = California Fully Protected.

For a complete list of all the species of plants and wildlife that were recorded during the biological resources assessment, refer to Appendix B of the Biology Technical Report (AFC Appendix N, PEF 1999a).

POWER PLANT SITE AND ANCILLARY FACILITIES HABITAT DESCRIPTIONS

The proposed project site is located in the southern end of the San Joaquin Valley in southern Kern County, California. This region of California is habitat for sensitive species such as, but not restricted to, the San Joaquin kit fox, San Joaquin antelope squirrel, Swainson's hawk, California condor, burrowing owl, and loggerhead shrike. Acreage impact amounts are based upon information provided by Anne Knowlton of URS Greiner Woodward Clyde (Knowlton 2000).

POWER PLANT SITE AND CONSTRUCTION LAYDOWN AREA

The power plant will be located on Tejon Ranch property in a region of the ranch that has a history of cattle grazing, agricultural production, and gravel mining. Construction of the power plant will result in the permanent loss of 32-acres of non-native grassland habitat. Use of the construction laydown area will result in temporary disturbance of 25-acres of non-native grassland habitat.

POWER PLANT ACCESS ROAD

The power plant access road will be located primarily in non-native grassland habitat. The road will need to cross Pastoria Creek, and impact freshwater marsh habitat. Construction of the access road will result in temporary disturbance to 8-acres of non-native grassland habitat, and permanent loss of 4.0-acres of non-native grassland habitat. In addition to permanent loss of grassland habitat, crossing Pastoria Creek will result in the temporary disturbance of 0.03-acres of riparian scrub habitat.

TRANSMISSION LINE

Primarily non-native grassland habitat will be traversed during construction of the new 1.38-mile transmission line to connect to the existing Pastoria Substation. The new transmission line will cross Pastoria Creek at one location, however the creek will not be impacted since the new transmission line will span the creek. Construction of the new transmission line will result in the temporary loss of approximately 23-acres of non-native grassland and ruderal habitat and the permanent loss of 0.1-acre non-native grassland habitat.

WATER SUPPLY PIPELINE

The approximately 0.2-mile water supply pipeline will traverse primarily non-native grassland habitat as it travels north to its interconnection point with an existing water pipeline. Construction of the water supply pipeline will result in the temporary disturbance of approximately 0.6-acres of non-native grassland habitat.

FUEL GAS SUPPLY PIPELINE

The 11.65-mile fuel gas supply pipeline will connect the proposed project to the existing Kern River-Mojave Gas Pipeline. A total of 71-acres would be temporarily

impacted during pipeline construction. Of this total, approximately 48-acres of non-native grassland habitat, 0.1-acres of freshwater marsh habitat, and approximately 23-acres of agricultural lands will be disturbed along road right-of-ways during pipeline construction. Several ephemeral drainages containing freshwater marsh habitat occur along the proposed route and will be disturbed during pipeline construction.

IMPACTS

PROJECT SPECIFIC DIRECT IMPACTS

In the California Environmental Quality Act Guidelines, direct impacts are defined as those impacts that are directly attributable to 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 proposed project may directly impact a variety of sensitive species known to occur in the project vicinity. To address any concerns about these potential impacts, the applicant has proposed a variety of mitigation measures they intend to employ to minimize or totally avoid impacting individual sensitive species (PEF/Thompson 2000a). The final list of mitigation measures and implementation methods will be completed in consultation with the CDFG, BLM, and the USFWS, and will be included in the project's Biological Resources Mitigation Implementation and Monitoring Plan. For more information about specific mitigation measures and the project's Biological Resources Mitigation Implementation and Monitoring Plan, refer to Biological Resources Conditions of Certification **BIO-9**.

This project may also contribute to the fragmentation of wildlife habitat in the project area. To address this issue, the applicant has indicated that they will minimize impacts to habitat and protect sensitive areas, including natural drainages and riparian corridors, to meet all state and federal regulatory requirements. The applicant also intends to implement habitat restoration measures to lessen the project's temporary impacts to wildlife habitat.

It is staff's opinion that although San Joaquin kit fox were not seen during field surveys for the proposed project facilities that the area is San Joaquin kit fox habitat. The San Joaquin kit fox is currently found north of the project site near Comanche Point, and will continue to be there after this project is constructed and operating. Thus, staff has recommended that a variety of mitigation measures be implemented to minimize or totally avoid impacts to the San Joaquin kit fox and other sensitive species found in the region.

Loss of sensitive species habitat is the primary concern of staff since conversion of habitat by agriculture and industrial and urban development have eliminated these species from the majority of their historic range (USFWS 1998). Information provided by the applicant (Knowlton 2000 and PEF/Parquet 2000a) helped quantify the project's direct, temporary and permanent, habitat acreage impacts. The

following table (Biological Resources Table 2) identifies the PEF direct acreage impacts to wildlife habitat.

BIOLOGICAL RESOURCES - Table 2
DIRECT IMPACTS ACREAGES
(Knowlton 2000)

Project facility	Permanent[1] Impacts Acreage	Temporary Impacts Acreage
Power plant	32.0	--
Construction laydown area	--	25.0
Transmission line	0.1	23.0
Access road	4.0	8.0
Water supply pipelines	--	0.6
Fuel gas pipeline	--	71.0
IMPACT ACREAGE TOTALS	**36.1-acres**	**127.6-acres**

INDIRECT IMPACTS

In addition to the direct impacts that will occur as a result of the project, indirect impacts may also occur. The USFWS has indicated (USFWS 2000) that the additional growth that may occur as a result of this and other new power plant projects may indirectly affect federally listed species addressed by the federal Endangered Species Act. This issue has recently been addressed by the Energy Commission (Therkelsen 2000). The Energy Commission indicated that it does not support the USFWS argument that these new power plants are growth inducing, and that indirect impacts to listed species will result from their construction and operation. However, Energy Commission staff and the USFWS are continuing to discuss this issue.

IMPACTS TO SAN JOAQUIN KIT FOX MOVEMENT CORRIDOR

Wildlife corridors link together areas of suitable habitat that are often separated by topography, changes in vegetation, or by human disturbance. The fragmentation of wildlife habitat by development creates isolated “islands” or wildlife habitat. Wildlife corridors mitigate the effects of this fragmentation by allowing animals to move between remaining habitat, which allows small populations to be increased in size and promotes genetic exchange. Wildlife corridors also provide escape routes, thus reducing the risk of catastrophic events (such as fire or disease) and provide paths for individual animals to roam about their range in search of food, water, mates, and other basic needs.

The San Joaquin kit fox is a wide-ranging mammal species, but its overall range has been greatly reduced because of habitat loss associated with agricultural conversion and industrial and urban development. The San Joaquin kit fox has been listed as an endangered species for more than 30-years. Its historic range included most of the San Joaquin Valley, however its range had been reduced by

[1] These permanent and temporary impacts acreage amounts do not agree with acreage amounts provided in the applicant’s Draft Erosion Control and Stormwater Management Plan (PEF/Thompson 2000a) and acreage impacts provided by Anne Knowlton (Knowlton 2000). Clarification of acreage impacts will be needed prior to the Final Staff Assessment.

more than one-half by 1930 (USFWS 1998). The current range now includes portions of the San Joaquin Valley floor and surrounding foothills of the coast ranges, Sierra Nevada Mountains, and Tehachapi Mountains.

The Recovery Plan for Upland Species of the San Joaquin Valley (USFWS 1998) has developed habitat protection and population interchange strategies to address concerns about the recovery of the San Joaquin kit fox. One of strategies identified is to "protect existing kit fox habitat in the northern, northeastern, and northwestern segments of the kit fox range and existing connections between habitat in those areas and habitat *further south* (emphasis added)." The proposed PEF project is located in the southern end of the San Joaquin Valley and within the area identified in the Recovery Plan as needing protection. Protection of habitat in this area will allow for the connection of various kit fox populations so remaining populations are not further isolated.

Even though a recent, comprehensive survey of the San Joaquin kit fox has not been completed, local surveys, research projects, and incidental sightings indicate that kit foxes currently inhabit some areas of suitable habitat on the San Joaquin Valley floor and in the surrounding foothills of the coast range, Sierra Nevada, and Tehachapi Mountains. The USFWS has historic records of San Joaquin kit fox occurring in the region of the proposed project (Cross 2000).

The San Joaquin kit fox corridor issue, and impacts to the corridor, has been identified by staff (CEC/Lewis 2000a) and the USFWS as an important issue needing resolution. This issue has been discussed by the applicant, the USFWS, representatives of Tejon Ranch, and Energy Commission staff on several occasions. During a conference call on June 5, 2000, the USFWS indicated a willingness to consider the establishment of an open space easement for at least 32-acres within an area adjacent to the PEF site. This open space easement strategy would be a way to preserve habitat in the kit fox corridor area.

The open space easement would need to be part of the lease agreement between the PEF project owner and the landowner, Tejon Ranch. No time frame has been suggested for how long the open space easement would need to be in place. However, the USFWS expressed a willingness to consider a short-term open space easement since the PEF facility may be removed after the project has been permanently closed and the habitat restored. If the habitat were restored, then a portion of the kit fox corridor would also be restored.

The USFWS has also indicated that they may agree to the open space strategy if Tejon Ranch will agree that the kit fox corridor issue, including the proposed PEF site, is adequately addressed in an HCP currently under development by Tejon Ranch. This HCP, the Tejon HCP, which will address several thousand acres, including the PEF site, may be completed within 5 years.

If this strategy is acceptable to Tejon Ranch, then the open space easement terms and conditions must address how the open space will be maintained to allow for kit fox movement within the wildlife corridor area.

CUMULATIVE IMPACTS

The California Environmental Quality Act defines cumulative impacts as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” Cumulative impacts can occur when individually minor but collectively significant projects taking place over time.

The PEF project will, if built, be located in an area of southern Kern County that has not experienced development, however staff expects that development will occur over time. There is the potential for at least three additional power plants (La Paloma, Western Midway-Sunset, and Elk Hills), in addition to the PEF project, to be built in the region in the near future.

All of this energy-related development in the region has the potential to impact sensitive species and their habitats. As an example, vehicles may hit individual sensitive species. In addition, permanent habitat losses will occur as projects are constructed.

Because there are so many sensitive species in the region, the USFWS requires regional strategies to minimize impacts to sensitive species and their habitat. In addition, PEF will be required to abide by the conditions of certification established by Energy Commission staff to avoid impacts whenever possible, and to minimize impacts when impacts are unavoidable.

Cumulative habitat loss in Kern County is an ongoing regional concern of the California Department of Fish and Game (CDFG), the USFWS, and the Energy Commission. To address this issue, CDFG and the USFWS require habitat compensation when habitat losses are anticipated for all development projects, including energy projects.

For the PEF project, the applicant has indicated (PEF 1999a) that they intend to provide suitable habitat compensation funds to mitigate the PEF habitat impacts. The applicant has also indicated that they intend to implement take avoidance measures to minimize impacts to individual species. Habitat compensation will involve the purchase of an agreed-to amount of compensation habitat and the establishment of a suitable endowment to guarantee perpetual protection of the compensation habitat.

The details regarding the amount and the location of the habitat compensation is not completely identified as of this staff assessment. However, staff and the applicant have discussed this issue on several occasions. During these discussions, the applicant has expressed a willingness to provide their habitat compensation to the Center for Natural Lands Management (CNLM). CNLM manages several preserves in Kern County, including the Lokern Preserve, located approximately 45 miles northwest of the proposed project site. The Lokern Preserve currently encompasses more than 3500 acres, and is located within a much larger planning area identified as the Lokern Natural Area. The 44,000-acre Lokern Natural Area has been identified by CDFG, USFWS, the Energy

Commission and other state, federal, and county agencies as an area needing protection since it is relatively undisturbed and contains sensitive species populations.

In addition to PEF, other energy projects (La Paloma, Sunrise, and Elk Hills) have also agreed to provide their habitat compensation funds to CNLM to purchase habitat as part of the Lokern Preserve. In addition, the Western Midway Sunset project has expressed a willingness to consider providing its habitat compensation to CNLM for habitat purchases to be added to the Lokern Preserve.

By expressing a willingness to provide its habitat compensation to CNLM and institute sensitive species take avoidance measures, the applicant will not only be addressing its direct habitat compensation responsibilities, but also lessening staff's concern that the project will contribute to any cumulative species or habitat losses. The PEF habitat compensation will occur within the region that is to be impacted, and the compensation will be provided to an existing regional preserve to address the regional habitat loss problem associated with continuing energy development. In addition, far more habitat will be protected than is being impacted, and the protected habitat will be of much higher quality and value for the region's sensitive species than that which is being impacted.

For these reasons, staff does not believe that the project will create any incremental effects that are cumulatively considerable, and the combined impacts associated with PEF's incremental effect and the effects of other related projects is therefore not considered significant.

FACILITY CLOSURE

Sometime in the future, the PEF will either experience 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" will be developed by the project owner, and approved by the Energy Commission Compliance Project Manager (See **General Conditions** section in **Facility Closure** and Biological Resources Condition of Certification **BIO-12**). Facility Closure mitigation measures will also be included in the Biological Resources Mitigation Implementation and Monitoring Plan (See Biological Resources Condition of Certification **BIO-9**).

PLANNED OR UNEXPECTED PERMANENT FACILITY CLOSURE

The region surrounding the proposed project site is a mosaic of disturbed and undisturbed valley saltbush scrub and non-native grassland habitats. The undisturbed and disturbed habitats are dominated by native and non-native plant species that provide food and cover for the associated species, including several protected plant and wildlife species. Since the proposed project area currently provides habitat for these species, the facility closure plan needs to address habitat restoration measures to be implemented in the case of a planned or an unexpected permanent closure. Habitat restoration measures that should be addressed include

such tasks as the removal of all power plant site structures and the immediate implementation of habitat restoration measures to re-establish native plant species and native habitat types (e.g., valley saltbush scrub). In addition, planned or unexpected permanent facility closure may also trigger the removal of the transmission conductors, and possibly the entire transmission line, since birds are known to collide with transmission conductors.

UNEXPECTED TEMPORARY CLOSURE

Staff does not have any biological resource facility closure recommendations if an unexpected temporary closure of the PEF power plant. However, in the event that the Energy Commission CPM decides that the facility is permanently closed, the above-mentioned facility closure measures need to be given careful consideration.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

The applicant has developed a mitigation strategy that maximizes the avoidance of impacts to sensitive species and their habitat (PEF/Thompson 2000a). Where avoidance is not possible, the applicant has proposed to implement a habitat compensation strategy for both temporary and permanent, direct impacts associated with the project. In addition, the applicant has provided mitigation strategies for project design and siting, pre-construction, construction, post-construction, operation and maintenance activities.

IMPACT AVOIDANCE MEASURES

The applicant has suggested that the following wildlife impacts avoidance measures be implemented:

- Site transmission line poles, access roads, pulling sites, and storage and parking areas to avoid sensitive species whenever possible.
- Avoid all wetlands, where appropriate, and minimize disturbance to "waters" and wetlands during construction of the linear components.
- Design and construct transmission lines and poles to reduce the likelihood of electrocutions of large birds.
- Bury any pipelines that cross streams and dry creek beds below the scour depth. Streambeds disturbed during construction will be recontoured so that drainage patterns are not changed from pre-construction conditions.
- Hire a biologist, who is acceptable to the Energy Commission and the USFWS, to conduct pre-construction surveys no more than 14 days prior to initiation of construction in any portion of the project area.
- Clearly mark construction area boundaries with stakes, flagging, and/or rope or cord to minimize inadvertent degradation or loss of adjacent habitat during facility construction.
- Store equipment in designated construction zones or areas that are not currently considered sensitive species habitat.

- Post signs and/or fence the power plant site and laydown area to restrict vehicle access to designated areas.
- Institute traffic restraints and signs to minimize temporary disturbance. A 20-mph speed limit will be implemented on the project site.
- Hood night lighting during pipeline construction to avoid attracting nocturnal wildlife species.
- Provide wildlife escape ramps for construction areas that contain steep-walled holes or trenches.
- Inspect trenches each morning for entrapped animals prior to the beginning of construction. Construction will be allowed to begin only after trapped animals are able to escape voluntarily.
- Inspect all construction pipes, culverts, or similar structures with a diameter of 4-inches or greater for kit foxes prior to pipe burial. Pipes to be left in trenches overnight will be capped.
- Make certain that all food-related trash is disposed of in closed containers and removed at least once a week. Feeding of wildlife shall be prohibited.
- Prohibit firearms except for those carried by security personnel.
- Prohibit pets from the project site.
- Minimize the use of rodenticides and herbicides in the project area.
- Consult with the USFWS and the Energy Commission regarding appropriate protection measures for sensitive species following resolution of an emergency that takes place in sensitive species habitat during clean-up activities.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

The applicant has recommended that a worker environmental awareness program be developed and implemented that informs all employees, as well as employees of contractors, about the sensitive biological resources associated with the PEF project.

DESIGNATED BIOLOGIST

The applicant has recommended that a biologist be hired, and approved by the Energy Commission and the USFWS, that has appropriate education and field experience suitable to the proposed project. This biologist, to be identified as the Designed Biologist, shall advise the project owner's Resident Engineer on the implementation of the various biological resource mitigation measures, supervise and/or conduct mitigation, monitoring, and compliance measures, and notify the project owner and the Energy Commission of any non-compliance with any biological resources recommended mitigation measure. The Resident Engineer shall act on the advice of the Designated Biologist to ensure conformance with the biological resources mitigation measures.

HABITAT RECLAMATION

The applicant proposes to complete the following habitat reclamation work:

- Complete, and institute, a habitat reclamation plan once temporarily disturbed habitat disturbance is completed. Annual inspections will occur for three (3) years to check for compliance with the reclamation plan goals.

- Recontour creek beds disturbed during pipeline construction so that drainage patterns are not changed from pre-construction conditions. Restore native riparian scrub or freshwater marsh plants in the disturbed sections of the creek.

COMPLIANCE REPORTING

The applicant has suggested the following compliance reporting strategy:

- Conduct compliance inspections once per week and provide an annual compliance report to the Energy Commission and the USFWS.
- Provide a post-construction compliance report, within forty-five (45) calendar days of completion of the project, to the Energy Commission and the USFWS.

HABITAT COMPENSATION

The applicant proposes to acquire compensation lands to satisfy the requirements of the federal Endangered Species Act. Habitat compensation will be consistent with standard USFWS compensation requirements for impacts to listed species habitat. The applicant proposes that title of the compensation habitat be transferred to a suitable land management institution. The applicant also proposes to provide an endowment for the perpetual care of the compensation habitat.

HABITAT CONSERVATION PLAN

Prior to the start of any ground disturbance activities, the project owner shall provide final copies of the project's Habitat Conservation Plan (HCP) per Section 10 of the federal endangered species act. The applicant proposes to incorporate the terms of the HCP into the project's final mitigation and monitoring plan.

CALIFORNIA DEPARTMENT OF FISH AND GAME STREAMBED ALTERATION AGREEMENT

The applicant has correctly identified that construction of the fuel supply pipeline and flood control berm improvements will require the acquisition of a Streambed Alteration Agreement from the California Department of Fish and Game per section 1601/1603 of the Fish and Game Code.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

The applicant has agreed to submit a Biological Resources Mitigation Implementation and Monitoring Plan for review and approval by the Energy Commission and the USFWS prior to the start of any ground disturbance activity.

FACILITY CLOSURE PLAN

The applicant has proposed to incorporate measures into the planned permanent or unexpected permanent closure plan that will be required for this project to address the local biological resources during facility closure.

STAFF'S RECOMMENDED MITIGATION

IMPACT AVOIDANCE MEASURES

Staff recommends that the applicant's recommended sensitive species impact avoidance measures are incorporated into their draft Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). For more information about the BRMIMP, refer to Biological Resources Condition of Certification **BIO-9**.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

Staff supports the applicant's recommendation that a Worker Environmental Awareness Program be developed and approved by the CEC for the proposed project. For more information about the Worker Environmental Awareness Program, refer to Biological Resources Condition of Certification **BIO-4**.

DESIGNATED BIOLOGIST

Staff supports the applicant's recommendation that the project owner designate a qualified biologist to act as the PEF Designated Biologist. The Designated Biologist must be identified and approved prior to project construction, and will be responsible for making certain that the project is constructed and operates in compliance with all state and federal biological resources laws, ordinances, regulations, and standards. For more information about the Designated Biologist, refer to Biological Resources Conditions of Certification **BIO-1**, **BIO-2**, and **BIO-3**.

HABITAT RECLAMATION

Staff supports the applicant's recommendation that the project owner implement required habitat reclamation measures. Required habitat reclamation measures will be provided as part of the California Department of Fish and Game's Streambed Alteration Agreement, the Corps of Engineer's Nationwide Permit, and local reclamation requirements. Tejon Ranch will need to provide information about the seed mix that they prefer be used. All habitat reclamation measures will be included in the project's BRMIMP. For more information about the BRMIMP, refer to Biological Resources Condition of Certification **BIO-9**.

COMPLIANCE REPORTING

The applicant's recommended compliance reporting will be reviewed and approved by Energy Commission staff and the USFWS then included in the project's BRMIMP. For more information about the BRMIMP, refer to Biological Resources Condition of Certification **BIO-9**.

HABITAT COMPENSATION AND ESTABLISHMENT OF AN OPEN SPACE EASEMENT

The sensitive species list for Kern County is long because a significant portion of the natural habitat has been lost to various types of development, including energy development and agriculture. To adequately address habitat loss associated with the PEF, the applicant has proposed that mitigation funds be provided for habitat compensation.

Habitat compensation ratios to calculate the amount of compensation acreage to be purchased to compensate for the acreage to be disturbed have been developed for similar projects in Kern County. The following habitat compensation ratios (numbers of acres to be purchased per each acre to be impacted) have been recommended by staff and agreed to by the applicant:

TYPE OF HABITAT IMPACT	COMPENSATION RATIO
Permanent impacts to other private land	3.0:1
Temporary impacts to other private land	1.1:1

As of June 1st, 2000, the applicant (Knowlton 2000) has identified that the PEF direct impacts will result in the following permanent and temporary acreage losses and requires the following habitat compensation:

	Impact Acreages	X	Compensation Ratio	=	Compensation Acreages
Permanent loss of habitat	36.1-acres	X	3.0:1	=	108.3
Temporary loss of habitat	127.6-acres	X	1.1:1	=	140.4
TOTAL DIRECT IMPACTS ACREAGE					**248.7-acres**

Staff recommends that the required compensation funds be provided by the project owner to the Center for Natural Lands Management (CNLM), and that the funds be used to purchase no less than 248.7-acres of compensation habitat in the immediate vicinity of CNLM's Lokern Preserve within the Lokern Natural Area of western Kern County.

It is staff's opinion that the location of the proposed habitat compensation will, when completed, provide a significant overall net benefit to the local species and habitat protection efforts since at least 248.7cres of high quality habitat will be purchased and protected as part of the Lokern Preserve to compensate for the direct permanent loss of 36.1-acres and temporary disturbance of 127.6-acres.

To calculate the dollar amount needed for habitat compensation if CNLM is to assume responsibility for the habitat purchases, staff consulted Brenda Pace, CNLM Administrative Director. Ms. Pace indicated (Pace 2000) that the required amount must be large enough to cover all acreage purchases, as well as all administrative costs including initial and capital costs, and the establishment of a suitable endowment for perpetual care of the habitat.

The per acre costs identified by CNLM are:

- Average price per acre, acquisition expenses, and closing costs = **$680**;
- Initial and capital expenses = **$130**; and
- Endowment = **$390**

Total dollar amount required by CNLM = **$1200 per acre**

CNLM has indicated that they require $1200 per acre to assume the responsibility of purchasing the compensation habitat to add the required compensation acreage to the Lokern Preserve, so staff will require the applicant to provide **$298,440** (248.7-acres x $1200 per acre) to CNLM prior to the start of any project-related ground disturbance activity.

Additional habitat compensation funds may be required if more habitat is disturbed during project construction than is anticipated. For additional information about the required PEF habitat compensation, refer to Biological Resources Condition of Certification **BIO-10**. The habitat compensation strategy to be implemented by the applicant must also be described in the project's Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). For more information about the BRMIMP, refer to Biological Resources Condition of Certification **BIO-9**.

In addition to requiring that the applicant provide habitat compensation, the project owner must also secure an open space easement as part of its lease agreement with Tejon Ranch. The open space easement must address how at least 32-acres in the immediate vicinity of the proposed power plant will be managed to maintain the kit fox movement corridor. The approved lease agreement and open space easement must identify how the easement parcel(s) can, and can not, be used by Tejon Ranch so suitable kit fox habitat is maintained within the movement corridor. For more information about the open space easement, refer to Biological Resources Conditions of Certification **BIO-11**.

HABITAT CONSERVATION PLAN

Staff supports the applicant's recommendation that a Habitat Conservation Plan (HCP) be developed for the proposed project to be in compliance with Section 10 of the federal Endangered Species Act. Staff recommends that a copy of the HCP, and associated Implementing Agreement, be provided to the Energy Commission Compliance Project Manager. For more information about the HCP and Implementing Agreement, refer to Biological Resources Condition of Certification **BIO-6**.

Also part of federal Endangered Species Act compliance, the applicant must also acquire a USFWS Biological Opinion for the PEF project. Staff will require that a copy of the final Biological Opinion be provided to the Energy Commission. For more information about the federal Biological Opinion, refer to Biological Resources Condition of Certification **BIO-5**. Biological Opinion terms and conditions will be included in the project's BRMIMP and implemented during project construction and operation. For more information about the project BRMIMP, refer to Biological Resources Condition of Certification **BIO-9**.

CDFG STREAMBED ALTERATION AGREEMENT

Staff supports the applicant's recommendation that they acquire, and provide a copy of, the project's required California Department of Fish and Game Streambed Alteration Agreement. Staff requires that the agreement's terms and conditions are included in the project's BRMIMP. For more information on the Streambed

Alteration Agreement and the BRMIMP, refer to Biological Resources Condition of Certification **BIO-8** and **BIO-9**, respectively.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

Staff supports the applicant's proposal to create, and receive approval for, the project's final Biological Resources Mitigation Implementation and Monitoring Plan. Staff recommends that a draft BRMIMP be provided to staff prior to the Final Staff Assessment. For more information about the BRMIMP, refer to Biological Resources Condition of Certification **BIO-9**.

FACILITY CLOSURE

Staff supports the applicant's proposal to include recommendations on addressing the local biological resources in the project's closure plan when the project is to be closed. Closure plan biological resource recommendations will also be included in the project's BRMIMP. For more information about facility closure conditions, refer to Biological Resources Condition of Certification **BIO-12**. For more information about the BRMIMP, refer to Biological Resources Condition of Certification **BIO-9**.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

To be in compliance with applicable laws, ordinances, regulations and standards, the applicant must obtain, and build and operate PEF within the terms and conditions provided in a federal Biological Opinion and Habitat Conservation Plan (HCP) to be in compliance with Section 10 of the federal Endangered Species Act. A state Incidental Take Permit, per section 2081.1 of the Fish and Game Code, will <u>not</u> be needed for this project (Daniels 2000). However, the federal Biological Opinion and HCP will provide required mitigation measures to be implemented to comply with federal law. For further information on these documents, see Biological Resources Conditions of Certification **BIO-5** and **BIO-6**.

To make certain the project owner complies with all laws, ordinances, regulations, and standards and the biological resource mitigation measures associated with this project, the applicant must designate a biological resource specialist, prior to the beginning of any project-related ground disturbance, who is familiar with the biological resource issues of the PEF project. This specialist, identified as the Designated Biologist, will help ensure that all biological resources mitigation measures are complied with during project construction and operation. For more information about the roles and responsibilities of the Designated Biologist, see Biological Resource Conditions of Certification **BIO-1**, **BIO-2**, and **BIO-3**.

UNRESOLVED ISSUES, CONCLUSIONS, AND RECOMMENDATIONS

UNRESOLVED ISSUES

OPEN SPACE EASEMENT TO MAINTAIN HABITAT WITHIN HISTORIC KIT FOX MOVEMENT CORRIDOR

On June 5, 2000, the USFWS indicated a willingness to consider an open space easement for at least 32-acres near the PEF project to protect remaining kit fox corridor habitat. As of this staff assessment, staff does not know if Tejon Ranch will agree to the establishment of such an open space easement as part of the lease agreement with the project owner. If Tejon Ranch does agree to the establishment of a suitable easement, and the terms and conditions of the easement are agreeable to the USFWS and staff, then staff will need to receive written verification that a suitable easement will be part of the lease and will be established prior to the PEF Evidentiary Hearings.

FEDERAL BIOLOGICAL OPINION, HABITAT CONSERVATION PLAN AND IMPLEMENTING AGREEMENT

Since the project may impact federally listed species, in particular the San Joaquin kit fox, the project must acquire a federal Biological Opinion from the USFWS. In addition, the applicant must also write an Implementing Agreement for the project's Habitat Conservation Plan (HCP) and receive an approval of these documents from the USFWS.

On April 3, 2000, the applicant provided a draft HCP (PEF/Thompson 2000g) for Energy Commission staff and the USFWS to review. As of this staff assessment, the applicant has received encouraging comments from the USFWS. An updated version will be provided by the applicant for review in mid-June 2000.

The applicant has also agreed to create the legally binding Implementing Agreement that accompanies the HCP. This document identifies how the applicant and the USFWS will work together on implementing the required HCP.

The federal Biological Opinion (to be written by the USFWS) and the HCP/Implementing Agreement (to be written by the applicant) are not expected to be completed prior to the Commission Decision. However, the mitigation requirements that will be contained in these documents when they are completed must be included in the project's final BRMIMP prior to any project-related ground disturbance.

STATE STREAMBED ALTERATION AGREEMENT

Since the PEF fuel supply pipeline will cross several creeks during construction, the applicant will need to acquire a California Department of Fish and Game Streambed Alteration Agreement. Once this agreement is provided, the applicant must incorporate the agreement mitigation into the project's BRMIMP, and abide by them during project construction and operation.

FEDERAL CLEAN WATER ACT SECTION 404 AND STATE SECTION 401 CERTIFICATION

Since the PEF fuel supply pipeline will need to cross several creeks, the applicant must acquire various permits from the Army Corps of Engineers and the state's San Joaquin Valley Regional Water Quality Control Board. These permits are required to comply with provisions of the federal and state Clean Water Acts. Staff has received very little information about the progress of the PEF 404 certification work. The applicant needs to provide a status report of how and by when the applicant will acquire these permits, and the permit provisions must be incorporated into the PEF BRMIMP.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN (BRMIMP)

Only a draft BRMIMP outline has been provided by the applicant (PEF/Thompson 2000a). However, the applicant has compiled many recommended mitigation measures in the same filing that contains the draft BRMIMP outline. These recommended mitigation measures need to be merged with the draft BRMIMP, and staff must receive and review the draft mitigation and monitoring plan prior to staff's Final Staff Assessment. The draft plan must also be reviewed by the USFWS, and the applicant must make all necessary improvements to the plan, prior to the PEF Evidentiary Hearings.

CONCLUSIONS

Several important issues are currently unresolved, and various draft documents are not completed, so staff can not make a recommendation regarding whether or not this project should be certified. Completion of these documents and resolution of various unresolved issues will make it far easier for staff to conclude whether the project can be constructed and operate in compliance with various state and federal laws, ordinances, regulations, and standards and whether project approval is recommended.

RECOMMENDATIONS

To make certain that the PEF project complies with all laws, ordinances, regulations, and standards during project construction and operation, staff recommends that the Energy Commission adopt the following Biological Resources Conditions of Certification.

CONDITIONS OF CERTIFICATION

The following Biological Resources Conditions of Certification are proposed by Energy Commission staff.

DESIGNATED BIOLOGIST

BIO-1 Construction site and/or ancillary facilities preparation (described as any ground disturbing activity other than Energy Commission-approved

geotechnical work) shall not begin until an Energy Commission CPM approved Designated Biologist is available to be on site.

Protocol: The Designated Biologist must meet the following minimum qualifications:

1. A Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;
2. At least three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;
3. At least one year of field experience with biological resources found in or near the project area; and
4. An ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for the biological resources tasks that must be addressed during project construction and operation.

If the CPM determines the proposed Designated Biologist to be unacceptable, the project owner shall submit another individual's name and qualifications for consideration. If the approved Designated Biologist needs to be replaced, the project owner shall obtain approval of a new Designated Biologist by submitting to the CPM the name, qualifications, address, and telephone number of the proposed replacement. No disturbance will be allowed in any designated sensitive areas until the CPM approves a new Designated Biologist and the new biologist is on site.

Verification: At least 90 days prior to the start of any ground disturbance activities, the project owner shall submit to the CPM for approval, the name, qualifications, address and telephone number of the individual selected by the project owner as the Designated Biologist. If a Designated Biologist is replaced, the information on the proposed replacement, as specified in the condition, must be submitted in writing at least ten working days prior to the termination or release of the preceding Designated Biologist.

BIO-2 The CPM-approved Designated Biologist shall perform the following during project construction and operation:

1. Advise the project owner's Construction Manager on the implementation of the Biological Resource Conditions of Certification;
2. Supervise or conduct mitigation, monitoring and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as, wetlands and special status species; and
3. Notify the project owner and the CPM of non-compliance with any Biological Resources Condition of Certification.

Verification: During project construction, the Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted along with the Monthly Compliance Reports to the CPM. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

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

Protocol: The project owner's Construction Manager shall halt, if necessary, all construction activities in areas specifically identified by the Designated Biologist as sensitive to assure that potential significant biological resource impacts are avoided.

The Designated Biologist shall:

1. Inform the project owner and the Construction Manager when to resume construction, and
2. Advise the Energy Commission CPM if any corrective actions are needed or have been instituted.

Verification: Within two (2) working days of a Designated Biologist notification of non-compliance with a Biological Resources Condition of Certification or a halt of construction, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem or the non-compliance with a condition. For any necessary corrective action taken by the project owner, a determination of success or failure will be made by the CPM within five (5) working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

BIO-4 The project owner shall develop and implement a CPM-approved Worker Environmental Awareness Program in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or related facilities during construction and operation, are informed about the sensitive biological resources associated with the project area.

Protocol: The Worker Environmental Awareness Program must:

1. Be developed by the Designated Biologist and consist of an on-site or training center presentation in which supporting written material is made available to all participants;
2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
3. Present the reasons for protecting these resources;
4. Present the meaning of various temporary and permanent habitat protection measures; and
5. Identify whom to contact if there are further comments and questions about the material discussed in the program.

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

Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program materials. The person administering the program shall also sign each statement.

Verification: At least 60 days prior to the start of rough grading, the project owner shall provide copies of the Worker Environmental Awareness Program and all supporting written materials prepared by the Designated Biologist and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. The signed statements for the construction phase shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six (6) months after the start of commercial operation. During project operation, signed statements for active project operational personnel shall be kept on file for the duration of their employment and for six (6) months after their termination.

U. S. FISH & WILDLIFE SERVICE SECTION 10 BIOLOGICAL OPINION, HABITAT CONSERVATION PLAN, AND IMPLEMENTING AGREEEMNT

BIO-5 Prior to the start of any ground disturbance activities, the project owner shall provide the CPM with a final copy of the PEF Section 10 Biological Opinion Act obtained from the U. S. Fish and Wildlife Service in accordance with the federal Endangered Species Act.

Verification: At least 60 days prior to the start of any project-related ground disturbance activities the project owner shall submit to the CPM a copy of the federal Section 10 Biological Opinion. The PEF Section 10 Biological Opinion terms and conditions will be incorporated into the final BRMIMP and implemented during project construction and operation. For more information about the BRMIMP, see Biological Resources Condition of Certification **BIO-9**, below.

BIO-6 Prior to the start of any project-related ground disturbance activities, the project owner shall provide the CPM with a final copy of the PEF Habitat Conservation Plan and Implementing Agreement in accordance with the federal Endangered Species Act.

Verification: At least 60 days prior to the start of any project-related ground disturbance activities the project owner shall submit to the CPM a copy of the PEF Habitat Conservation Plan and Implementing Agreement. The PEF Habitat Conservation Plan and Implementing Agreement terms and conditions will be incorporated into the final BRMIMP and implemented during project construction and operation. For more information about the BRMIMP, see Biological Resources Condition of Certification **BIO-9**, below.

U. S. ARMY CORPS OF ENGINEERS NATIONWIDE PERMITS

BIO-7 Prior to the start of any project related ground disturbance activities, the project owner shall submit to the CPM a copy of the U. S. Army Corps of Engineers Nationwide Permits setting forth the requirements for compliance with the federal Clean Water Act.

Verification: At least 60 days prior to the start of any project-related ground disturbance activities the project owner shall submit to the CPM a copy of the PEF Nationwide Permits. The PEF Nationwide Permits terms and conditions will be incorporated into the final BRMIMP and implemented during project construction and operation. For more information about the BRMIMP, see Biological Resources Condition of Certification **BIO-9**, below.

CALIFORNIA DEPARTMENT OF FISH AND GAME STREAMBED ALTERATION AGREEMENT

BIO-8 The applicant will acquire and implement the terms and conditions of a California Department of Fish and Game Streambed Alteration Agreement.

Verification: At least 60 days prior to the start of any project-related ground disturbance activities, the applicant will provide the CPM with a copy of the final CDFG Streambed Alteration Agreement. The terms and conditions of the agreement will be incorporated into the project's BRMIMP. For more information regarding the BRMIMP, see Biological Resources Condition of Certification **BIO-9**, below.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

BIO-9 The project owner shall submit to the CPM for review and approval a copy of the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and shall implement the measures identified in the plan. Any changes made to the adopted BRMIMP must be made in consultation with Energy Commission staff and the USFWS.

Protocol: The final BRMIMP shall identify:

1. All biological resources mitigation, monitoring, and compliance conditions included in the Energy Commission's Final Decision;
2. All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation and closure;
3. All mitigation measures identified in the USFWS Section 10 Biological Opinion, the applicant's Habitat Conservation Plant, and Implementing Agreement.
4. All required mitigation measures/avoidance strategies for each sensitive biological resource including the undescribed Mariposa lily (*Calochortus* sp.);

5. Required habitat compensation strategy, including provisions for acquisition, enhancement and management, for any temporary and permanent loss of sensitive biological resources;
6. All locations, on a map of suitable scale, of laydown areas and areas requiring temporary protection and avoidance during construction;
7. Aerial photographs of all areas to be disturbed during project construction activities - one set prior to site disturbance and one set after completion of mitigation measures. Include planned timing of aerial photography and a description of why times were chosen;
8. Duration for each type of monitoring and a description of monitoring methodologies and frequency;
9. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
10. All performance standards and remedial measures to be implemented if performance standards are not met;
11. A discussion of biological resource-related facility closure measures;
12. A process for proposing plan modifications to the Energy Commission CPM and appropriate agencies for review and approval;
13. Terms and conditions contained in the project's federal 404 Clean Water Act and state 401 certification and CDFG Streambed Alteration Agreement; and
14. A copy of the signed project owner/Tejon Ranch lease agreement containing an open space easement.

Verification: At least 60 days prior to start of any project-related ground disturbance activities, the project owner shall provide the CPM with the final version of the BRMIMP, and the CPM will determine the plan's acceptability within 15 days of receipt of the final plan. All modifications to the approved BRMIMP must be made only after consultation with Energy Commission staff and the USFWS. The project owner shall notify the CPM five (5) working days before implementing any CPM-approved modifications to the BRMIMP.

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

HABITAT COMPENSATION

BIO-10 To compensate for temporary and permanent impacts to sensitive species habitat, the project owner will provide at least $298,440 to the Center for Natural Lands Management.

Verification: To account for inflation and other anticipated changes in habitat compensation costs, the project owner will consult the Center for Natural Lands Management (Brenda Pace, 541-330-5533) no less than 90 days prior to the start of any project related ground disturbance, and CNLM will identify the final cost per acre and total compensation amount. Once the final habitat compensation amount has been determined and no less than 60 days prior to the start of any project

related ground disturbance activities, the project owner will provide written verification to the CEC CPM that all habitat compensation funds (including the endowment) have been provided to CNLM.

Within 90 days after completion of project construction, the project owner shall provide aerial photographs to the CPM that were taken after construction. The project owner shall also provide an analysis of the amount of any additional habitat disturbance than that identified in this staff assessment. The CPM, in consultation with CNLM, will notify the project owner of any additional funds required to compensate for any additional habitat disturbances at the adjusted market value at the time of construction to acquire and manage habitat.

OPEN SPACE EASEMENT

BIO-11 The applicant, in consultation with Tejon Ranch, the USFWS, and Energy Commission staff, will develop a suitable lease containing an open space easement for an area of no less than 32 acres in the immediate vicinity of the power plant plan site within the San Joaquin kit fox movement corridor.

Verification: At least 60 days prior to start of any project-related ground disturbance activities, the project owner shall provide the CPM with the final approved version of the BRMIMP. A copy of the project owner/Tejon Ranch approved and signed lease containing an open space easement shall be included in the final BRMIMP.

FACILITY CLOSURE

BIO-12 The project owner will incorporate into the planned permanent or unexpected permanent closure plan measures that address the local biological resources. The biological resource facility closure measures will also be incorporated into the PEF BRMIMP.

Protocol: The planned permanent or unexpected permanent closure plan will require the following biological resource-related mitigation measures:

1. Removal of transmission conductors when they are no longer used and useful;
2. Removal of all power plant site facilities; and
3. Measures to restore wildlife habitat to promote the re-establishment of native plant and wildlife species.

At least 12 months (or a mutually agreed upon time) prior to the commencement of closure activities, the project owner shall address all biological resource-related issues associated with facility closure in a Biological Resources Element. The Biological Resources Element will be incorporated into the Facility Closure Plan, and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

Verification: At least 12 months (or a mutually agreed upon time) prior to the commencement of closure activities, the project owner shall address all biological resource-related issues associated with facility closure in a Biological Resources Element. The Biological Resources Element will be incorporated into the Facility Closure Plan, and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

REFERENCES

CEC (California Energy Commission/Lewis) 2000a. Pastoria Energy Facility Issues Identification Report. Submitted to California Energy Commission on March 3, 2000.

California Native Plant Society. 1994. California Native Plant Society Inventory of Rare and Endangered Vascular Plants of California. Special Publication Number 1, 5th edition.

Cross, Peter. 2000. Non-published map of historic San Joaquin kit fox locations near proposed PEF power plant site. Map presented at May 10th, 2000 meeting at U. S. Fish and Wildlife Service office in Sacramento.

Knowlton, Anne. 2000. E-mail tables to Rick York identifying anticipated PEF acreage impacts.

Pace, Brenda. 2000. E-mail response to Rick York regarding questions about anticipated habitat compensation costs to add acreage to CNLM Lokern Preserve.

PEF 1999a. Application for Certification. Submitted to the California Energy Commission on November 30, 1999.

PEF/Parquet 2000a. Project description clarification. Submitted to the California Energy Commission on March 1, 2000.

PEF/Thompson 2000a. Recommended mitigation measures and draft compliance plans/outlines. Submitted to the California Energy Commission on March 6, 2000.

Scholl, Jennifer. 2000a. Responses to data requests. Submitted to the California Energy Commission on March 13, 2000.

Therkelsen, Robert. 2000. Letter to Karen Miller of the USFWS regarding growth-inducing impacts and power plant development in California. Letter written February 3, 2000.

USFWS (U. S. Fish and Wildlife Service) 1998. Recovery plan for upland species of the San Joaquin Valley, California.

USFWS 2000. Letter to Field Office Manager, Bureau of Land Management, Bakersfield, California, regarding Section 7 consultation for the western expansion project, Midway Sunset Cogeneration Company. Letter received by the California Energy Commission on June 1, 2000.

SOILS AND WATER RESOURCES

Lorraine White

INTRODUCTION

This section of staff's Preliminary Staff Assessment (PSA) analyzes potential effects on soil and water resources by the Pastoria Energy Facility (PEF), specifically focusing on the potential for the project to induce erosion and sedimentation, adversely affect surface and groundwater supplies, and degrade surface and groundwater quality. Also addressed by staff in this analysis is the project's ability to comply with all applicable federal, state and local laws, ordinances, regulations and standards. Where the potential for impacts is identified, staff proposes mitigation measures to reduce the significance of the impact and, as appropriate, recommends conditions of certification.

Flooding and drainage issues are addressed in the **Facility Design**, and **Geology and Paleontology** chapters of this document. Solid waste disposal is discussed in the Waste Management section of this PSA.

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 stormwater discharges are delegated to, and administered by, the nine Regional Water Quality Control Boards (RWQCB). Section 404 of the act regulates the discharge of dredged or fill material into waters of the United States, including rivers, streams and wetlands. Site-specific or general (nationwide) permits for such discharges are issued by the Army Corp of Engineers (ACOE) and are certified by the Regional Water Quality Control Boards.

STATE

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 project area are contained in the Water Quality Control Plan for the Tulare Lake Basin (1995). The Porter-Cologne Water Quality Control Act also requires the SWRCB and the 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 a Waste Discharge Requirement which specifies conditions regarding the construction, operation, monitoring and closure of the waste disposal site, including injection wells for waste disposal.

STATE WATER RESOURCES CONTROL BOARD POLICY 75-58

The SWRCB has also adopted a number of policies that provide guidelines for water quality protection. The principle policy of the State Board 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 use of fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. This SWRCB policy requires that power plant cooling water should, in order of priority come from 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.

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. A number of the proposed PEF linear facilities cross ephemeral drainages that are considered waters of the United States. For the PEF, the Central Valley RWQCB will issue the 401 certification for this project.

LOCAL

Kern County Code of Building Regulations, Chapter 17.28 sets forth grading requirements.

Kern County Environmental Health Department specifies permit requirements for onsite water treatment facilities that serve less than 25 people (not just employees) more than 60 days a year.

Kern County Development Standards (Division IV) and Hydrology Manual specify requirements for drainage systems and facilities.

ENVIRONMENTAL SETTING

PEF, LLC proposes to build a nominal 750 MW electric generating facility in the southeast portion of the lower San Joaquin Valley at the base of the Grapevine on the Tejon Ranch. The Valley is bounded on the southeast by the Tehachapi Mountains and on the southwest by the Emigdio Mountains. Currently undeveloped, the 30-acre power plant site is located just north of the Edmonston Pumping Plant, approximately 6.5 miles east of Interstate 5 and 30 miles south of Bakersfield. The large site is intended for possible expansion in the future if market conditions prove favorable. Adjacent to the power plant site, a 25-acre temporary construction laydown area is proposed.

Several new linear facilities will also be required. Access to the site will be accomplished through the construction of a 0.85 mile road (Route 5) from Edmonston Pumping Plant Road across Tejon Ranch and DWR property. To connect the power plant to SCE's Pastoria Substation south of the plant site, the applicant will construct a 1.38-mile 230 kV transmission line (Route 1). Natural gas will be delivered to the power plant via a nearly 12 mile long pipeline (Route 3) to the tie-in point of the Kern River/Mojave Pipeline approximately 6.5 miles north (PEF 1999a). In their supplemental filing to the AFC, the applicant indicated that zero discharge of wastewater was their preferred alternative (PEF 2000a). Since then the Applicant has eliminated consideration of deep well injection of wastewater into the Tejon Oil Field and thus the need for a wastewater discharge pipeline (Route 4) (Staff workshop, March 14, 2000). Water will be supplied to the plant via an interconnection to an existing 24-inch water pipeline approximately 0.2 miles north of the plant site (Route 2a). The original water supply route (Route 2) is no longer being considered. Please refer to **Project Description** Figure 1 for a depiction of the proposed project.

Just southeast of the proposed power plant site, lies the active Griffith Company gravel quarrying operation. An abandoned quarry lies approximately 0.5 miles south of the site. Depth of the quarry is approximately 100 feet. According to the Applicant, Griffith Company plans to expand their operations to the southeast and does not expects to impact the project site (PEF 1999a, p.3.3-1, 5.3-3, 5.3-21).

Annual precipitation in this area is approximately 12 inches (measured at Lebec located 8 miles south of the plant site) with nearly 90 percent of the rainfall occurring between the months of November and April. The evaporation rate is 82 inches resulting in minimal natural groundwater recharge. The region also experiences a long growing season (PEF 1999a, p. 3.3-3, 5.5-3, Table 5.5-2).

To date, the proposed site has been used for cattle grazing and is currently under a Williamson Act contract. For more discussion of the issues surrounding cancellation of the Williamson Act contract and changes in land use on this parcel, please refer to the **Land Use** chapter of this PSA.

SOILS

Located at the foot of the Tehachapi Mountains in the alluvial fan of Pastoria Creek, the PEF site is relatively flat with a 4 percent slope running from southeast to northwest. Existing elevation of the site ranges from 1,058 feet to 1,088 feet. The site will be tiered to conform to the existing grades with an estimated average final elevation of approximately 1,070 feet (PEF 1999a, p.3.3-1, PEF/Thompson 2000a, Draft Erosion Control and Stormwater Management Plan).

The proposed power plant is to be located on recent alluvium. Site soils are coarse grained flanglomerate deposited mostly by debris flows with higher percentage of gravel present beneath the sloping alluvium near the base of the foothills. This flanglomerate is composed of sand, gravel, cobble and boulders with little silt and almost no clay. Observed soils at the site consist mostly of coarse grained unconsolidated alluvium subject to erosion (PEF 1999a, section 5.3).

In November 1999, a subsurface exploration program was completed at the site. The Applicant reported that their investigation found gravelly sands consisting mainly of well graded course grained sands with a gravel content of 30-60 percent. These deposits make-up the alluvial fan of Pastoria Creek (PEF 1999a, section 3).

Predominate soils in the area of the project are sandy loam, fine sandy loam, gravelly sandy loam and sandy loam soils. Representative soils include Hesperia sandy loam: very deep, well-drained sandy loam soils, moderately rapid permeability, slow runoff and low shrink-swell potential; and the Pleito-Chanac sandy clay loam: very deep well drained, occurring on moderately steep alluvium and old terraces, has low to moderately slow permeability, rapid runoff and moderate shrink-swell potential. Water and wind erosion susceptibility for these soils is low to moderate but increases with the removal of vegetation and excessive cattle grazing or irrigation.

Soils mapping units at the plant site and construction laydown area are primarily Hesperia sandy loam (22 acres/16 acres) and Psamments-Xerolls complex (8 acres/9acres). Hesperia sandy loam characteristics are very deep, well-drained, low shrink-swell potential, and moderately susceptible to wind and water erosion. Psamments-Xerolls complex, with its coarse and moderately coarse surface soils, is very deep, excessively to moderately well-drained. This soil mapping unit has a high water erosion susceptibility but is rated low for wind erosion.

Along the proposed transmission route (Route 1), only Hesperia sandy loam is encountered. This is also true of the originally proposed water supply line route (Route 2). Route 5, the access road from Edmonston Pumping Plant Road, will cross Hesperia sandy loam and Psamments-Xerolls complex soil mapping units.

Five soil mapping units were identified along the proposed wastewater discharge line (Route 4). These included Hesperia sandy loam, Pleitito-Laval complex, Riverwash, Cuyama sandy loam and Guijarral sandy loam. Pleitito-Laval complex is very deep sandy loam soils with moderately rapid permeability, low shrink swell potential, low water and moderate wind erosion hazard. This complex is frequently

flooded. Riverwash is unstable sediments (sand, silt, gravel and/or clay) that are reworked frequently by flood action and tend to be unable to support vegetation. Cuyama sandy loam is very deep, well-drained soils with moderately slow permeability, low shrink-swell potential and moderate susceptibility to water and wind erosion. Guijarral sandy loam is also very deep, well-drained soils with low shrink-swell potential, but with moderately rapid permeability, moderate water erosion hazard and low wind erosion hazard. A portion of this route is now going to be used for the preferred water supply route (Route 2a).

The preferred natural gas pipeline (Route 3) will traverse eleven soil mapping units. Alternate Route 3A would encounter 13 and alternate Route 3 B would encounter 16 different units. Portions of these routes traverse hilly terrain with steep slopes. Most of the soil mapping units have moderate erosion susceptibility ratings, but erosion susceptibility, particularly along steep slopes will increase once the vegetation is removed. For information on the specific characteristics of the soil units discussed in this subsection, please refer to the AFC, Section 5.4, Table 5.4-1 and Map 5.4-1.

Using a shallow test pit (~2 feet deep), the Applicant determined infiltration rates at the site of the septic tank to be 10 feet a day vertical infiltration (PEF 1999a, pg. 3.3-2). The applicant suggests that 10-15 gallons per minute percolate into the ground within a mile upstream of site.

SURFACE WATER BODIES

Surface water bodies in the vicinity of the proposed power plant site include Pastoria Creek and the California Aqueduct. Although not naturally occurring, the California Aqueduct which is owned and operated by the California Department of Water Resources (DWR) State Water Project (SWP) passes through the Tejon Ranch as it travels to DWR's Edmonston Pump Plant approximately 1.5 miles southeast of the site. At its closest point to the plant, the Aqueduct is 4,000 feet to the south. An ephemeral stream, Pastoria Creek drains a watershed of approximately 51 square miles out of the Tehachapi Mountains through Pastoria Canyon. It flows through a gap in the aqueduct and passes approximately 1,000 feet to the west of the plant site tending north (PEF 1999a). As proposed, the project's access road and water supply line will cross Pastoria Creek while the transmission line will span it. At the aqueduct, peak flows of 3,600 cubic feet per second (cfs) have been recorded. Based on measurements taken between 1966 and 1978, peak annual flows of Pastoria Creek range from 12.4 to 200 cfs (PEF 1999a, p.5.5-12, Table 5.5-1). The plant site is located in the 100-year floodplain of this drainage. For more discussion of flooding and surface hydrology, please see the **Geology and Paleontology** chapter of this PSA.

Several ephemeral creeks and drainages will be crossed by the proposed natural gas pipeline and or alternate routes. The streams include Tunis Creek, El Paso Creek, Caparell Creek and Tejon Creek (PEF 1999a, p. 5.5-13, Tables 5.5-4 and 5.5-5). These creeks and drainages tend to be dry in the summer. Only Tunis and El Paso Creek were reported to have water during the summer of 1999. El Paso Creek drains an area of approximately 33 square miles. Peak annual flows as

measured by the USGS for 1975 and 1978 were 59 cfs and 528 cfs, respectively. Tejon Creek drains approximately 110 square miles with peak annual flows recorded in 1977 and 1978 of 6.8 cfs and 1,050 cfs respectively (PEF 2000a, WTR-5, p. WTR 6&7). Water quality data is only available for Tejon Creek. This Creek is only crossed by Alternate Route 3B and it is unclear if it is representative of the water quality of other creeks and drainages in the area, specifically Pasotria Creek (PEF 2000a, WTR 7&8). Limited information is available on these creeks and drainages and neither staff nor the Applicant have yet found any additional information.

GROUNDWATER

Groundwater in this area of the valley generally occurs at depths below 180 feet below the surface. The gravel pit located adjacent to the proposed site is approximately 100 feet deep and has not encountered any groundwater. It is possible that shallow, possibly perched water is present near the mouths of stream valleys such as Tejon, Tunis and El Paso Creeks. Information from a well 5 miles to the west documents a water table at 1,000 feet below grade surface. It is estimated that groundwater at the site and along the linear routes is about 500 feet below the surface (PEF 1999a). Fresh water aquifers extend down to 1,100 to 1,700 feet below surface and are hydraulically separated from oil bearing strata below at approximately 2,800 to 3,000 feet. It was this lower strata that the Applicant originally intended to discharge its wastewater to (PEF 2000a, WTR 4, Appendix 9).

WHEELER RIDGE-MARICOPA WATER STORAGE DISTRICT

The primary supplier of water to the PEF is the Wheeler Ridge-Maricopa Water Storage District (WRMWSD). Currently, WRMWSD is entitled to 197,088 acre-feet a year from the SWP (this contract runs through 2035) and delivers 190,000 acre-feet to its customers in a normal year. The SWP water is provided to the District through the Kern County Water Agency. Prior to receiving resources through the SWP, reservoir aquifers the District used were subject to overdraft. No surface water use and an active banking program has resulted in a rise in the area's water table (PEF 2000a, WTR 4, Appendix 9).

In addition to the contracted allocation, the District is also entitled to flood flows or interruptible water that is usually available January to March. During those years with the worse hydrologic conditions, WRMWSD has received at least 60,000 acre-feet a year of water from the SWP (PEF 1999a, Table 3.4.8-6, p. 3.4-40). In addition to the SWP supplies, WRMWSD also has stored water in their storage basins on the order of 743,000 acre-feet within the District boundaries and 243,000 acre-feet outside these boundaries. The District is currently analyzing an additional storage project in the White Wolf Basin that would add as much as 50,000 acre-feet of water supplies to the District's resources (PEF 1999a, p. 5.5-2). WRMWSD can also purchase stored groundwater from the Kern County Water Agency if demand requires. According to Bill Taube with WRMWSD, water rights of the District's customers exceeds water allocations of the SWP, but because the demands are below the actual rights, the District has been able to meet its customers demands to date (ROC 5/25/00).

The applicant has contracted with WRMWSD under a long-term Industrial Water Service Agreement to provide the PEF with water from the District's turnback pool, firm conveyance through the District's facilities and interruptible conveyance through the Aqueduct. According to the applicant, the WRMWSD developed a new rate class for customers with high reliability requirements such as PEF (PEF 1999a, p. 5.5-1). Excess water from the District's users can be put into or turned-back to a "pool" for use in banking of water supplies or for resale to other customers. The District's pool water is on a "as available, when available" basis, dependent on excess water being made available to others in the District's system. Conveyance capacity within the district's facilities will be provided to PEF for its back-up water service, however, since the district has little control over conveyance capacity in the Aqueduct, it can not guarantee this SWP conveyance capacity.

Staff has requested and is awaiting information from WRMWSD on the availability of the district's pool water and what future availability to PEF may be.

AZURIX

Azurix describes itself as a global water company that owns, operates and manages water and wastewater assets, provides water and wastewater-related services, and develops and manages water resources (Azurix 2000). Azurix is a subsidiary of Enron Corporation that maintains a 34 percent ownership (Business Week 2000). Azurix has undertaken projects in the United States, Canada, Brazil, India and the United Kingdom. Major projects being undertaken by Azurix in California include an agreement with J.G. Boswell Co. of Pasadena (a major cotton grower in the state) that will result in water exchange options of 100,000 acre-feet annually for southern California water districts (Wall Street Journal 2000) and development of a groundwater storage project in Madera County.

PEF, LLC has entered into an agreement with Azurix for back-up water supplies and water resource management services. Azurix is currently negotiating contracts with local parties to secure options to purchase or exchange banked water supplies held by these parties. It is anticipated that water will be delivered through exchanges of the groundwater for State Water Project (surface) water assuming the water is freely transferable. Staff requested that the applicant supply additional information on the banked water supplies and any reviews or approvals that pertain to these programs. Azurix's water resources will be discussed further in the FSA.

SOILS & WATER RESOURCES TABLE 1
California Aqueduct Water Quality

Constituents	Mean Concentration (Variability)
Cations	
Calcium	18 mg/L (12-27 mg/L)
Magnesium	9 mg/L (5-13 mg/L)
Sodium	34 mg/L (19-52 mg/L)
Iron	< 0.005 mg/L
Manganese	< 0.005 mg/L
Hardness	84 mg/L (52-121 mg/L)
Anions	
Sulfate	33 mg/L (20-55 mg/L)
Chloride	39 mg/L (20-62 mg/L)
Fluoride	< 0.1 mg/L (< 0.1 mg/L- 0.2 mg/L)
Bromide	0.13 mg/L (0.06-0.18 mg/L)
Nitrate + Nitrite	0.55 mg/L (0.36-0.79 mg/L)
Phosphorus (total)	0.13 mg/L (0.04-0.23 mg/L)
Alkalinity	71 mg/L (41-109 mg/L)
Metals	
Arsenic	0.002 mg/L (0.001-0.003 mg/L)
Boron	0.2 mg/L (0.1-0.2 mg/L)
Chromium	<0.005 mg/L (<0.005 mg/L - 0.007 mg/L)
Copper	0.002 mg/L (to 0.003 mg/L)
Lead	< 0.001 mg/L
Selenium	< 0.001 mg/L
Zinc	< 0.005 mg/L
Other	
TOC	3.7 mg/L (2.5-9 mg/L)
Turbidity	34 NTU* (3-140 mg/L)
TDS	189 TDS (114-249 mg/L)
Sp. Conductance	339 µS/cm** (205-436 mg/L)
THM Formation Potential	372 µg/L (303-485 mg/L)

Source: Pastoria Energy Facility, LLC. 1999a. Table 3.4.8-2.
* Nephelometric Turbidity Unit
** MicroSiemens per centimeter

ENVIRONMENTAL IMPACTS

PROJECT SPECIFIC

PEF, LLC has proposed to construction, own and operate a nominal 750 MW natural gas fired power plant. Located in the southern San Joaquin Valley at the base of the Grapevine, the project site will be approximately 30 acres and a temporary 25-acre construction laydown area will be located adjacent to the plant. The applicant proposes to construct berms (about three feet high and broad across the top to blend in with the topography) between the plant site and Pastoria Creek for flood control. In addition several linear facilities are proposed including a transmission line, natural gas pipeline and a water supply line. The Applicant anticipates an overall availability of greater than 95 percent, operating the facility up to 8,760 hours per year (PEF 1999a).

Water used at the PEF will be for cooling make-up, potable water, plant service water and demineralized water for the heat recovery steam generators (HRSG) and combustion turbine generators (CTG) make-up (PEF 1999a, p.3.1-2). As proposed, the PEF will require an annual average of 2,443 gpm (3,940 acre-feet a year) of water and a summer maximum of 4,351 gpm (7,017 acre-feet a year) (PEF/Thompson 2000f, Revised Table 3.4.8-1; PEF/Thompson 2000h). Soils & Water Resources Table 2 provides a general breakdown of water demand for PEF. The power plant will be equipped with 24 cooling tower cells (a 16-cell bank and an 8-cell bank). This cooling tower is standard mechanical draft wet cooling system incorporating drift eliminators that control drift to less than 1 gallon per minute. Water storage facilities include a 2.3 million-gallon make-up storage tank that contains a reserve for firewater. This storage capacity represents 5 hours of water supply for peak operation as well as 3 hours of flow for fire protection. The fire water reserve is only accessible by fire personnel. In addition, the plant will be equipped with a 150,000 gallon demineralized water storage tank (24 hour supply) and a 1,000 gallon potable water storage tank (a 7 day supply) (PEF 1999a, Table 3.4.1-1, Section 3.4 and p. 3.5-3). For a more detailed discussion of the proposed project, please see the **Project Description** chapter of this PSA.

SOILS & WATER RESOURCES TABLE 2

Estimated Water Demand for the PEF

Project Element	Water Type	Quantity*
Peak Operating Conditions - 114 Degrees F, 10 Cycles of Concentration		
Cooling Towers	Aqueduct	4,628 gpm/6.7mgd
Industrial Processes and Domestic Uses		
Evaporative Cooling		184 gpm
Makeup for HRSG		63 gpm
Cooling Tower Makeup		3 gpm
Treatment		
Total Process Requirements		4,327 gpm/6.2mgd
Total	Potable	23 gpm/0.03 mgd
Average Operating Conditions - 64 Degrees F, 10 Cycles of Concentration		
Cooling Towers	Aqueduct	2627 gpm/3.8 mgd
Industrial Processes and Domestic Uses		
Evaporative Cooling		53 gpm
Makeup for HRSG		41 gpm
Cooling Tower Makeup		2 mgd
Treatment		
Total Process Requirements		2,419 gpm/3.5 mgd
Total	Potable	23 gpm/0.03 mgd

* Source: AFC Revised Table 3.4.8-1; Attachment 13, Responses to Data Requests, April 3, 2000.

EROSION CONTROL AND STORMWATER MANAGEMENT

Accelerated wind and water induced erosion may result from earth moving activities associated with construction of the proposed project. Removal of the vegetative cover and alteration of the soil structure leaves soil particles vulnerable to detachment and removal by wind or water. Construction and maintenance-related erosion is of particular concern in areas of steep slopes and sandy soils. Increasing the amount of impervious surfaces will increase the amount of runoff and peak discharges from a development. Rainfall can greatly enhance the potential for water erosion. Grading activities may redirect runoff into areas more vulnerable to erosion. Areas where linear facilities cross drainages or steep sloped terrain are also vulnerable to erosion.

Soils that will be affected by the proposed project range in the rated susceptibility to erosion from low to high. Once the protective cover of vegetation is removed and the structure of the surface soil has been altered, however, all of these soils can be highly vulnerable to erosion.

Site preparation will include excavation, grading, removal of vegetation and storage and disposal of various materials. Construction of the project can result in increased wind and water erosion and increase in sediment loading of creeks and drainages. To minimize grading requirements, the site is to be tiered. To obtain the desired site elevations, the site will be cut and filled, requiring the movement of approximately 120,000 yards of material during grading. This includes 10,000 yards of soil for the berms needed to protect the site against potential flooding from Pastoria Creek. Vegetation will be removed and disposed of on-site as appropriate. Some vegetation removal and earth moving activities will also be needed for the construction laydown area. Surface materials to be used at the site will include concrete, asphalt and or gravel. Graded surfaces will have a mild slope resulting in surface runoff flowing toward the detention ponds. Slopes on the north and west of the site will be between 4 and 5 percent. It is anticipated that the only imported soils needed for the construction of the power plant will be base rock for roads and structures. Frequently traveled on-site roads will be paved while those with less access requirements will be covered with crushed rock or gravel surfaces. Permanent access roads needed to maintain project linear facilities are expected to be 40 feet in width (PEF 1999a; PEF/Thompson 2000a, Draft Erosion Control and Stormwater Management Plan).

New temporary and permanent disturbances will occur as a result of constructing and operating the new linear facilities (see Soils & Water Resources Table 3). As stated earlier, several creeks and drainages will be impacted by the proposed project. Route 5, the access road, will cross Pastoria Creek. The Applicant proposes to install a culvert so that the road will pass over the creek and the creek's flow will not be adversely affected. The road will be 24 feet wide with an all-weather surface, shoulders and a drainage system (the overall width will be 40 feet). Providing a direct intertie to the Pastoria Substation, the applicant proposes to build a 1.3 mile 230 kV transmission line. Although the transmission line crosses Pastoria Creek, the applicant does not expect to impact the creek in any way building this linear facility. According to the applicant, towers to support the line will be built on either side of the creek and the line strung to span the creek without disturbing it (average span is 650 feet) (PEF 1999a).

Both the natural gas pipeline and the water supply lines will be buried requiring trenching and approximately 4 feet of cover (p. 3.7-1). Operational widths for the pipeline right-of-way (ROW) will be 25 feet (PEF/Thompson 2000a Draft Erosion Control and Stormwater Management Plan, Table 1). Pipeline construction will include ROW clearing, trenching, shoring, bedding, laying down of pipes, backfilling, compaction and revegetation. The 11.65 mile natural gas pipeline will be 16 to 20 inches in diameter and connect to the 42-inch Kern-River Mojave high pressure backbone pipeline (owned by Kern River Gas Transmission Company and Mojave Pipeline Company) (PEF 1999a, Section 3.7). Along its route, the preferred natural gas pipeline (Route 3) crosses 14 creeks and drainages as it travels along mostly existing dirt farm and fire roads and an underground aqueduct line, the majority of which are on the Tejon Ranch property. As currently proposed the 24-inch water supply route crosses Pastoria Creek prior to interconnecting with the WRMWSD 24-inch supply line north of the plant site.

Where these linear facility routes traverse creeks and drainages, the Applicant proposes to bury the pipelines well below the scour depths and ensure adequate cover (PEF 2000a, WTR 10b, WTR 13). To further lower the level of impact to these waterways, the applicant proposes to construct the pipelines during the summer months when the creeks and drainages are dry or have their lowest flow rates. Where water is present, temporary diversion structures will be built with the creek restored after the pipeline is installed (PEF 2000a, WTR 10b).

Portions of the natural gas pipeline route traverse steep terrain. Particular care will need to be taken to ensure that temporary and permanent structures prevent erosion and sedimentation and that vegetation is restored in a timely manner. The applicant is proposing to use water bars and other (not yet specified) drainage facilities along these steep slopes to reduce erosion (PEF 2000a, WTR 10c).

The access road will be covered with asphalt (PEF 1999a, p. 3.5-4). Existing and new rights-of-way (ROW) will provide access to the transmission line route. The new ROWs will be cleared and maintained (PEF 1999a, p.3.8-8&9, see note 3.8-20).

SOIL & WATER RESOURCES Table 3
Estimated Land Disturbance*

Project Component	Construction (acres)	Operation (acres)
Generating Plant (includes 25 acre temporary construction laydown area)	55	30
T- Line (Rte 1)	23	0.1**
NG Pipeline (Rte 3)	71	--
Water Supply Line (Rte 4)	1.4	--
Access Road (Rte 5)	8	4
Total	158.4	36.1

*Personal communications between staff and consultants to the applicant indicate these numbers may not be current, however, no official update has been provided.
**Route 1 impacts are related to transmission tower structures.
Source: Draft Erosion Control and Stormwater Management Plan, Table 1, March 2000.

During project operation, wind and water action can continue to erode unprotected surfaces. An increase in the amount of impervious surfaces can increase runoff, leading to the erosion of unprotected surfaces. Approximately half of the site will be covered with impervious surfaces and the remaining area within the fence line will be revegetated or covered with gravelly surfaces. The applicant will be required to comply with the provisions of the General NPDES permits for both construction and operation of the PEF, which include requirements for the development and implementation of a Stormwater Pollution Prevention Plan. Enron has developed draft Storm Water Pollution Prevention Plans for both construction and operation as well as a draft Erosion Control and Stormwater Management Plan (PEF/Thompson 2000a; PEF Thompson 2000f, S&W Data Response #1). For purposes of expediting the development of the PEF, the applicant requests that the plans for the construction and operation phases of the project be developed separately. Staff finds this acceptable.

STORMWATER DISCHARGE

A system of above ground and underground drainage and collection structures will be used to collect on-site stormwater from approximately 50 acres (30-acre project site and 20-acre off-site area between the berms and the project site). Ditches, culverts, catch basins and maintenance holes will convey stormwater to unlined stormwater detention basins/ponds located in the northwestern boundary and the eastern side of the plant site between the cooling towers. Overflow from the detention basins will drain to an existing swale at the northwest corner of the plant site and follow a drainage path to Pastoria Creek (PEF/Thompson 2000f, Attachment 12).

The Applicant has submitted draft stormwater pollution prevention plans for both construction and operation phases (PEF/Thompson 2000a; PEF/Thompson 2000f, Attachment 12). As proposed, underground pipes will be sized to carry a 10-year storm event and buildings will be constructed to remain above the 100-year storm event. The detention basins will be sized to contain the first half-inch of rainfall from the 50-acre drainage area and retain the water for approximately 40 hours. The specific storm event that will be used to determine the net volume of water that must be contained was not provided in the draft plans and at this time, the exact dimensions of the basins have not been determined. The adequacy of these stormwater management measures will be discussed in the Final Staff Assessment.

Construction of the stormwater discharge structures to Pastoria Creek, which may be considered, under the Clean Water Act, as a Waters of the United States, may require a Nationwide Permit from the U.S. Army Corp of Engineers and a 401 certification from the RWQCB. The Applicant is preparing materials necessary for these permits and approvals. In addition, a Streambed Alteration Agreement will be required from the California Department of Fish and Game to mitigate for impacts to the creeks and drainages from the construction of the underground linear facilities. These permits and their requirements are discussed in more detail in the **Biological Resources** chapter of this PSA and will be discussed further in the FSA.

WATER SUPPLY

As proposed, the PEF will require an annual average of 2,443 gpm (3,940 acre-feet a year) of water and a summer maximum of 4,351 gpm (7,017 acre-feet a year) (PEF/Thompson 2000f, Revised Table 3.4.8-1; PEF/Thompson 2000h). Water will be used for several processes at PEF, including boiler feedwater for the HRSG, cooling water for the towers, evaporative cooling in the combustion turbines inlet air, utility water for washdown, potable water (after treatment) for personnel and other miscellaneous uses on site (PEF 1999a, p. 3.4-14). Appendix A of this chapter shows the water balance and uses of water at the PEF.

Most of the water used by PEF will be for cooling purposes. Water used in the cooling towers will undergo 10 cycles of concentration and use of a zero liquid discharge waste water processing system will allow for water recovery and re-use (PEF 2000a: PEF/Thompson 2000f, Data Response WTR3, Revised Table 3.4.8-1).

On May 16, 2000, the applicant submitted a revised Water Supply Plan that differs from the original proposal outlined in the AFC (PEF/Thompson 2000p). Four major types of transactions constitute the general approach to the water supply for PEF, including 1) industrial water service from WRMWSD from turnback pool water, 2) backup water supplies provided by Azurix through exchanges of groundwater for SWP water, 3) one-time purchases or exchanges via water transfers both in and out of Kern County, and 4) possibly through option agreements with agricultural water users. In the latter case, temporary fallowing of agricultural lands may result. This current proposal differs from the AFC in that back-up water will no longer be supplied by WRMWSD from their stored underground supplies, but rather will be obtained through arrangements made by the water management company, Azurix.

In their description of the water supply plan, the Applicant assumes that the water from WRMWSD turnback pool will be available 60-70 percent of the time. When water is not available from WRMWSD, PEF will obtain water supplies from Azurix. PEF, LLC also assumes that WRMWSD can make the unused portion of its California Aqueduct capacity available for conveyance of water to PEF obtained by Azurix through exchanges of its groundwater options for SWP water (PEF/Thompson 2000p; 2000q).

In their letter to Winston Cheng of Enron on May 16, 2000, WRMWSD stated that the delivery and statistical analysis performed by Enron to determine the availability of turnback pool water overstated availability of the excess water by 30 to 40 percent. According to WRMWSD, the district can currently expect full water supply from the SWP in about 50 percent of all the years. In future years as demand for State Water Project water increases, firm water deliveries will diminish resulting in less water being made available to PEF. In addition, WRMWSD clarified that although they can guarantee capacity in their own distribution system for the conveyance of back-up water to PEF, they can not guarantee conveyance capacity for PEF in the SWP's Aqueduct. At this time, staff has not received evidence that PEF can obtain firm conveyance capacity in the Aqueduct for delivery of exchange water to WRMWSD turnout facilities. (WRMWSD/Taube 2000a)

BACK-UP WATER SUPPLIES

In the Water Supply Plan, the applicant stated that Azurix would provide the applicant with 1) back-up water supplies, 2) firm water delivery guarantees, and 3) water management services. As proposed, Azurix will purchase options on groundwater held in Kern County Water Agency (KCWA) territory to make surface water transfers for SWP water. When these transfers are complete, the water would be delivered to the project via the Aqueduct (using excess WRMWSD's capacity) and then through the WRMWSD's distribution system (PEF/Thompson 2000_). At this time, Azurix is still negotiating for the options for water rights and the ability to convey water in the State Water Project to the PEF. WRMWSD, at the March 14, 2000 staff workshop, confirmed that adequate capacity exists in the 24-inch line north of the project to serve PEF. The District has also indicated their willingness to convey water to PEF obtained by Azurix with any facilities within their system. Permits and approvals may be required prior to execution of the water exchanges proposed by Azurix of groundwater supplies for Aqueduct supplies. At

this time, staff has not received evidence of the ability of Azurix to obtain these approvals within the timeline for delivery of water to the project given by the applicant. Any possible impacts to groundwater or aqueduct water quality as a result of pumping groundwater to the aqueduct have not yet been identified.

Staff has discussed this proposal with WRMWSD to confirm if the assumptions and assertions in the proposal are accurate. According to Bill Taube of WRMWSD, the proposal over-estimates the percentage of time the turnback pool or surplus water will be available to the District for PEF. District records indicate that these supplies will be available only 50 to 60 percent of the time, resulting in the PEF being dependent on the back-up supplies a significant period of time. In addition, Mr. Taube explained that the District has little or no available excess conveyance capacity in the State Water Project for the applicant to purchase (ROC, 5/25/00). In the event that such capacity does exist, WRMWSD does not control it, but rather the capacity in the Aqueduct is controlled by the SWP.

Staff has requested more information on the water resources being pursued by Azurix (CEC 2000c). The applicant indicated that negotiations with potential sources of banked groundwater are continuing and that additional information will be provided about the time that this PSA is to be published (Sam Wehn ROC, 6/29/00). Information that staff seeks includes identification of the owners of the banked water, verification of the banking activity, information on any environmental review done on the banking and eventual recovery of the water, any agreements with entities that own and operate wells that would be used for the extraction of the groundwater and any permits or approvals that were obtained related to the banked water.

In the event that these banked water supplies have not undergone environmental review to determine potential impacts associated with the banking and recovery of the water resources, this evaluation will be required. Any exchange agreements normally need to be approved by KCWA. It is staff's position that in order to consider Azurix a legitimate water supplier to the PEF, all permits, approvals, environmental reviews and appropriate recovery and monitoring plans must be obtained prior to issuance of the Final Staff Assessment.

Staff is continuing to investigate this water supply proposal and its adequacy to provide reliable back-up water supplies to the PEF. Staff will continue to review this proposal and investigate its consequences. Results of this analysis will be discussed further in the Final Staff Assessment.

ON-SITE TREATMENT

Raw water from the California Aqueduct will be supplied to meet the project water needs. This supply will need to be treated for the power plant's various processes. Prior to use in the cooling towers the water will require clarification and/or filtration and chemical treatment to address possible scaling, corrosion and biofouling of the system. Treatment chemicals that will be addded to the water include sulfuric acid, organic phosphates and sodium hypochlorite (PEF 1999a, p. 3.4-14).

Raw Aqueduct water will be treated by an on-site certified treatment packaged unit to produce potable water supplies for use at the power plant. As noted above, Kern County Department of Environmental Health normally is responsible for approving any on-site treatment facilities that serve more than 25 persons (not just employees, but also any other visitors to the sites) for more than 60 days out of the year (Frye, ROC). Twenty-five full time, on-site employees will be needed to operate PEF and thus this treatment unit would normally require approval from Kern County. Staff recommends that the applicant be required to obtain approval from Kern County for this treatment unit.

The CTG evaporative coolers need water with low concentrations of dissolved solids and no chlorine. Potable water produced on-site will be treated to remove chlorine for use in the coolers. Demineralized water, produced through clarification, filtration, reverse osmosis and ion exchange, will be needed for HRSG boiler feedwater make-up. If required, raw water will be treated with biocides prior to demineralization. Solid waste from the clarifier filter press will be shipped off-site to an approved disposal site. If the condensate from the zero liquid discharge system meets the high quality requirements of the feedwater make-up, the demineralization system may be eliminated (PEF 2000a, Data Response WTR1). For a complete list of treatment chemicals and their anticipated volumes need for use at PEF, please see Table 3.4.10-1 of the AFC (PEF 1999a, p. 3.4-43).

(For a discussion of hazardous materials to be used at the PEF, please see the **Hazardous Materials Management** chapter of this PSA).

CONSTRUCTION WATER NEEDS

During construction, needed potable water will be delivered to the site, not generated on-site. Water will also be needed for dust control, washdown, concrete mixing, compaction processes and other such activities. WRMWSD has agreed to supply an average of 5,000 gpd and up to 20,000 gpd during the hydrotest period for the facility (PEF 2000a, WTR 7, p. WTR 10, 1/4/00).

POSSIBLE IMPACTS TO OTHER USERS/SYSTEM/SOURCES

WRMWSD's customer base is mostly agricultural with the district supplying approximately 200,000 acre-feet a year of water. As described above, the district receives allocations from the State Water Project, has developed and maintains banked groundwater, can purchase additional water from the Kern County Water Authority and other sources. According to Mr. Taube, since the project will be purchasing only District pool water (excess water from other customers), the District does not expect the project to adversely impact its customers (PEF 2000a, WTR 9, p. WTR 12). Staff agrees. Staff, however, is not able to make an assessment of the potential impacts to other customers or systems associated with back-up water supplies until additional information is obtained.

COOLING SYSTEM OPTIONS

A technically feasible alternative, dry and hybrid (wet/dry) cooling systems are occasionally used because they use significantly less water (greater than 90 percent less) and reduce the occurrence of visible plumes as compared to conventional wet

systems. Dry and hybrid cooling systems are, however, less efficient in rejecting heat, and generally have higher parasitic (fan) electrical loads and can create a higher pressure (temperature) in the steam turbine condenser (Burns 1995). Both of these factors decrease the thermal efficiency and power output of the plant. In addition, capital costs of dry cooling towers, including ancillary systems, may cost two to four times that of a wet cooling tower.

Appendix B provides the applicant's cost and performance comparisons between various cooling options (PEF/Thompson 2000h). Of particular note is that the water use comparisons between the wet and wet/dry cooling options chosen by the Applicant show no difference in water consumption. This is due to the low percentage of cooling done by the dry portion of system (only 4 percent) that is designed for plume abatement during the winter when the plume would be visible. From a water conservation standpoint, the wet and wet/dry systems compared by the applicant as essentially the same. Other systems that employ dry cooling for a larger percentage of the cooling requirements will result in less water use.

Estimates provided by the Applicant are consistent with the range of estimates seen in other cases that the Energy Commission has reviewed, albeit PEF, LLC's estimates appear to be on the higher end of the range. These capital cost estimates do not include the costs associated with the construction of the pipeline. Nor do these estimates reflect costs associated with option contracts pursued by Azurix to secure a back-up water supply or costs associated with water purchase, extraction and conveyance. Estimates for per kilowatt adjustments for performance deficit are based on the maximum performance losses and the need to augment the size of the PEF to make up for efficiency losses.

Issues related to cost and performance differences between cooling systems have been overcome in other cases where problems or concerns regarding water supply or wastewater discharge exist. Dry cooling is to be used at the recently certified Sutter Power Project (97-AFC-2), representing a 95 percent reduction in water demand. Also, dry cooling is currently being proposed for the Otay Mesa Generating Project (99-AFC-5). In light of the poorly defined water supply for PEF, staff is continuing to evaluate alternatives that may result in less water use at PEF. These alternatives will be discussed further in the Final Staff Assessment.

WASTEWATER DISCHARGE

Originally, the applicant proposed to use existing and new oil wells in the Tejon Oil Field located approximately 1.5 miles to the northwest of the plant site to dispose of the PEF's wastewater (PEF 1999a, p. 3.1-3, 5.3-2). Soils & Water Resources Table 4 shows what the applicant expected the quality of this wastewater to be (PEF 1999a, Table 3.4.8-5) after 10 cycles of concentration for the cooling towers and 5 cycles of concentration for the evaporative cooler blowdown. As of the January 2000 Supplement to the AFC, the applicant identified a zero liquid waste discharge system as the preferred system for PEF and at the March 2000 staff workshop, eliminated the deep well alternative from their proposal.

Wastewater from plant drains, washdown areas and sample drains will be collected and routed to the oil-water separator. Clear water from this system will be sent to the zero discharge system for recovery while the oil residue will be disposed of off-site at an approved facility (PEF 1999a, p. 3.4-20). Backwash from the demineralized system will be routed to the cooling tower. Other water to be routed to the cooling towers include blowdown from the combustion turbine inlet coolers and the steam condensate system (PEF 1999a, p. 3.11-11).

Sanitary waste will be discharged to a septic system consisting of an underground septic tank and leaching field (PEF 1999a, 3.1-3). It is estimated that 1,400 gpd of sanitary waste will be generated at the site. Sludge and solids will periodically be removed and disposed of to a sanitary waste facility (PEF 1999a, Table 3.4.9-2).

SOILS & WATER RESOURCES TABLE 4
PEF Waste Water Quality

Constituents	Discharge Concentration
Cations (total as CaCO3)	mg/L
Calcium	138.2
Magnesium	71.1
Sodium	278.6
Potassium	0.0
Iron	0.1
Manganese	0.0
Ammonia	0.0
Anions (total as CaCO3)	mg/L
Sulfate	245.1
Chloride	318
Fluoride	1.1
Bromide	0.8
Nitrate + Nitrite	4.3
Phosphate (total)	1.0
M Alkalinity	534.1
P Alkalinity	23.5
Metals	mg/L
Aluminum	0.0
Barium	0.0
Boron	1.1
Selenium	0.0
Other	
Silica (as SiO2)	84.0 mg/L
TSS	6.8 ppm
BOD	NT ppm

Source: Pastoria Energy Facility, LLC. 1999a, Table 3.4.8-5.
* Data is based on peak operation (1,145 gpm disharge), 10 cycles of concentration for the cooling tower blowdown, 5 cycles of concentration for the evaporative cooler blowdown, and WRMWSD groundwater resources (updated information that reflects Aqueduct water concentrations is required).

ZERO LIQUID DISCHARGE TREATMENT AND RECOVER SYSTEM

As proposed, the current preferred disposal method is zero liquid discharge (ZD) of wastewater. All wastewater, except sanitary and stormwater streams, will be directed to the ZD system (PEF 2000a, Attachment 11). The process that will be employed at PEF will physically and chemically separate dissolved and suspended solids from the wastewater resulting in recoverable water and a potentially saleable salt cake byproduct (PEF 1999a, p.3.1-3). Recovered water from the ZD system will be recycled back into the plant's water system, thus lowering overall water

consumption by 5-10 percent compared to a project without the ZD process (PEF 1999a, p.3.4-18; PEF/Thompson 2000f, Adaption of Table 3.4.8-1 for Cooling Water Comparison).

The ZD system will employ a filtration, evaporator/condenser and brine crystalizer (PEF 1999a, p. 3.4-18). Wastewater streams will be directed to a holding tank (2 million gallons). Wastewater, at 2,000-2,500 ppm TDS, will flow to the evaporator-condenser where approximately 98 percent of the water will be recovered as condensate. PEF's evaporator-condensor will require approximately 1.8 MW at 400 gpm condensate. A highly concentrated brine product (10,000 ppm TDS) will go from the evaporator-condensor to a storage tank with a capacity of 50,000 gallons. A brine crystalizer will recover approximately 1 percent of the wastewater influent (half the brine) as clean condensate. The salt cake will be discharged with a moisture content of 10-15 percent. Approximately 2 to 8 cubic yards of recovered solids are expected (an average of 5 cubic yards). During peak summer operations up to 7 truck trips a week will be needed for removing the product offsite. The resulting salt cake will either be sold or disposed of at an approved landfill. The resulting salt cake is not expected to be hazardous (PEF 1999a, p.3.4-19; PEF 2000a, Attachment 11). For more discussion of the handling of the project's waste streams, please see the **Waste Management** section of this PSA.

CUMULATIVE IMPACTS

Temporary and permanent disturbance associated with construction of the proposed project will cause accelerated wind and water induced erosion. Implementation of the proposed mitigation measures should ensure that the proposed project would not contribute to cumulative erosion and sedimentation impacts. Wastewater streams have been minimized by the use of the ZD system and a septic system. No wastewater-related cumulative impacts are expected.

Staff is continuing to evaluate the potential impacts that may be associated with the water supply proposal for PEF. Cumulative impacts associated with the water supply will be discussed in the Final Staff Assessment.

FACILITY CLOSURE

A planned, unexpected temporary or permanent closure of the proposed PEF should not be a significant concern if the site drainage and erosion are properly dealt with for any potential closure.

Unexpected permanent closure may pose the potential for drainage and erosion problems due to a lack of maintenance of the facilities. Staff will require PEF to address this concern in their closure plan.

COMPLIANCE WITH LORS

Staff has determined that the project will likely comply with erosion control and water quality objectives. Additional clarification of the proposed project's water supply, any potential impacts associated with the water exchanges and conveyance

of the water to the PEF and information on the specific mitigation measures that may be required is required. Without this information, Energy Commission staff can not determine if this proposal will comply with applicable LORS. For discussion of the project's compliance with the Streambed Alteration Agreement and the Nationwide Permit, please see the **Biological Resources** section of this PSA.

SWRCB POLICY 75-58

SWRCB Policy 75-58 states that the source of power plant cooling water should come from the following sources in order of priority:

1. Wastewater being discharged to the ocean.
2. Ocean water.
3. Brackish water from natural sources or irrigation returns flow.
4. Inland wastewaters of low total dissolved solids.
5. Other inland waters.

Clearly, the first two sources listed are not reasonable options for the proposed project; nor does irrigation return flows represent a reliable or sufficient water source. Wastewater treatment effluent is also not available. Produced water which is a brackish, natural water pumped up with oil is a potential water source that could be used for project cooling, but is not available in sufficient quantities from the Tejon Oil Field to be considered viable.

The policy states that, where the SWRCB has jurisdiction, use of fresh inland waters for power plant cooling will be approved only when it is demonstrated that the use of other water sources or other methods of cooling are environmentally undesirable or economically unsound. The SWRCB policy also calls for water availability studies for projects to be constructed in the Central Valley to consider potential impacts on Delta outflow and water quality objectives. Since PEF proposes to use excess water supplies from allocations already approved for WRMWSD or already banked in the south San Joaquin Valley, additional studies are not required.

DRY AND WET/DRY COOLING

SWRCB Policy 75-58 also states that "…studies associated with power plants should include an analysis of the cost and water use associated with the use of alternative cooling facilities employing dry, or wet/dry modes of operation."

Cooling towers reject heat from a power plant's steam cycle to condense the steam exiting the steam turbine and to maintain the lowest possible condenser vacuum. The heat rejection mechanism in wet cooling towers is primarily the evaporation of water to the atmosphere. Dry cooling towers transfer heat convectively through heat exchangers, while wet/dry hybrid cooling towers use combinations of the two mechanisms to reject heat to the atmosphere.

Cooling towers use forced or induced draft to move ambient air through the tower. The ambient air temperature, humidity, velocity, and mass flow rate affect the heat transfer rate and, ultimately, the efficiency of the cooling tower. The cooling tower heat rejection efficiency and pump and fan loading affect the overall power plant thermal efficiency and output.

The fundamental differences between wet, wet/dry hybrid, and dry cooling towers are initial capital costs and heat rejection effectiveness. Dry cooling towers are two to three times more expensive than a wet system. Hybrid systems fall in the range between the two, depending upon the ratio of "wet to dry" cooling in the hybrid design. In general, the cost differences are due to the dry condenser, or heat exchanger, and taller and larger structures for dry and hybrid cooling systems.

Despite the significant cost differences, dry and hybrid cooling systems are occasionally employed because they use less water and reduce the occurrence of visible plumes compared to wet systems. For the Sutter Power Project (97-AFC-2), a combined cycle project, the switch from conventional wet cooling towers to dry cooling represented a 95 percent reduction in project water demand. For wet/dry hybrid systems, the reduction in water use is dependent upon the percentage of dry versus wet.

A comparison of dry, hybrid, and wet cooling towers ultimately depends on the specific needs of the proposed application. Dry and hybrid-cooling systems provide benefits in the areas of water use and plume visibility, but with some performance degradation and additional costs. Additionally, dry and hybrid cooling can be noisier, use additional fuel, or be a more visually obtrusive structure.

At this time, staff is awaiting guidance from the State Water Resources Control Board regarding application of SWRCB Policy 75-58 to power projects currently being proposed. Use of dry cooling or wet/dry cooling technology is technologically feasible and would reduce water demand but would have significant additional capital and operation and maintenance costs. A wet/dry cooling system would still require a significant water supply at least a portion of the year and would therefore include the additional economic and environmental costs of such a supply. Staff is continuing to evaluate project compliance with this policy and will provide additional discussion in the Final Staff Assessment.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

In the AFC, the Applicant identified several mitigation measures for the proposed PEF. Additional mitigation measures and conditions were proposed in the March 2000 submittal (PEF/Thompson 2000a, Applicant's proposed SOIL&WATER 1 - 4). Staff has reviewed these measures and appreciates the efforts of the applicant to incorporate these measures into their proposal. Staff's recommended conditions of certification below take these proposed mitigation measures and conditions into consideration.

EROSION AND SEDIMENT CONTROL

In PEF, LLC's draft compliance plans and response to staff's Soils & Water-1 data request, the applicant provided drafts of the Construction Storm Water Pollution Prevention Plan and Erosion Control and Storm Water Management Plan, and the Operational Storm Water Pollution Prevention Plan (PEF/Thompson 2000a; 2000f, S&W Data Response #1). At this time, these plans do not reflect any of the specific measures that may be required in the Nationwide Permits or the Streambed Alteration Agreement, but generally discuss methods that may be employed to limit erosion and protect water quality. Appendix C provides examples of best management practices (BMPs) that may be used to control storm water-related pollution and minimize erosion. Because construction of the PEF and its linear facilities will impact 13 stream crossings, the applicant expects that the following will be required:

- All construction within the streambeds will occur during the dry season.
- All construction trenches will be re-seeded and appropriate monitoring will be conducted to ensure minimization of erosion.
- Stream flows will be diverted around construction areas using structures like coffer dams and temporary piping. All streams will be returned to their original state after construction.

When finalized, the stormwater pollution prevention plans will satisfy requirements as required under the General Construction Stormwater Permit issued by the State Water Resources Control Board.

Wind erosion of disturbed areas will be controlled by such techniques as wetting of surfaces, use of dust retardant chemicals, coverings (tarps), and hydro-seeding of areas where work is complete (PEF 2000a).

SPILL PREVENTION

A site spill contingency plan will need to be developed for chemical spill control and management of the hazardous materials that will be stored and used on the site (please see the **Hazardous Materials Management** section of this PSA for more information). As generally described, PEF, LLLC proposes to curb or dike hazardous material storage areas to contain any leaks or spills (PEF 1999a, p. 4-3). The containment structure will be sized to hold the volume in the largest tank or container plus the volume of rainfall from a 25-year, 24-hour storm event. Corrosion resistant coatings may be used if deemed needed (PEF 1999a). Areas in which more than one vessel is to be located will be designed to contain 150 percent of the volume from the largest tank. At this time, the site-specific spill prevention and contingency plan has not yet been submitted for staff review.

SITE DRAINAGE

The site drainage system will be designed to comply with all applicable federal, state, and local regulations. On-site drainage will be accomplished by gravity flow, whenever possible. The surface drainage system will consist of terracing, mild slopes and open, vegetated channels. PEF, LLC proposes to use grading contours

whenever possible. The surface drainage system will consist of terracing, mild slopes and open, vegetated channels. PEF, LLC proposes to use grading contours and berms to control both stormwater drainage and proper channeling of runoff flows (PEF 1999a). To provide added protection against stormwater flows, the berms will be broad, approximately 3 feet high with varying slopes to blend in with the natural topography. Native vegetation will be used to cover these berms. The underground drainage system will be sized to accommodate a 10-year storm event. Ultimately designed to provide protection against a 100-year storm, surface water flows will be directed away from buildings and equipment (PEF/Thompson 2000e). Stormwater will be directed to unlined detention ponds designed to contain the first half-inch of rainfall from the drainage area and result in retention of the water for approximately 40 hours allowing solids to settle and oils to surface. Oils will be collected and disposed of at an approved site. Design of the site drainage facilities will be performed in accordance with the Kern County Hydrology Manual, design standards and Federal Emergency Management Agency requirements (PEF/Thompson 2000e).

An oil/water separator located in a vault with inlets sized for the first half-inch of rain will be used to process drainage from parking areas and equipment locations. Oils will be removed using such tools as absorption pillows that can be collected and sent off-site for disposal (PEF 1999a).

SANITARY WASTES

The sanitary waste system will consist of a septic tank and leaching field. The design will conform to the Kern County regulations and Uniform Plumbing Code. The total quantity of flow used in sizing will be calculated based on the total equivalent fixture units provided. The maximum anticipated amount of discharge to the septic system is 5 gpm (PEF/Thompson 2000h).

CEC STAFF PROPOSED MITIGATION

Energy Commission staff finds PEF, LLC's proposed mitigation measures for erosion and stormwater control to be adequate to ensure the project does not contribute to project specific or cumulative impacts.

Conditions of certification are proposed to insure that mitigation measures are properly implemented. For example, proposed conditions of certification require the project owner to provide copies of the erosion control and stormwater pollution prevention plans required by state and local regulations. In addition, recommended conditions require the project owner to file notices of intent for the General Construction Stormwater Permit. Staff is providing general conditions of certifications below that are intended to initiate discussion on the outstanding information, requirements and issues. Additional and or refined Conditions for Certification will be identified in the Final Staff Assessment.

CONCLUSIONS AND RECOMMENDATIONS

Staff is not able to recommend approval of the proposed PEF for the technical area of Soil & Water Resources at this time. Based on information submitted by the

applicant to date, staff concludes that the Applicant has not yet secured a reliable water supply. In the event that Azurix is able to obtain adequate options for banked water supplies, staff will need to verify the legitimacy of these programs, including recovery plans and monitoring agreements. If appropriate environmental reviews have not yet been completed on these programs, additional time may be required to allow this review to be done. It is possible that additional permits and approvals may be required depending on the status of the banking programs being pursued by Azurix and the water exchanges envisioned. In the event the applicant submits additional information to the Commission in a timely manner, staff will review it and incorporate it into the Final Staff Assessment as appropriate. Staff will also continue to work with appropriate agencies to evaluate compliance of the project's proposed water supply with LORS.

CONDITIONS OF CERTIFICATION

SOILS&WATER 1: Prior to beginning any clearing, grading or excavation activities associated with construction of any project element, the project owner shall obtain Energy Commission staff approval for a Storm Water Pollution Prevention Plan (SWPPP) as required under the General Stormwater Construction Activity Permit for the project.

Verification: Thirty days prior to the start of any clearing, grading or excavation activities associated with the construction of any project element, the project owner will submit a copy of the Storm Water Pollution Prevention Plan (SWPPP) to the Energy Commission Compliance Project Manager (CPM) for review and approval. Verification of approval by the Kern County Engineering and Survey Services Department/Floodplain for the disposal of site drainage water will be included with the SWPPP. Approval of the plan by the Energy Commission CPM must be received prior to the initiation of any clearing, grading or excavation activities associated with construction of any project element.

SOILS&WATER 2: Prior to beginning any clearing, grading or excavation activities associated with construction of any project element, the project owner shall obtain staff approval for a final erosion control and revegetation plan that addresses all project elements. The final plan to be submitted for staff's approval shall contain all the elements of the draft plan with changes made to address any staff comments and the final design of the project.

Verification: The erosion control and revegetation plan shall be submitted to the Energy Commission CPM no later than thirty days prior to the start of any clearing, grading, or excavation activities. Approval of the final plan by the Energy Commission CPM must be received prior to the initiation of any clearing, grading or excavation activities associated with construction of any project element.

SOIL&WATER 3: Prior to commercial operation, the project owner, as required under the General Industrial Activity Storm Water Permit, will develop and implement a Storm Water Pollution Prevention Plan (SWPPP). Approval for the final General Industrial Activities SWPPP must be obtained from Energy Commission CPM in consultation with Energy Commission water resources staff prior to commercial operation of the power plant.

Verification: No later than sixty days prior to the start of commercial operation, the project owner will submit to the Energy Commission CPM a copy of the Storm Water Pollution Prevention Plan (SWPPP) prepared under requirements of the General Industrial Activity Storm Water Permit. The final plan shall contain all the elements of the draft plan with changes made to address staff comments and the final design of the project.

SOIL&WATER 4: Prior to commercial operation, the project owner will prepare detailed engineering drawings for the on-site domestic water treatment facility and submit these drawings with a detailed description to the Kern County Environmental Health Department. Approval for the on-site domestic water treatment facility will be obtained from the Kern County Environmental Health Department and verification of this approval provided to Energy Commission staff prior to commercial operation of the power plant.

Verification: No later than sixty days prior to the start of commercial operation, the project owner will submit to the Energy Commission CPM a copy of the engineering drawings and the approval by the Kern County Environmental Health Department for the on-site domestic water treatment facility to be used at PEF.

REFERENCES

Azurix. 2000a. Azurix homepage located at: http:www.azurix.com Accessed June 2000.

Azurix 2000b. Azurix letter to Honorable Board of Directors, Rosedale/Rio Bravo Water District regarding Option to Purchase/Exchange Banked Water. June 14, 2000.

Business Week. 2000. “Paddling as Fast as She Can”, Stephanie Anderson Forest, May 1, 2000, p. 91.

CEC (California Energy Commission/Lewis). 2000b. Pastoria Energy Facility – First Set of Data Requests (Numbers 1 to 44). Submitted to CEC on March 3, 2000.

CEC (California Energy Commission/Lewis). 2000c. Pastoria Energy Facility – Second Set of Data Requests. Submitted to CEC on May 31, 2000.

Kern County Development Standards, Resource Management Agency, August 1995.

Kern County Hydrology Manual, Department of Planning and Development Services, 1995.

PEF (Pastoria Energy Facility). 1999a. Application for Certification, Volumes I and II, Pastoria Energy Facility Project (AFC-99-7). Submitted to the California Energy Commission on November 30, 1999.

PEF (Pastoria Energy Facility/Ray). 1999d. Transmittal of Phase I Environmental Site Assessment. Prepared for the PEF Application for Certification (AFC-99-7). Submitted to the California Energy Commission on December 16, 1999.

PEF (Pastoria Energy Facility). 2000a. Response to CEC Data Adequacy Comments Dated December 29, 1999 (Supplement to AFC-99-7). Submitted to the California Energy Commission on January 5, 2000.

PEF (Pastoria Energy Facility). 2000b Appendix L – Preliminary Geotechnical Investigation Report dated January 5, 2000 (Vol. II of Application of Certification). Submitted to the California Energy Commission on January 7, 2000.

PEF (Pastoria Energy Facility/Parquet). 2000a. Project Description Clarification for the Pastoria Energy Facility. Submitted to CEC/Rhoads on March 1, 2000.

PEF (Pastoria Energy Facility/Thompson). 2000a. Recommended Mitigation Measures and Draft Compliance Plans/Outlines. Submitted to CEC on March 6, 2000.

PEF (Pastoria Energy Facility/Thompson). 2000f. Applicant's Data Request Responses. Submitted to the California Energy Commission on April 3, 2000.

PEF (PEF/Thompson). 2000h. Applicant's Data Request Responses. Submitted to the California Energy Commission on April 7, 2000.

PEF (Pastoria Energy Facility/Thompson). 2000j. Responses to California Energy Commission Data Requests Modified Response to Data Request Soil and Water. Submitted to the California Energy Commission on April 19, 2000.

Wall Street Journal. 2000. "Azurix Teams Up with Cotton King in Water Venture", Rebecca Smith, April 11, 2000, p. B4.

WRMWSD (WRMWSD/Taube). 2000a. Letter from William Taube to Winton Cheng regarding Pastoria Energy Facility Water Supply Plan dated May 16, 2000.

APPENDIX A: WATER BALANCE

APPENDIX B: COOLING OPTION COMPARISONS

APPENDIX C: BEST MANAGEMENT PRACTICES

Erosion Control and Stormwater Management Plans identifies temporary and permanent erosion and stormwater control measures. When finalized, these plans serve as the stormwater pollution prevention plan as required under the General Construction Stormwater Permit issued by the State Water Resources Control Board.

Plans identify a number of potential best management practices for the construction and operation phases of the project that may be employed at the site and along linear facilities.

BEST MANAGEMENT PRACTICES THAT REDUCE EROSION AND SEDIMENT-LADEN STORMWATER RUNOFF

- Cover disturbed soils with mulch. This may be used in combination with temporary or permanent seeding strategies.
- Direct runoff away from disturbed areas by means of temporary drainage ways.
- Stabilize plant site roadways with compaction or gravel.
- Utilize soil stabilizers (most commonly water) on disturbed areas as appropriate and as required in Air Quality conditions.
- Utilize straw bale barriers to intercept sediment-laden runoff from small areas of disturbed soil.
- Create straw check dams to reduce erosion of existing drainage channels and to promote sedimentation behind the dam.
- Place silt fencing to promote sedimentation behind silt fence.
- Create stormwater retention basins to retain runoff and allow excessive sediment to settle out.
- Inspect temporary erosion control devices during construction in accordance with the Final Plan schedule.
- Insure replacement of damaged or missing structures.
- Notify project construction crew when to implement adequate precautions in anticipation of poor weather conditions.
- Dictate appropriate wetness when watering a road for dust suppression.
- Develop remedial erosion controls for problem areas, if any.
- Complying with applicable codes.
- Protect stockpiled soil with water-resistant tarps; protect stockpiles from runoff with hay bales or silt fencing, or surpress dust with water.

- Install temporary slope breakers (water bars or berms) at the portion of the pipeline that crosses grades steep enough to require such measures in order to divert water off the construction right-of-way and to reduce velocities.
- Slope breakers will be installed at spacing recommended by the Bureau of Land Management or Natural Resources Conservation Service.
- Slope breakers may be constructed from soil, silt fences, or stalked hay or straw bales.
- Straw bale barriers and/or check dams will be inspected and replaced or repaired as needed. Accumulated sediment will be removed when it reaches a depth of 6 inches.
- Sandbags placed along the toes of slopes and at linear facility structures will be inspected. Sediment will be removed after each significant storm event and deposited in a stable area not subject to erosion.
- If sediment accumulates over 1 foot behind the (sandbag) barrier, the contractor will remove or regrade the sediment.
- Mulched areas will be examined for damage or deterioration and reapplied as necessary.
- Protected storage areas for stockpiled soils or other materials will be inspected. Tarps or other coverings will be replaced and secured.
- Depending on the season, slope breakers will be inspected in areas of active equipment or within 24 hours of each 0.5-inch of rainfall.
- Slope breakers will be maintained until revegetation measures are successful or the area is stabilized.

BEST MANAGEMENT PRACTICES TO PREVENT STORMWATER CONTAMINATION

- Provide secondary containment for hazardous material delivery and storage areas to prevent spills or leakage of fluid materials from contaminating soil or soaking into the ground.
- Cover dumpsters and waste containers.
- Designate storage areas for construction wastes.
- Provide for proper storage of hazardous materials, paints, and related products.
- Train employees on the proper use of materials such as fuel, oil, asphalt and concrete compounds, acids, glues, solvents, etc.
- Implement a spill prevention and control plan.
- Timely remove construction wastes.
- Store all liquid wastes in covered containers.
- Use portable toilet facilities managed by licensed contractor.

GEOLOGY AND PALEONTOLOGY

Robert Anderson

INTRODUCTION

The geology and paleontology section discusses the project's potential impacts regarding geological hazards, geological and paleontological resources, and surface water hydrology. The purpose of the geology analysis is to verify that the applicable laws, ordinances, regulations, and standards (LORS) have been identified and that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to significant geological and paleontological resources, and surface water hydrology during project construction, operation and closure. The section concludes with the staff's proposed monitoring and mitigation measures with respect to geological hazards, geological and paleontological resources, and surface water hydrology, with the inclusion of nine conditions of certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The applicable LORS are listed in the AFC, in Sections 5.3, 5.5, and 5.8 (Pastoria 1999a). A brief description of the LORS for paleontological resources, geological hazards and resources, and surface water hydrology follows:

FEDERAL

There are no federal LORS for geological hazards and resources, or grading and erosion control. The Pastoria Energy Facility (PEF) is not located on lands owned by the United States Government.

STATE AND LOCAL

The California Building Code (CBC) 1998 edition is based upon the Uniform Building Code (UBC), 1997 edition, which was published by the International Conference of Building Officials. The CBC is a series of standards that are used in 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.

The California Environmental Quality Act (CEQA) Guidelines Appendix G provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.

Sections (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geological hazards.

Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

The Standard Procedures, Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources (SVP 1994) are a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. They were adopted in October 1994 by a national organization of vertebrate paleontologists (the Society of Vertebrate Paleontologists).

SETTING

The PEF is proposed to be a 750 megawatt combined cycle natural gas-fired power plant. A 1.38 mile long 230 kilovolt (kV) electric transmission line will run from the power plant switchyard to the Southern California Edison Pastoria Substation near the site. An 11.65 mile long natural gas supply line (route 3) is proposed to run from the existing Kern River Gas Transmission Company and Mojave Pipeline Company natural gas transmission line northeast of the project to the proposed power plant. The site will receive water from a tie-in to the California Aqueduct.

The proposed power plant is located in the mouth of Pastoria Canyon which is located in an area of the southern margin of the San Joaquin Valley, known as the Tejon Embayment. The site is mantled in a dense fanglomerate and alluvium. No landslides were observed at or adjacent to the proposed power plant's footprint.

The alluvium is Pleistocene in age and is made up of silty sands and gravels and drains well. The fanglomerate is made up of dense sands, gravels, and cobbles. This is locally restricted to areas of the alluvial fan that have experienced high water discharge rates in the past.

The Vaqueros Formation is Oligocene to Miocene in age. The formation contains marine sediments made up of massive sandstones and conglomerates and is considered to be highly sensitive since it is known to contain vertebrate fossils outside of the project area in a subunit called the Teyuca Beds.

The Santa Margarita Formation is Miocene in age, and is made up of marine sands and nonmarine sands and gravels. Both terrestrial and marine vertebrate fossils have been reported in this unit.

The Kananc Formation is a Miocene age continental and marine formation in the Tejon Hills. The unit is made up of poorly sorted and poorly bedded detritus from the nearby mountains, claystone, and rhyolite. Terrestrial vertebrate fossils have been reported in this unit.

No permanent surface water bodies are located on or adjacent to the power plant footprint. However, there is an ephemeral stream drainage (Pastoria Creek) located approximately 1,000 feet west of the power plant footprint. The existing grade of

the power plant footprint is shallow (4 percent). The proposed 30-acre site varies in elevation from a low of 1058 feet above mean sea level to a high of 1088 feet above mean sea level.

ANALYSIS AND IMPACTS

GEOLOGICAL HAZARDS

FAULTING AND SEISMICITY

Energy Commission staff reviewed the California Division of Mines and Geology publication "Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions," dated 1994 (CDMG 1994) and aerial photos of the proposed power plant footprint (DWR 1990). Energy Commission staff visited the proposed power plant location on February 17, 2000, and did not observe any surface faulting at the proposed power plant site on the ground or in aerial photos. No active faults are known to cross the proposed power plant footprint or the possible reconductoring corridor from the power plant to the Pastoria Substation. The project is located within seismic zone 4 as delineated on Figure 16-2 of the 1998 edition of the California Building Code. The closest known active fault is the Pleito fault (a thrust fault) which is located 1 kilometer (km) south of the proposed power plant. The Pleito fault dips to the south near the footprint of the power plant. The proposed power plant is located on the hanging wall side of the Pleito fault. The estimated peak horizontal ground acceleration for the power plant is 0.52g based upon a moment magnitude 7 earthquake on the Pleito fault. The potential of surface rupture on a fault at the power plant footprint is considered to be very low, since no faults are known to have ruptured the ground surface of the proposed power plant location. The Southern California Edison Pastoria Substation is located approximately 2 km (1.25 miles) south of the PEF and on the hanging wall side of the projection of the Pleito fault. This substation is the tie-in for the proposed 230kV transmission line from the project's switchyard.

The proposed 230 kV electric transmission line designated as route 1 in the AFC crosses the projected trace of the Pleito fault. The proposed natural gas pipeline crosses the Springs fault (route 3) at milepost 6.75. The Springs fault is not currently zoned as an earthquake hazard zone under the Alquist-Priolo Earthquake Hazard Zone mapping program. The applicant has indicated that the fault may have experienced displacement during the 1952 Bakersfield earthquake, but this is not confirmed. The Springs fault is not considered to be capable of generating a large (magnitude 7 or greater) earthquake since it is fairly short in length; the mapped exposure is less than 15 kilometers (PEF 1999a).

The White Wolf fault is located approximately 16 kilometers north of the proposed power plant footprint. In July 1952 a magnitude 7.5 earthquake occurred on this fault to the east of the proposed power plant. Staff did not see any surface evidence of soil failures that may be attributed to strong ground shaking from the Bakersfield earthquake. In June 1988 a local magnitude 5.2 earthquake occurred 53 kilometers (33 miles) south southeast of Bakersfield. The fault on which the

earthquake occurred was not determined. The Edmonston Pumping Plant is located 1.2 kilometers (0.75 miles) from the proposed power plant site. The level of strong ground shaking from the earthquake was estimated at the plant to be 0.08g (Schiff 1989). Even though this level of strong ground shaking was low, some equipment damage and ground cracking of the access road leading to the Edmonston Pumping Plant occurred.

LIQUEFACTION, HYDROCOMPACTION, SUBSIDENCE, AND EXPANSIVE SOILS

Liquefaction is a condition in which a cohesionless soil may lose shear strength due to a sudden increase in pore water pressure. One of the parameters used to assess the potential for liquefaction is the depth to ground water at the site under study. Generally the depth to ground water at a site should be less than 100 feet for liquefaction to be possible. The depth to groundwater beneath the site is estimated to be in excess of 100 feet below existing grade based on soil boring logs for the project. Because the alluvium under the site is dense and the depth to ground water is in excess of 100 feet below existing grade, the potential for liquefaction at the power plant site is considered to be negligible.

Hydrocompaction is the process of the loss of soil volume upon the application of water. The soils at the site are dense enough that hydrocompaction is not considered to be a significant problem at the power plant location. The applicant reported in the AFC that the State of California Department of Water Resources (DWR) encountered soils prone to hydrocompaction during the construction of the California Aqueduct, in the southern portion of the San Joaquin Valley. In order to mitigate potentially collapsible soils, DWR flooded portions of the aqueduct alignment in order to induce collapse of the soils so that the aqueduct could be built on pre-collapsed ground. The applicant is aware of the potential of collapsing soils and has indicated that they will assess the power plant footprint and linear facilities with respect to collapsing soils prior to developing the final design of the project. Since the project site alluvium is dense and the applicant is not proposing to pump ground water, staff have determined that there is no significant potential for subsidence due to ground water withdrawal or dynamic compaction at the proposed power plant footprint.

Soils that contain a high percentage of expansive clay minerals are prone to expansion, if subjected to an increase in water content. Expansive soils are usually measured with an index test such as the expansive index potential. In order for a soil to be a candidate for testing, the soil must have a high clay content and the clay must have a high shrink-swell potential and a high plasticity index. Two soil units are reported to occur within the footprint of the proposed power plant, the Hesperia sandy loam and the Psamments-Xerolls complex. Both the Hesperia sandy loam Psamments-Xerolls complex are considered to have a low shrink-swell potential (PEF 1999a). A description of the Hesperia sandy loam and the Psamments-Xerolls complex soils can be found in the **Soils and Water Resources** section of this staff assessment.

LANDSLIDES

No landslides were observed on or adjacent to the proposed power plant footprint during a staff site visit on February 17, 2000. Landsliding potential at the proposed power plant site is considered to be low, since the proposed power plant is located on a broad, gently sloping (4 percent to the northwest) alluvial fan.

GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

No geological resources have been identified at the power plant location, the natural gas supply line route, or the water supply line route. Mineralogical resources in the vicinity of the project include sand, gravel, oil and gas. There is an active sand and gravel quarry northeast of the power plant footprint. The site is located near the Tejon oil field. Energy Commission staff's review of California Department of Conservation, Division of Mines and Geology Special Report 147 (CDMG 1988) indicates that the proposed power plant site and linear facilities location are designated by the California Department of Conservation, Division of Mines and Geology as MRZ-2 (areas with known mineral resources (aggregate)) and MRZ-3 (areas containing mineral deposits the significance of which can not be evaluated from the available data). The power plant site and the southern portions of the linear facilities are located in MRZ-2. The area where the new electric transmission corridor crosses mineralogical resource zones are not considered to have a significant impact since the transmission line towers are already in place.

Regarding paleontological resources, Energy Commission staff has reviewed the paleontological resources assessments, Appendix K to the AFC (Pastoria 1999a). Geology at the power plant footprint location is made up of quaternary alluvium, the Santa Margarita Formation, the Chanac Formation, and the Vaqueros Formation. No in-situ paleontological resources were reported by the applicant's consultant during their field surveys from July 27 to August 8, 1999. The applicant has indicated that the alluvium has been reported to yield vertebrate fossils. The lack of fossils in alluvium near the project and the age of the alluvium (Pleistocene) indicates that the alluvium has a high sensitivity and a low potential with respect to paleontological resources. The Santa Margarita Formation is Miocene in age, and is made up of marine sands and nonmarine sands and gravels. The unit is known to have yielded both marine and terrestrial vertebrate fossils near the project site. The close proximity of the paleontological resources location to the project marks this formation with a high sensitivity and high potential with respect to paleontological resources. The Vaqueros Formation is Oligocene to Miocene in age. The formation contains marine sediments made up of massive sandstones and conglomerates and is considered to be highly sensitive, since it is known to contain vertebrate fossils outside of the project area in a subunit called the Teyuca Beds. The applicant has identified the Vaqueros Formation as highly sensitive, but the potential for encountering significant paleontological resources is considered to be low with the exception of the Teyuca Beds unit. The Teyuca Beds unit is not anticipated to be encountered during construction of the project. The last formation is the Chanac Formation, which is a Miocene age continental and marine formation in the Tejon Hills. The unit is made up of poorly sorted and poorly bedded detritus from the nearby mountains, claystone, and rhyolite. Terrestrial vertebrate fossils have been recovered from this unit. The fossils include remains of horses,

antelope, pig, elephant, and camel (Pastoria 1999a pp. 5.8-9). This unit is assigned a high sensitivity and a low potential with respect to paleontological resources. No fossils were observed by Energy Commission staff at the power plant during a site visit on February 17, 2000. No significant paleontological resources were reported found by the applicant's paleontologist during field surveys of the proposed power plant site and linear facilities. Staff have proposed conditions of certification that will enable the applicant to mitigate impacts upon paleontological resources to a less than significant level should they be encountered during construction, operation, and closure of the project.

SURFACE WATER HYDROLOGY

The power plant footprint is not located in a 100 year flood zone as it is located in zone "A," an area of minimal flooding as depicted on the Federal Emergency Management Agency Flood Insurance Rate Map sheet no. 060075-1750 B, panel 1750. Minimum grade for the power plant area will be 1 percent and all drainage will be directed away from buildings within the footprint. A storm water retention pond is proposed to be constructed on site. A portion of the on-site drainage is to be captured in the ephemeral stream channel on site and discharged off site to the south. The 100-year 24-hour storm event precipitation amount is 2.5 inches (NOAA 1973). A drainage diversion berm will be constructed between the Pastoria Creek drainage and the powerplant footprint to prevent localized flooding of the site due to a release of water from the California Aqueduct south of the site. This diversion berm will also help prevent flooding of the power plant during the 100-year 24-hour storm event. Run-off during a 100-year 24-hour storm event should not overwhelm the capacity of the proposed surface water drainage system.

SITE SPECIFIC IMPACTS

Minor excavations, drilling, clearing and brushing operations, and grading of alluvium and/or fanglomerate at the power plant site associated with construction of the project are considered to be a minor potential impact to paleontological resources. However, as of the time that this document was prepared the site was not known to have any fossils located on it. The adoption and implementation of the proposed conditions of certifications for paleontological resources should mitigate any potential impacts to paleontological resources associated with the construction of this project.

The site is located adjacent to an area of known geological resources: sand and gravel and oil and gas. No major surface water bodies are located at the proposed power plant site. Crossing of local drainages by proposed linear facilities are proposed to present a minimum impact on surface water resources. Storm water run-off is proposed to be managed through the proposed power plant's drainage control plan and by complying with the proposed conditions of certification for the **Soils and Water Resources** section of this document. None of the geological hazards identified by the applicant or by Energy Commission staff are considered to be significantly impacted by the construction and operation of the proposed project. In conclusion, the project is not likely to have any significant impact on geological or paleontological resources, surface water resources, or geological hazards.

CUMULATIVE IMPACTS

It is staff's opinion that the potential for a significant adverse cumulative impact on paleontological resources, geological resources, or surface water hydrology is unlikely, if the PEF is constructed according to the proposed conditions of certification. This opinion is based on the fact that the site is not known to have significant paleontological or geological resources.

FACILITY CLOSURE

A definition and general approach to closure is presented in the General Conditions section of this document. Facility closure activities are not anticipated to impact geological or paleontological resources. This is due to the fact that no paleontological or geological resources are known to exist at the power plant location. In addition, decommissioning and closure of the power plant should not negatively affect geological or paleontological resources since the majority of the ground disturbed in plant decommissioning and closure would have been disturbed in the construction of the plant. Surface water hydrology impacts will depend upon the closure activities proposed.

MITIGATION

Based upon the literature and archives search, field surveys and the preliminary geotechnical investigation for the project, the applicant has proposed monitoring and mitigation measures to be followed during the construction of the power plant, related natural gas supply line, electrical transmission line, and the waste water pipelines. Energy Commission staff agree with the applicant that there is a low probability that vertebrate fossils will be encountered during construction of the power plant and related features.

The proposed conditions of certification are to allow the Energy Commission Compliance Project Manager (CPM) and the applicant to adopt a compliance monitoring scheme that will ensure compliance with LORS applicable to geological hazards, geological and paleontological resources, and surface water hydrology for the project.

CONCLUSION AND RECOMMENDATIONS

The applicant will likely be able to comply with applicable LORS. The project should have no adverse impact with respect to geological and paleontological resources and surface water hydrology. Staff proposes to ensure compliance with applicable LORS for geological hazards, geological and paleontological resources and surface water hydrology with the adoption of the proposed conditions of certification listed below, and the conditions of certification for surface water hydrology which are located in the **Soils and Water Resources** section of this document.

PROPOSED CONDITIONS OF CERTIFICATION

GEO-1 Prior to the start of any project-related construction activities (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall assign to the project an engineering geologist(s), certified by the State of California, to carry out the duties required by the 1998 edition of the California Building Code (CBC) Appendix Chapter 33, Section 3309.4. The certified engineering geologist(s) assigned must be approved by the Compliance Project Manager (CPM). The functions of the engineering geologist can be performed by the responsible geotechnical engineer, if that person has the appropriate California license.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the Chief Building Official (CBO)) prior to the start of construction, the project owner shall submit to the CPM for approval the name(s) and license number(s) of the certified engineering geologist(s) assigned to the project. The submittal should include a statement that CPM approval is needed. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of its findings within 15 days of receipt of the submittal. If the engineering geologist(s) is subsequently replaced, the project owner shall submit for approval the name(s) and license number(s) of the newly assigned individual(s) to the CPM. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of the findings within 15 days of receipt of the notice of personnel change.

GEO-2 The assigned engineering geologist(s) shall carry out the duties required by the 1998 CBC, Appendix Chapter 33, Section 3309.4 Engineered Grading Requirement, and Section 3318.1 – Final Reports. Those duties are:

1. Prepare the Engineering Geology Report. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit.

2. Monitor geologic conditions during construction.

3. Prepare the Final Engineering Geology Report.

Protocol: The Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3309.3 Grading Designation, shall include an adequate description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and an opinion on the adequacy of the site for the intended use as affected by geologic factors.

The Final Engineering Geology Report to be completed after completion of grading, as required by the 1998 CBC Appendix Chapter 33, Section 3318.1, shall contain the following: A final description of the geology of the site and any new information disclosed during grading; and the effect of same on recommendations incorporated

in the approved grading plan. The engineering geologist shall submit a statement that, to the best of his or her knowledge, the work within their area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of this chapter.

Verification: (1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations contained in the report are incorporated into the plans and specifications. (2) Within 90 days following completion of the final grading, the project owner shall submit copies of the Final Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3318 Completion of Work, to the CBO, and to the CPM on request.

PAL-1 Prior to the start of any project-related construction activities (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall ensure that the designated paleontological resource specialist approved by the CPM is available for field activities and prepared to implement the conditions of certification.

The designated paleontological resources specialist shall be responsible for implementing all the paleontological conditions of certification and for using qualified personnel to assist in this work.

Protocol: The project owner shall provide the CPM with the name and statement of qualifications for the designated paleontological resource specialist.

The statement of qualifications for the designated paleontological resources specialist shall demonstrate that the specialist meets the following minimum qualifications: a degree in paleontology or geology or paleontological resource management; and at least three years of paleontological resource mitigation and field experience in California, including at least one year's experience leading paleontological resource mitigation and field activities.

The statement of qualifications shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

If the CPM determines that the qualifications of the proposed paleontological resource specialist do not satisfy the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

If the approved, designated paleontological resource specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM

approval of the new designated paleontological resource specialist by submitting the name and qualifications of the proposed replacement to the CPM, at least ten (10) days prior to the termination or release of the preceding designated paleontological resource specialist.

Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

Verification: At least ninety (90) days prior to the start of construction, the project owner shall submit the name and resume and the availability for its designated paleontological resource specialist, to the CPM for review and approval. The CPM shall provide written approval or disapproval of the proposed paleontological resource specialist.

At least ten (10) days prior to the termination or release of a designated paleontological resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated paleontological resource specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

PAL-2 Prior to the start of any project-related construction activities (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the designated paleontological resource specialist shall prepare a Paleontological Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontological resources, and submit this plan to the CPM for review and approval. After CPM approval, the project owner's designated paleontological resource specialist shall be available to implement the Monitoring and Mitigation Plan, as needed, throughout project construction.

In addition to the project owner's adoption of the guidelines of the Society of Vertebrate Paleontologists (SVP 1994) the Paleontological Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:

- A discussion of the sequence of project-related tasks, such as any pre-construction surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation;

- Identification of the person(s) expected to assist with each of the tasks identified within this condition for certification, and a discussion of the mitigation

team leadership and organizational structure, and the inter-relationship of tasks and responsibilities;

- Where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur and a schedule for the monitoring;

- An explanation that the designated paleontological resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined;

- A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;

- Inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontological resources; and

- Identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work, discussion of any requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution.

Verification: At least sixty (60) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the Monitoring and Mitigation Plan prepared by the designated paleontological resource specialist for review and approval. If the plan is not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes.

PAL-3 Prior to the start of any project-related construction activities (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), and throughout the project construction period as needed for all new employees, the project owner and the designated paleontological resource specialist shall prepare and conduct CPM-approved training to all project managers, construction supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontological resources or deposits that may be discovered during project-related ground disturbance.

Protocol: The paleontological training program shall discuss the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall also include the set of reporting procedures that workers are to follow if paleontological resources are encountered during project activities. The training program shall be presented by the designated paleontological resource specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least (30) thirty days prior to the start of project construction, the project owner shall submit to the CPM for review, comment, and written approval, the proposed employee training program and the set of reporting procedures the workers are to follow if paleontological resources are encountered during project construction.

If the employee training program and set of procedures are not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes, before the beginning of construction.

Documentation for training of additional new employees shall be provided in subsequent Monthly Compliance Reports, as appropriate.

PAL-4 The designated paleontological resource specialist shall be present at all times he or she deems appropriate to monitor construction-related grading, excavation, trenching, and/or augering in areas where potentially fossil-bearing sediments have been identified. If the designated paleontological resource specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner.

Verification: The project owner shall include in the Monthly Compliance Reports a summary of paleontological activities conducted by the designated paleontological resource specialist.

PAL-5 The project owner, through the designated paleontological resource specialist, shall ensure recovery, preparation for analysis, analysis, identification and inventory, 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 its compliance files copies of signed contracts or agreements with the designated paleontological resource specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation for and delivery of all significant paleontological resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resources Report and shall keep these files available for periodic audit by the CPM.

PAL-6 The project owner shall ensure preparation of a Paleontological Resources Report by the designated paleontological resource specialist. The Paleontological Resources Report shall be completed following completion of the analysis of the recovered fossil materials and related information. The project owner shall submit the paleontological report to the CPM for approval.

Protocol: The report shall include (but not be limited to) a description and inventory list of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the paleontological resource specialist that project impacts to paleontological resources have been mitigated.

Verification: The project owner shall submit a copy of the Paleontological Resources Report to the CPM for review and approval under a cover letter stating that it is a confidential document. The report is to be prepared by the designated paleontological resource specialist within 90 days following completion of the analysis of the recovered fossil materials.

PAL-7 The project owner shall include in the facility closure plan a description regarding facility closure activity's potential to impact paleontological resources. The conditions for closure will be determined when a facility closure plan is submitted to the CPM twelve months prior to closure of the facility. If no activities are proposed that would potentially impact paleontological resources, then no mitigation measures for paleontological resource management are required in the facility closure plan.

Protocol: The closure requirements for paleontological resources are to be based upon the Paleontological Resources Report and the proposed grading activities for facility closure.

Verification: The project owner shall include a description of closure activities described above in the facility closure plan.

REFERENCES

CDMG (California Division of Mines and Geology). 1988. Mineral Land Classification: Aggregate Materials in the Bakersfield Production-Consumption Region, California Division of Mines and Geology Special Report 147, plate 15.

CDMG (California Division of Mines and Geology). 1992. (Fourth reprinting) Geologic Map of California, Bakersfield Sheet, Scale 1:250,000.

CDMG (California Division of Mines and Geology). 1994. Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions, Scale: 1:750,000.

DWR (California Department of Water Resources). 1990. Black and White Aerial Photos of the Edmonston Pumping Plant and Vicinity, Aerial photos flight designation WR-AXB nos. 1-1 through 1-3, dated June 2, 1990, scale 1:30,000

FEMA (Federal Emergency Management Agency). 1986. Flood Insurance Rate Map No. 060075-1750 B panel no. 1750, dated September 29, 1986.

NOAA (National Oceanic and Atmospheric Administration). 1973. Precipitation-Frequency Atlas of the Western United States, Volume XI-California, Figure 43.

Pastoria (Pastoria Energy Facility, LLC.). 1999a. Pastoria Energy Facility Application for Certification, submitted to the California Energy Commission, November 30, 1999.

Pastoria (Pastoria Energy Facility, LLC.). 1999X. Appendix K to the Pastoria Energy Facility Application for Certification, Paleontological Resources Technical Report, confidential filing, submitted to the California Energy Commission, November 30, 1999.

Schiff. A.J. 1989. Lifeline Response to the Tejon Ranch Earthquake, in Earthquake Spectra, Volume 5 No. 4. P. 791-811.

SVP (Society of Vertebrate Paleontologists). 1994. Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures. October 1994.

FACILITY DESIGN

Steve Baker, Al McCuen and Kisabuli

INTRODUCTION

Facility Design encompasses the civil, structural, mechanical and electrical engineering aspects of the project. The purpose of the Facility Design analysis is to verify that the laws, ordinances, regulations and standards (LORS) applicable to the design and construction of the project have been identified; and that the project and ancillary facilities have been described in sufficient detail, including design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety.

This analysis also examines 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, environmental protection or the operational reliability of the project. This analysis further identifies the design review and construction inspection process and establishes conditions of certification that will be used to ensure compliance with the intent of the 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 covered in this analysis include:

1. Identification of the LORS applicable to facility design;
2. Evaluation of the applicant’s proposed design criteria, including the identification of those criteria that are essential to ensuring protection of the environment and public health and safety;
3. Proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable LORS;
4. Identification of the Energy Commission’s design review and construction inspection process, which is used to ensure compliance with applicable LORS and protection of the environment and public health and safety; and
5. Conditions of certification proposed by staff to ensure that the project will be designed and constructed to comply with all applicable LORS, and protect environmental quality and assure public health and safety.

SETTING

The Pastoria Energy Facility, a Limited Liability Corporation (LLC), proposes to construct and operate the Pastoria Energy Facility (PEF). The project as proposed is a nominal 750 megawatt (MW), natural gas-fired, combined cycle, electric generation facility. The combined cycle configuration will consist of three 168 MW combustion turbine generators (CTGs), three heat recovery steam generators (HRSGs), one 185 MW steam turbine generator (STG) and one 90 MW STG.

The proposed PEF project site is about 30 miles south of Bakersfield, California, on the Tejon Ranch at the base of the Tehachapi Mountains. The site is six and one-half miles east of Interstate 5 at Grapevine. The site is located approximately 0.85 mile north of the California Aqueduct and about 0.75 miles north of the Edmonston Pumping Plant (California Department of Water Resources). For more information on the site and related project description, please see the **Project Description** section.

The site is approximately 30 acres in size and is located in Township 10 North, Range 18 West, San Bernardino Baseline and Meridian. The site is in seismic zone 4, the highest seismic shaking zone in the country. Additional engineering details of the proposed project are contained in the Application for Certification (AFC), in Appendices C through H (PEF 1999a).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The applicable LORS for each engineering discipline, civil, structural, mechanical and electrical, are included in the application as part of the engineering appendices, Appendices C through H, and summarized in Section 7, Table 7 (PEF 1999a). A summary of these LORS includes: Title 24, California Code of Regulations, which adopts the current edition of the California Building Code (CBC) as minimum legal building standards; the 1998 CBC for design of structures; American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code; and National Electrical Manufacturers Association (NEMA) standards.

ANALYSIS

The basis of this analysis is the applicant's proposed analysis methods, construction methods and list of LORS and design criteria set forth in the AFC. Applicable engineering sections include:

Section 1.4	Project Schedule
Section 1.5	Project Ownership
Section 3	Facility description and Location
Section 7	Compliance with Applicable Laws, Ordinances, Regulations and Standards (LORS)
Section 7.3	Project Siting and Construction

Appendices

1. Appendix C	Foundations and Civil Engineering Design Criteria
2. Appendix D	Structural and Seismic Engineering Design Criteria
3. Appendix E	Mechanical Engineering Design Criteria
4. Appendix F	Electrical Engineering Design Criteria
5. Appendix G	Control Systems Engineering Design Criteria
6. Appendix H	Chemical Engineering Design Criteria
7. Appendix L	Geotechnical Report

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 natural gas pipeline and electric transmission line. The applicant proposes to use accepted industry standards (see AFC Section 7 for a list of the applicable industry standards), design practices, and construction methods in preparing and developing the site. The applicant's proposed methods follow industry standard practices. Staff concludes that the project, including its linear facilities, will likely comply with all applicable site preparation LORS, and proposes conditions of certification included below 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, or that require a long lead time to repair or replace, or those used for the storage, containment, or handling of hazardous or toxic materials. Major structures and equipment are listed in the conditions of certification (**GEN-2** below).

The AFC contains a list of the civil, structural, mechanical and electrical design criteria that demonstrate the likelihood of compliance with applicable LORS, and which staff believes are essential to ensuring that the project is designed in a manner that protects the environment and public health and safety.

Proposed Modifications

The AFC (PEF 1999a, Section 7, and Appendices C and D) identifies LORS applicable to the project. The project should be designed and constructed to the 1998 edition of the CBC, and other applicable codes and standards in effect at the time design and construction of the project actually commence. In the event the design of PEF is submitted to the Chief Building Official (CBO)[1] 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.

[1]The CBO is the CEC's duly appointed representative, who may be the City or County Chief Building Official, or other appointed representative.

CBC Lateral Force Requirements

The procedures and limitations for the seismic design of structures by the 1998 CBC are determined considering seismic zoning, site characteristics, occupancy, structural configuration, structural system and height. Different design and analysis procedures are recognized in the 1998 CBC for determining seismic effects on structures. The dynamic lateral force procedure of Section 1631 is always acceptable for design. The static lateral force procedure of Section 1630 is allowed under certain conditions of regularity, occupancy and height as determined under Section 1629. Nonbuilding structures (such as cooling towers, tanks and heat recovery steam generators) are included in Section 1634. Most of the structures in powerplant projects are considered nonbuilding structures.

Static Lateral Force Procedure

In seismic Zones 3 and 4, the static lateral force procedure of Section 1630 may be used for the following:

1. Regular structures under 240 feet in height with lateral force resistance provided by systems, listed in Table 16-N, except where Section 1629.8.4, Item 4, applies. (Structures, regular or irregular, located on Soil Profile Type S_F, that has a period of vibration greater than 0.7 second require dynamic analysis.)

2. Irregular structures not more than five stories or 65 feet in height.

Dynamic Lateral Force Procedure

In seismic zones 3 and 4, the dynamic lateral force procedure of Section 1631 shall be used for all other structures, including the following:

1. Structures having a stiffness, weight or geometric vertical irregularity of Type 1, 2 or 3, as defined in Table 16-L, or structures having irregular features not described in Table 16-L or 16-M, except as permitted by Section 1630.4.2. (Where a combination of structural systems is included in the same structure, the structure can be analyzed as two independent structures for purposes of determining regularity.)

2. Structures over five stories or 65 feet, not having the same structural system throughout their height except as permitted by Section 1631.2. (An elastic design response spectrum constructed in accordance with Figure 16-3 of the 1998 CBC, using the values of C_a and C_v consistent with the specific site can be used.)

3. Structures, regular or irregular, located on Soil Profile Type S_F, that have a period greater than 0.7 seconds.

Rigid Structures Lateral Force Design

Rigid structures (those with a fundamental period of vibration less than 0.06 second) and their anchorage shall be designed using procedures consistent with

the requirements of Section 1634.3 and any other applicable provisions of Section 1634.

Tanks with Supported Bottoms

Flat bottom tanks or other tanks with supported bottoms founded at or below grade shall be designed consistent with Section 1634.4 and any other applicable provisions of Section 1634.

Other Nonbuilding Structures

Nonbuilding structures not covered by Sections 1634.3 and 1634.4 shall be designed consistent with the requirements of Section 1634.5 and any other applicable provisions of Section 1634.

Ensuring the Appropriate Lateral Force Procedure

In order to ensure that structures are analyzed using the appropriate lateral force procedure, staff has included Proposed Condition of Certification **STRUC-1** below, 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.

CIVIL/STRUCTURAL FEATURES

The applicant proposes, and staff concurs that small, lightly loaded structures, not subject to vibratory loading be supported on shallow footings or mat foundations on properly compacted fill or undisturbed native soils. Foundation depth should extend to at least 12 inches below lowest adjacent grade. If any portion of the foundation bears on bedrock, the entire foundation should be deepened to bear on bedrock. Large, heavily loaded structures, and structures subjected to vibratory loading, should be constructed on deepened foundations that bear on bedrock. Such foundations may include deepened footing or concrete reinforced pier and grade beams. The powerplant and related facilities shall be designed to meet the seismic requirements of the latest edition of the California Building Code.

MECHANICAL SYSTEMS

The major features of the 750 MW power plant are the two power trains with three natural gas fired, F-class combustion turbine generators (CTG), each 168 MW, operating in combined cycle mode. Two CTGs will be installed in a two-on-one configuration with one steam turbine generator (STG) at 185 and one CTG will be installed in a one-on-one configuration with one STG at 90 MW.

The heat from hot exhaust gas, which flows from each CTG through a heat recovery steam generator (HRSG), will be extracted to produce steam to power the STG. The PEF will use 24 cooling tower cells arranged in two tower banks. The cooling towers are expected to be standard, induced draft counter-flow type. The 64-foot towers will incorporate plume abatement coils and high efficiency drift eliminators.

Other features of the project include: water and wastewater treatment facilities; pressure vessels, piping systems and pumps; aqueous ammonia storage, handling and piping system; air compressors; fire protection systems; and heating,

ventilation, air conditioning (HVAC), potable water, plumbing and sanitary sewage systems.

Mechanical LORS and Design Criteria

The application (PEF 1999a, Appendix E) lists and describes the mechanical codes, standards and design criteria that will be employed in project design documents, procurement specifications and contracts. Design work will be performed in accordance with the appropriate LORS. This list indicates that the applicant is aware of the codes, standards, and design criteria appropriate for such a project. This approach will likely assure the project's mechanical systems are designed to the appropriate codes and standards. Staff has proposed conditions of certification (**MECH-1** through **MECH-4**, below) to monitor compliance with this requirement.

ELECTRICAL SYSTEMS

Major electrical features of the project other than transmission include generators, power control wiring, protective relaying, grounding system, cathodic protection system and site lighting (PEF 1999a, Appendix F).

Power and Control Wiring. In general, conductors will be insulated based on a normal maximum conductor temperature of 90ºC in 40ºC ambient air with a maximum emergency overload temperature of 130ºC and a short circuit temperature of 250ºC. In areas with higher ambient temperatures, larger conductors will be used or higher temperature rated insulation will be selected.

Protective Relaying. These relays protect equipment in the auxiliary power supply system, generator terminal systems, 230 kV system, 4.16 kV systems, turbine-generator system, and the electrical loads powered from these systems. The protective relaying scheme will be designed to remove or alarm any of the abnormal occurrences.

Classification of Hazardous Areas. Areas where flammable and combustible liquids, gases, and dusts are handled and stored will be classified for determining the minimum criteria for design and installation of electrical equipment to minimize the possibility of ignition. The criteria for determining the appropriate classification are specified in Article 500 of the National Electrical Code’s National Fire Protection Association/American National Standards Institute (NFPA/ANSI), Section C1.

Grounding. The station grounding system will be an interconnected network of bare copper conductors and copper clad ground rods. The system will be provided to protect plant personnel and equipment from hazard, which can occur during power system faults and lightning strikes. The station-grounding grid will be designed for adequate capacity to dissipate heat from ground current under the most severe conditions in areas of high ground fault current concentrations.

Site Lighting. The site lighting system will provide personnel with illumination for the performance of general yard tasks, safety, and plant security. Power used to supply outdoor roadway and area lighting will be 277 volts.

Freeze Protection. A freeze protection system will be provided for selected outdoor piping as required. Parallel circuit type heating cable will be utilized where possible.

Cathodic Protection System. Cathodic protection and other corrosion control measures for all plant structures, including the exterior surface of underground piping and bottoms of surface mounted steel tanks will be provided as required.

The AFC (PEF 1999a, Appendix F) lists and describes the electrical codes, standards and design criteria that will be employed in project design documents, procurement specifications and contracts. Design work will be performed in accordance with the appropriate LORS. This list indicates that the applicant is aware of the codes, standards, and design criteria appropriate for such a project. This approach will likely assure the project's electrical systems are designed to the appropriate codes and standards.

Staff concludes that the applicant can design the electrical systems in accordance with all LORS and in a manner which protects the environment and public health and safety by complying with the applicable LORS and electrical design criteria (PEF 1999a, Appendix F). Staff has proposed conditions of certification (**ELEC-1** and **ELEC-2**, below) to monitor this compliance.

ANCILLARY FACILITIES

1. A new 230 kilovolt (kV) switchyard will be constructed at the project site.
2. A new 1.38-mile long, double circuit, 230 kV overhead electric transmission line will connect the project to Southern California Edison's (SCE) electrical transmission system.
3. A new, 0.2 mile water supply pipeline from the existing Wheeler Ridge-Maricopa Water Storage District to the power plant site will be installed.
4. A new 11.65 mile, 16-20 inch diameter fuel gas line from the power plant site north to the interstate Mojave-Kern River pipeline will be built.
5. A new, 0.85 mile access road to provide access to the site from the Edmonston Pumping Plant Road will be constructed.

PROJECT QUALITY PROCEDURES

The AFC (PEF 1999a AFC § 3.8.1.2.1, 3.9.2.6.1, 4.3.5.1, 4.3.5.2) describes a Project Quality 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 powerplant. 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 designed, procured, fabricated and installed in accordance with LORS.

COMPLIANCE MONITORING

The Energy Commission's Design Review and Construction Inspection Process

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 delegate agents typically include the local building official and independent consultants hired to cover 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 has completed, or will complete, the following to ensure the design review and construction inspection process is consistent with the applicant's timing of the project:

1. Staff will meet with the local building department to discuss the Energy Commission's compliance process and the potential involvement of the local building official as delegate agent.

2. Staff will propose a memorandum of understanding (MOU) with Kern County outlining the roles and responsibilities of the County and its subcontractors as delegate agents appointed by the Energy Commission to ensure compliance with the CBC and facility design conditions of certification.

3. Staff will meet with the County and its subcontractor (if applicable) to discuss the details of the design review and construction inspection process, fees, types of submittals required of the process and timing of the review.

Staff has developed conditions of certification (see the section below, titled "Proposed Conditions of Certification") to ensure compliance with LORS and protection of the environment and public health and safety. Some of these conditions address the roles, responsibilities and qualifications of PEF'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 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 with construction activities, these conditions are written to require that no element of construction of permanent facilities, which is difficult to reverse, may proceed without prior approval of plans from 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 have 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

A facility closure was evaluated under three scenarios; Planned Closure, Unexpected Temporary Closure and Unexpected Permanent Closure.

Planned 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. 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 and Kern County for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of the following items:

1. Proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;

2. All applicable LORS, local/regional plans, and a discussion of the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;

3. The activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and

4. Decommissioning alternatives, other than complete site restoration.

Unexpected Temporary Closure

Under this scenario, it is expected that the facility is closed unexpectedly, on a short-term basis. Natural disasters, such as an earthquake or severe storm, can

cause an unexpected temporary closure of the facility. If damage to the facilities is too great, the temporary closure may become permanent.

If the facility is closed on a temporary basis, the applicant shall secure the site in order to protect public health and safety. If temporary closure becomes permanent, the applicant shall follow the "Planned Closure" procedures outlined in the Planned Closure.

Unexpected Permanent Closure

Under this scenario, the project owner closes the facility unexpectedly on a permanent basis. In this case, the project owner shall implement the closure procedures outlined above for "Planned Closure."

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. Staff has proposed a Condition of Certification (**GEN-9**) to ensure that these measures are included in the Facility Closure Plan.

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 AFC, and the project LORS and design criteria in the record. Staff concludes that the design, construction and eventual closure of the project are likely to comply with applicable LORS. If properly implemented, design criteria, including staff proposed modifications, will ensure that LORS are met during the project design and construction phases.
3. The conditions of certification proposed will ensure that the proposed facilities are designed, constructed, operated, and eventually closed in accordance with applicable LORS. This will occur through the use of design review, plan checking and field inspections, which are to be performed by the local CBO or other commission delegate agent. Staff will audit the CBO to ensure satisfactory performance.
4. The Energy Commission design review and construction inspection process will be in place for the project and will allow construction to start as scheduled if the project is certified. The process will provide the necessary reviews to ensure compliance with applicable facility design LORS and conditions of certification.
5. 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 required by **GEN-9**, prior to the commencement of decommissioning, that the decommissioning procedure is likely to result in satisfactory decommissioning performance.

RECOMMENDATIONS

If the Energy Commission certifies the project, staff recommends that:

1. The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to comply with applicable LORS, and also to protect environmental quality, and assure public health and safety;
2. The project should be designed and built to the 1998 CBC (or successor standard, if such is in effect); and
3. The CBO shall review the final designs, conduct plan checking and perform field inspections during construction, and staff 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)[2] and all other applicable 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 TSE-1, TSE-2 and TSE-3 in the **Transmission Engineering** Section of this document.

Protocol: In the event that the PEF is 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 (or a lesser number of days mutually agreed to by the project owner and the CBO) after receipt of the Certificate of Occupancy, the project owner shall submit to the California Energy Commission Compliance Project Manager (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 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

[2] The Sections, Chapters, Appendices and Tables, unless otherwise stated, refer to the Sections, Chapters, Appendices and Tables of the 1998 California Building Code (CBC).

List. The schedule shall contain a description of, and a list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major structures and equipment in **Table 1: Major Equipment List** below). To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Table 1: Major Equipment List

Equipment/System	Quantity Plant	Size/ Capacity*	Remarks
Combustion Turbine (CT) Generator	3	168 MW each	Dry Low NO_X combustion control
Steam Turbine (ST)	2	185/90 MW	Single shaft HPT, IPT and LPT (2x1 configuration and 1x1 configuration)
Generators	5		Included with CT and ST
CT Inlet Air Filter	3	3,600,000 lb/hr	
Inlet Air Cooling	3		Evaporative/Refrigeration/Fogging
Fuel Gas Filter - Separator	3	150,000 lb/hr	
Turbo expander	1	230,000 lb/hr	
Heat Recovery Steam Generator (HRSG)	3	550,000 lb/hr	HP, IP, LP with reheat
HRSG Stack	3		18'-0" dia.x213' high
Catalytica CO Emission Control	3		Achieve BACT/LAER
Catalytica NO_X Emission Control	3		Achieve BACT/LAER
Ammonia Injection Skid	3		Two blowers per HRSG-alternate
Aqueous Ammonia Storage Tank	3	20,000 gal	Double walled tanks – alternate, for NO_x control
HP/IP HRSG feedwater pumps	6	1,700 gpm	HP with interstage bleed
Make-up Water Clarifier	1	5,6000 gpm	Gravity flow
Make-up Water Storage Tank	1	2,300,000 gal	Includes firewater storage
Demineralized Water Pumps	3	170 gpm	
Demineralized Water Treatment Package	1	350 gpm	
Demineralized Water Storage Tank	1	150,000 gal	
Condensate Pumps	5	1300 gpm	1 spare per condenser
Circulating Water Pumps	6	60,000 gpm/ 30,000 gpm	2x1 Configuration/1x1 Configuration
Wet Cooling Tower Banks	2	1.100mm BTU/hr / 600 mm BTU/hr	2x1 Configuration/1x1 Configuration
Fire Water Pump Skid	1	3,000 gpm	
Auxiliary Cooling Water Pumps	3	750 gpm	
Plant Air Compressors & Dryers	2	750 cfm	
Step-up Transformers	4	18/20 kV	To electrical grid
Emergency Backup Standby Generator	1	66 kW	Natural Gas Fired

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

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 rough grading, the project owner

shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The project owner shall provide schedule updates in the Monthly Compliance Report.

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

Verification: The project owner shall make the required payments to the CBO at the time of submittal of the plans, design calculations, specifications, or soil reports. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable 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 TSE-1, TSE-2 and TSE-3 in the **Transmission Engineering** Section of this document.

Protocol: 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 to ensure compliance with LORS;
2. Ensure that construction of all the facilities conforms in every material respect to the applicable LORS, these Conditions of Certification, approved plans, and specifications;
3. Prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner or as required by conditions on the project;
4. Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;

5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications.

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

If the RE or 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 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 name, qualifications and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within 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 name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) 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 powerplant 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 TSE-1, TSE-2 and TSE-3 in the **Transmission 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, powerplant 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 engineers assigned to the project. [1998 CBC, Section 104.2, Powers and Duties of Building Official.]

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

Protocol: A: The civil engineer shall:

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

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

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

1. Review all the engineering geology reports, and prepare final soils grading report;
2. Prepare the soils engineering reports required by the 1998 CBC, Appendix Chapter 33, Section 3309.5 – Soils Engineering Report, and Section 3309.6 – Engineering Geology Report;
3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 1998 CBC, Appendix Chapter 33, section 3317, Grading Inspections;
4. Recommend field changes to the civil engineer and RE;
5. Review the geotechnical report, field exploration report, laboratory tests, and engineering analyses detailing the nature and extent of the site soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load; and
6. Prepare reports on foundation investigation to comply with the 1998 CBC, Chapter 18 section 1804, Foundation Investigations.

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

Protocol: C: The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;
2. Provide consultation to the RE during design and construction of the project;
3. Monitor construction progress to ensure compliance with LORS;
4. Evaluate and recommend necessary changes in design; and
5. Prepare and sign all major building plans, specifications and calculations.

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

Protocol: E: The electrical engineer shall:

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

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

Verification: At least 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.

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 TSE-1, TSE-2 and TSE-3 in the **Transmission Engineering** Section of this document.

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

Verification: The project owner shall submit monthly construction progress reports to the CBO and CPM. The project owner shall transmit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 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.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. When the work and the "as-built" and "as graded" plans conform to the approved final plans, the project owner shall notify the CPM regarding the CBO's final approval. The marked up "as-built" drawings for the construction of structural and architectural work shall be submitted to the CBO. Changes approved by the CBO shall be identified on the "as-built" drawings [1998 CBC, Section 108, Inspections.]

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans.

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

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

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

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

CIVIL-1 Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils report as required by the 1998 CBC, Appendix Chapter 33, Section 3309.5, Soils Engineering Report and Section 3309.6, Engineering Geology Report.

Verification: At least 15 days prior to the start of site grading, the project owner shall submit the documents described above to the CBO for review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The 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 five days, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within five days of the CBO's approval, the project owner shall provide to the CPM a copy of the CBO's approval to resume earthwork and construction in the affected areas.

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

Protocol: If, in the course of inspection, it is discovered that the work is not being done in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action, and send copies to the CBO and the CPM.

Verification: Within 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, the project owner shall submit to the CBO for review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for:

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

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

Protocol: The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications [1998 CBC, Section 108.4, Approval Required];
3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures at least 90 days (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 a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of construction, 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 nonconforming 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 LORS.

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

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);
2. Concrete pour sign-off sheets;
3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and
5. Reports covering other structure activities requiring special inspections shall be in accordance with the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section 1701.5, Type of Work (requiring special inspection), Section 1702, Structural Observation and Section 1703, Nondestructive Testing.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within 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. 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. Chapter 16, Table 16–K of the 1998 CBC requires use of the following seismic design criteria: $I = 1.25$, $I_p = 1.5$ and $I_w = 1.15$.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of installation of the tanks or vessels containing the above specified quantities of highly toxic or explosive substances that would be hazardous to the safety of the general public if released, the project owner shall submit to the CBO for review and approval, final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

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 Prior to the start of any increment of piping construction, the project owner shall submit, for CBO review and approval, the proposed final design drawings, specifications and calculations for each plant piping system (exclude domestic water, refrigeration systems, and small bore piping, i.e., piping and tubing with a diameter less than two and one-half inches). The submittal shall also include the applicable QA/QC procedures. The project owner shall design and install all piping, other than domestic water, refrigeration, and small bore piping to the applicable edition of the CBC.

Upon completion of construction of any piping system, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 106.3.2, Submittal documents, Section 108.3, Inspection Requests.]

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

1. The proposed final design plans, specifications and calculations conform with all of the piping requirements set forth in the Energy Commission's Decision; and
2. All of the other piping systems, except domestic water, refrigeration systems and small bore piping have been designed, fabricated and installed in accordance with all applicable ordinances, regulations, laws and industry standards, including, as applicable:
   - American National Standards Institute (ANSI) B31.1 (Power Piping Code);
   - ANSI B31.2 (Fuel Gas Piping Code);
   - ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
   - ANSI B31.8 (Gas Transmission and Distribution Piping Code); and
   - Specific City/County code.

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

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of piping construction, the project owner shall submit to the CBO for approval, with a copy of the transmittal letter to the CPM, the above listed documents for that increment of construction of piping systems, including a copy of the signed and stamped engineer's certification of conformance with the Energy Commission's Decision. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation [1998 CBC, Section 108.3 – Inspection Requests.]

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 a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for review and approval, final design plans, specifications and calculations, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

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

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

Protocol: The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the applicable edition of the CBC. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include 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 a lesser number of days mutually agreed to by the project owner and the CBO) 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 applicable edition of the CBC, with a copy of the transmittal letter to the CPM.

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

MECH-4 Prior to the start of each increment of plumbing construction, the project owner shall submit for CBO's approval the final design plans, specifications, calculations, and QA/QC procedures for all plumbing systems, potable water systems, drainage systems (including sanitary drain and waste), toilet rooms, building energy conservation systems, and temperature control and ventilation systems, including water and sewer connection permits issued by the local agency. Upon completion of any increment of construction, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 108.3, Inspection Requests, Section 108.4, Approval Required.]

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

1. Plumbing, potable water, all drainage systems, and toilet rooms in accordance with Title 24, California Code of Regulations, Division 5, Part 5 and the California Plumbing Code (or other relevant section(s) of the currently adopted California Plumbing Code and Title 24, California Code of Regulations); and
2. Building energy conservation systems and temperature control and ventilation systems in accordance with Title 24, California Code of Regulations, Division 5, Chapter 2-53, Part 2.

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

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 construction of any of the above systems, the project owner shall submit to the CBO the final design plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the next Monthly Compliance Report following completion of that increment of construction.

ELEC-1 For the 480 volts and higher systems, the project owner shall not begin any increment of electrical construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on 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 [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 TSE-1, TSE-2 and TSE-3 in the **Transmission Engineering** Section of this document.

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

- receipt or delay of major electrical equipment;
- testing or energization of major electrical equipment; and
- 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 electrical construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for electrical equipment and systems 480 volts and greater, 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.

ELEC-2 The project owner shall submit to the CBO the required number of copies of items A and B for review and approval and one copy of item C [CBC 1998, Section 106.3.2, Submittal documents.] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission Engineering** Section of this document.

Protocol: A. Final plant design plans to include:

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

Protocol: B. Final plant calculations to establish:

1. short-circuit ratings of plant equipment;
2. ampacity of feeder cables;
3. voltage drop in feeder cables;
4. system grounding requirements;
5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
6. system grounding requirements;
7. lighting energy calculations; and
8. other reasonable calculations as customarily required by the CBO.

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

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 electrical equipment installation, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations, for electrical equipment and systems 480 volts and greater enumerated above, including a copy of the signed and stamped statement from the responsible electrical engineer certifying compliance with the applicable LORS. The project owner shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

REFERENCES

CDC (DOGGR)/Marshall 2000b. Request for Participation in the Review of the Pastoria Energy Facility Application for Certification, Kern County. Submitted to the California Energy Commission on February 24, 2000.

CDWR (California Department of Water Resources/Ramirez) 2000a. Comments RE The Electrical Transmission System Impact Study. Submitted to the California Energy Commission on January 7, 2000.

CDWR (California Dept. of Water Resources/Ramirez) 2000b. Letter to CEC/Lewis from Henry Ramirez RE effects of the prospective interconnection of the Pastoria Energy Facility to Southern California Edison's Pastoria Substation. Submitted to the California Energy Commission on March 7, 2000.

PEF (Pastoria Energy Facility, LLC) 1999a. Application for Certification, Volumes I and II, Pastoria Energy Facility Project (AFC-99-7). Submitted to the California Energy Commission on November 30, 1999.

PEF (Pastoria Energy Facility, LLC) 2000a. Response to CEC Data Adequacy Comments; dated December 29, 1999 (Supplement to AFC-99-7). Submitted to the California Energy Commission on January 5, 2000.

PEF (Pastoria Energy Facility, LLC) 2000b. Appendix L – Preliminary Geotechnical Investigation Report dated January 5, 2000 (Vol. II of Application of Certification). Submitted to the California Energy Commission on January 7, 2000.

PEF (Pastoria Energy Facility, LLC) 2000c. Pastoria Energy Facility, LLC-Southern California Edison Company Transmission Owner Tariff Facilities Study Agreement. Submitted to the California Energy Commission on February 24, 2000.

PEF (Pastoria Energy Facility, LLC/Parquet) 2000a. Project Description Clarification for the Pastoria Energy Facility. Submitted to California Energy commission/Rhoads on March 1, 2000.

PEF (Pastoria Energy Facility, LLC/Thompson) 2000a. Recommended Mitigation Measures and Draft Compliance Plans/Outlines. Submitted to California Energy Commission on March 6, 2000.

PEF (Pastoria Energy Facility, LLC/Thompson) 2000o. Amendment 1 to Pastoria Energy Facility, LLC – Southern California Edison Company Transmission Owner Tariff Facilities Agreement; dated April 25, 2000.

POWER PLANT RELIABILITY

Steve Baker

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 the resulting project would likely not degrade the overall reliability of the electric system it serves.

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 Pastoria Energy Facility, LLC (PEF, LLC, the applicant) has predicted a level of reliability for the power plant (see below), staff believes the applicant 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 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.

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 newly restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the California Independent System Operator (Cal-ISO), a newly-formed entity that will work with the California Power Exchange (PX) to purchase, dispatch and sell electric power throughout the state. How Cal-ISO will ensure system reliability is only now 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 are being 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 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 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.

The applicant proposes to operate the 750 MW Pastoria Energy Facility (PEF) at baseload, selling energy on the market. In addition, the applicant proposes to provide load following and turndown (PEF, LLC 1999a, AFC §§ 1.1, 3.9.1, 3.9.2.1, 3.9.2.1.1) and black start capability (PEF, LLC 1999a, AFC § 3.4.6.3). The project is expected to operate at an overall availability of 95 percent or higher, at a capacity factor determined by market demand (PEF, LLC 1999a, AFC §§ 1.3.2, 3.4.1, 3.9.1, 3.9.2.1.1, 3.9.2.6).

ANALYSIS

A reliable power plant is one that is available when called upon to operate. Throughout its intended life, the PEF will be expected to perform reliably in baseload and load following duty. Power plant systems must be able to operate for extended periods (sometimes months on end) without shutting down for maintenance or repairs. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability, 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 PEF will not degrade electric 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).

QA/QC PROGRAM

The QA/QC program delineated by the applicant (PEF, LLC 1999a, AFC §§ 3.8.1.2.1, 3.9.2.6.1, 4.3.5.1, 4.3.5.2) describes a program typical of the power industry. Equipment and supplies will be purchased from qualified suppliers of proven capabilities in accordance with the QA plan. Suppliers' track records will be evaluated, including their financial condition, personnel capabilities, past performance, quality program and physical facilities. 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**.

XONON™ NOX CONTROL SYSTEM

The applicant proposes to control gas turbine NOx emissions with a proprietary process known as XONON™, which employs catalytic combustors in the gas turbine, obviating the need for post-combustion cleanup such as selective catalytic reduction (SCR) (PEF, LLC 1999a, AFC §§ 1.1, 3.4.4.3.1, 3.4.11.1, 3.11.3.2; PEF, LLC 2000a, pp. REL-1 through REL-4). A XONON™ system, developed by Catalytica Combustion Systems, has operated successfully at Silicon Valley Power's Gianera Station in Santa Clara, California, since June 1999, exhibiting reliability over 95 percent (PEF, LLC 2000a; GTW 1999).

This system, however, operates on a small, 1.5 MW Kawasaki M1A-13A gas turbine. To date, XONON™ has not been demonstrated in a machine of Frame 7 proportions, such as the gas turbines that will power the PEF. General Electric and Tokyo Electric Power are currently testing XONON™ in a Frame 9E test combustor, which is similar to a Frame 7 combustor (GTW 1999).This is still not a substantial demonstration of reliability, and brings into question whether the PEF, utilizing gas turbines equipped with XONON™, would actually exhibit adequate reliability.

These reservations are moot, however, for the applicant has proposed to employ dry low-NOx combustors and SCR in the PEF if XONON™ proves unusable due to schedule or air quality considerations (PEF, LLC 1999a, AFC §§ 3.4.1, 3.4.4, 3.4.4.3.2, 3.4.11.5). Dry low-NOx combustors and SCR are well proven technologies; offering them as a backup to XONON™ allays any of staff's concerns regarding the potential reliability of XONON™.

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.

The applicant plans to provide appropriate redundancy of function for the combined cycle portion of the project (PEF, LLC 1999a, AFC §§ 3.4.6, 3.9.2.5, 3.9.2.6.1, 4.3.2.1, 4.3.2.2, 4.3.2.3; Table 4.3-1). The fact that the project consists of three trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other trains 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. Gas turbine and steam turbine auxiliaries (control systems, lube oil and lube oil cooling systems) will be typically redundant. Balance of plant equipment will be provided with redundant examples, thus:

- two 100 percent condensate pumps and two 100 percent boiler feed pumps per HRSG;
- three 50 percent circulating water pumps per cooling tower;
- two 50 percent auxiliary cooling water circulating pumps;
- three 50 percent demineralized water makeup 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

The applicant proposes to establish a plant maintenance program typical of the industry (PEF, LLC 1999a, AFC §§ 3.9.2.1.2, 3.9.2.6.1, 3.9.2.6.2, 4.1.2, 4.3.1.1, 4.3.1.4). The program will be carried out in accordance with documented procedures, by personnel trained under a documented training program. An inventory of selected spare parts will be maintained on site. Maintenance outages will be planned for periods of low electricity demand. In conjunction with an overall plant quality control program (PEF, LLC 1999a, AFC §§ 4.3.5.1, 4.3.5.2), staff

expects that this will ensure 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 PEF will burn natural gas from the existing Kern River/Mojave interstate pipeline system, transmitted to the plant via a new 16- to 24-inch diameter pipeline (PEF, LLC 1999a, AFC §§ 1.3.3, 1.3.4, 3.1, 3.4.7, 3.7.1.1, 3.9.2.6.3, 4.3.3.1, 4.3.3.2). This natural gas system, which provides access to gas from the Northwest and the Southwest, represents a resource of considerable capacity. This system offers access to far more gas than the plant would require (PEF, LLC 1999a, AFC §§ 3.9.2.6.3, 4.3.3.1, 4.3.3.2). Staff agrees with the applicant's prediction that there will be adequate natural gas supply and pipeline capacity to meet the project's needs.

WATER SUPPLY RELIABILITY

The PEF will obtain water from the California Aqueduct through the Wheeler Ridge-Maricopa Water Storage District (WRMWSD) via a new 250 foot-long, 20- to 30-inch diameter pipeline to a 54-inch diameter pipeline to be built by WRMWSD. the WSD, with its extensive underground storage capacity, represents a reliable source of water (PEF, LLC 1999a, AFC §§ 1.3.1, 1.3.3, 1.3.5, 3.1, 3.4.8.1.2, 3.7.2, 4.3.4; Appendix S). If this source does not prove feasible, the applicant proposes two alternative water sources:

- purchase of State Water Project entitlements; or
- purchase of water supplies from third party suppliers (PEF, LLC 1999a, AFC § 3.11.4.1).

Staff believes this plan yields sufficient likelihood of a reliable supply of water. (For further discussion of water supply, see that portion of this document entitled **Water Resources**.)

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. Tsunamis (tidal waves) and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but high winds, flooding and seismic shaking (earthquake) present credible threats to reliable operation (see those portions of this document entitled **Facility Design** and **Geology and Paleontology**).

WIND

The applicant will design the PEF to withstand high winds by complying with the applicable LORS, including the California Building Code (PEF, LLC 1999a, AFC § 4.1.1.2). Staff believes that this will provide adequate protection from winds.

FLOODING

While published flood insurance maps show the site to lie within a 100-year flood zone, the applicant has produced a study that shows this not to be the case (PEF, LLC 1999a, AFC §§ 3.3.1, 3.5.8; Appendix M). The applicant will design the PEF to withstand a 100-year storm (PEF, LLC 1999a, AFC § 3.5.8). For further discussion, see that portion of this document entitled **Geology and Paleontology**.)

SEISMIC SHAKING

The site lies within Seismic Zone 4 (PEF, LLC 1999a, AFC §§ 3.5.1, 4.1.1.1). Several active earthquake faults lie nearby. The project will be designed and constructed to the latest appropriate LORS. 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

All the candidate gas turbines that may 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 of 95 percent or greater (PEF, LLC 1999a, AFC §§ 1.3.2, 3.4.1, 3.9.2.6) appears quite 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 gas turbines that make up the NERC statistics. Further, since the plant will consist of three 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 (PEF, LLC 1999a, AFC §§ 3.9.2.1.2, 3.9.2.6.1, 4.3.1.1, 4.3.1.4). 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 project 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

The applicant predicts an equivalent availability factor of 95 percent or higher, which staff believes is achievable in light of the industry norm of 91 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.

REFERENCES

Detmers, Jim. 1999. Director of Maintenance and Reliability, California Independent System Operator. Interview with Steve Baker (California Energy Commission), July 13, 1999.

Duke Energy. 1999h. Letter describing changes to Moss Landing Power Plant Project, i.e., upgrade change to existing Units 6 & 7, submitted to the California Energy Commission on September 7, 1999.

GTW (Gas Turbine World). 1999. *Gas Turbine World*, September-October 1999, pp. 20-23.

Mavis, Steve. 1998. Transmission Planner, California Independent System Operator. Telephone conversation with Steve Baker (California Energy Commission), January 23, 1998.

McGraw-Hill (McGraw-Hill Energy Information Services Group). 1994. *Operational Experience in Competitive Electric Generation, an Executive Report*, 1994.

NERC (North American Electric Reliability Council). 1999. 1994-1998 Generating Availability Report.

PEF (Pastoria Energy Facility) 1999a. Application for Certification, Volumes I and II, Pastoria Energy Facility (99-AFC-7). Submitted to the California Energy Commission, November 30, 1999.

PEF (Pastoria Energy Facility) 2000 a. Response to CEC Data Adequacy Comments dated December 29, 1999 (Supplement to AFC-99-7). Submitted to the California Energy Commission, January 5, 2000.

POWER PLANT EFFICIENCY

Steve Baker

INTRODUCTION

The Energy Commission makes findings as to whether energy use by the Pastoria Energy Facility (PEF) 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 PEF'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

Pastoria Energy Facility, LLC (Pastoria) proposes to construct and operate a (nominal) 750 MW combined cycle power plant to generate baseload and load-following power (Pastoria 1999a, AFC §§ 1.1, 1.3.2, 3.4.1, 3.9.2.1.1; Appendix A, Figure A-1). The PEF will consist of three F-class combustion turbine generators with inlet air coolers or chillers producing approximately 168 MW each, three heat recovery steam generators (HRSGs), one 185 MW reheat steam turbine generator and one 90 MW reheat steam turbine generator, arranged in a two-on-one and a one-on-one combined cycle train, totaling approximately 750 MW (Pastoria 1999a, AFC §§ 1.3.2, 3.1, 3.4.1, 3.4.4.1, 3.4.8.3, 3.9.2.1.3). The gas turbines will be equipped with Xonon™ NOx control technology if it is available in time to meet project construction schedules. Otherwise, NOx control will be accomplished with dry low-NOx combustors and selective catalytic reduction (PEF 1999a, AFC §§ 1.1, 3.4.1, 3.4.4.3, 3.11.3.2). Provision will be made to upgrade the plant output at a future time by installing a fourth gas turbine generator and HRSG, and a larger steam turbine generator, yielding two two-on-one combined cycle trains (PEF 1999a, AFC §§ 1.1, 1.3.2, 3.1, 3.4.3, 3.11.3.3).

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 PEF will burn natural gas at a maximum rate up to 126 billion Btu per day LHV[1] (PEF 1999a, AFC § 1.3.4). 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 peak load efficiency of approximately 54.9 percent LHV (PEF 1999a, AFC §§ 1.3.2, 3.4.1); compare this to the average fuel efficiency of a typical utility company baseload power plant at approximately 35 percent LHV.

[1] Lower heating value.

ADVERSE EFFECTS ON ENERGY SUPPLIES AND RESOURCES

The applicant has described its sources of supply of natural gas for the PEF (PEF 1999a, AFC §§ 1.3.3, 1.3.4, 3.1, 3.4.7, 3.7.1, 3.9.2.6.3, 4.3.3.1, 4.3.3.2). The project will burn natural gas from an existing Kern River/Mojave interstate pipeline. The existing gas supply infrastructure is extensive, with pipelines owned by Kern River, Mojave, PG&E, Transwestern, El Paso Natural Gas and others offering access to vast reserves of gas from the Northwest and Southwest. These sources represent far more gas than would be required for a project this size. It is therefore highly unlikely that the PEF could pose a substantial increase in demand for natural gas in California.

ADDITIONAL ENERGY SUPPLY REQUIREMENTS

Natural gas fuel will be supplied to the project via a new 11.65-mile long, 16- to 24-inch diameter pipeline (identified in the AFC as Alternate Route 3C) from the existing Kern River/Mojave 42-inch diameter pipeline (PEF 1999a, AFC §§ 1.3.3, 1.3.4, 3.4.7, 3.7.1.1).[2] The natural gas supply system in California described above is so large and well-established, there is no real likelihood that the PEF will require development of new sources of energy.

COMPLIANCE WITH ENERGY STANDARDS

No standards apply to the efficiency of the PEF or other non-cogeneration projects.

ALTERNATIVES TO REDUCE WASTEFUL, INEFFICIENT AND UNNECESSARY ENERGY CONSUMPTION

The PEF 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 PEF will be configured as a compound-train combined cycle power plant, in which electricity is generated by three gas turbines, and additionally by two reheat steam turbines that operate on heat energy recuperated from the gas turbines' exhaust (PEF 1999a, AFC §§ 1.1, 1.3.2, 3.4.1, 3.4.4.2; Appendix A, Figure A-1). 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.

---

[2] The applicant originally proposed a total of three alternate gas pipeline interconnection routes, ranging in length from 11.65 to 18.5 miles (Pastoria 1999a, AFC § 3.7.1.2). Two routes have been dropped from consideration (Pastoria 2000jk).

The number of turbines further contributes to efficiency at part load. Gas turbine generators operate most efficiently at one particular output level, typically at full load. Whenever desired output is less than full load, the unit must be throttled back. Rather than being forced to throttle back one large turbine, with the consequent reduction in efficiency, the power plant operator will have the option of shutting off one or two gas turbines. This allows the plant to generate at less than full load while maintaining optimum efficiency, suitable for a plant meant for flexible generation, such as load-following duty. Loads down to 33 percent of full load allow one gas turbine, operating at full load, and one steam turbine to maintain peak efficiency.

EQUIPMENT SELECTION

Modern gas turbines embody the most fuel-efficient electric generating technology available today. The F-class gas turbines to be employed in the PEF represent some of the most modern and efficient such machines now available. The applicant will employ a combined cycle power train from a prominent manufacturer. One candidate machine is the General Electric Frame 7FA, an F-class gas turbine nominally rated at 530 MW and 56.5 percent efficiency at ISO[3] conditions in a two-on-one combined cycle configuration, and 262.6 MW and 56.0 percent efficiency in a one-on-one combined cycle (GTW 1999b). The applicant predicts a fuel efficiency, at site conditions, of 54.9 percent LHV (PEF 1999a, AFC §§ 1.3.2, 3.4.1 ; Appendix A, Figure A-1).

A possible alternative is the Siemens-Westinghouse 501F, nominally rated in a two-on-one combined cycle at 550 MW and 55.8 percent efficiency LHV at ISO conditions, and in a one-on-one combined cycle at 273.5 MW and 55.5 percent efficiency LHV (PEF 1999a, AFC §§ 1.1, 3.4.1; GTW 1999b).

Another possible alternative is the ASEA Brown-Boveri KA-24, still another F-class machine. While the KA-24 promises slightly higher fuel efficiency (57.6 percent) (GTW 1999b) than the other F-class machines, any differences among the three in actual operating efficiency will be insignificant. Selecting among these machines is thus based on other factors, such as generating capacity, cost, ability to meet air pollution limitations, and commercial availability. 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 271 MW (Orsini 1999, pers. comm.). The GE and Siemens-Westinghouse machines, which can be configured more flexibly, offer some advantage here.

Note that the Xonon™ NOx control technology is currently being developed by Catalytica Combustion Systems and General Electric. If this technology is available only on the GE machines, this could determine which gas turbines would be selected for the project.

[3] International Standards Organization (ISO) standard conditions are 15°C (59°F), 60 percent relative humidity, and one atmosphere of pressure (equivalent to sea level).

EFFICIENCY OF ALTERNATIVES TO THE PROJECT

The project objectives include the flexibility to generate baseload or load following electricity, as market conditions dictate (PEF 1999a, AFC §§ 1.3.2, 3.1, 3.4.1, 3.9.1, 3.9.2.1.1, 3.11.3.3).

Alternative Generating Technologies

The applicant addresses alternative generating technologies in its application (PEF 1999a, AFC §§ 3.11.3.1, 3.11.3.2, 3.11.3.3). Oil-burning, coal-burning, solar, wind, hydroelectric, biomass and geothermal technologies are all considered. 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 best available fuel efficiency, 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 greater efficiency. While the 501G is rated at 58 percent efficiency (GTW 1999b), 2.2 percent higher than the 501F, the G machine produces 365 MW to the 501F's 273.5 MW. A 750 MW power plant would thus require only two combustion turbine generators; this would restrict operating flexibility. Additionally, the 501G is brand new; the first such machine has only recently begun operating at a site in Florida owned by Lakeland Electric and Water (Power 1999), and a second such machine is in construction at PG&E Generating's Millennium project in Charlton, Massachusetts. Given the minor efficiency improvement promised by the G-class turbine, the likelihood that the plant will frequently be dispatched at less than full load, 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. The first such plant is now in the permitting stage; Sithe Energies will build an 800 MW

facility in Scriba, New York, based on two General Electric Frame 7H gas turbine generators in a two-on-one configuration (GTW 1999a). Claimed fuel efficiency is 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. This first Frame 7H application is not expected to enter service until the end of 2002. Given the lack of proven performance, and the reduction in operating flexibility from fewer gas turbines (two instead of three), 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 and the chiller; both devices increase power output by cooling the gas turbine inlet air. A 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 evaporative cooler boosts power output best on dry days; it uses less electric power than a chiller, possibly yielding slightly higher operating efficiency.

The applicant proposes to choose one of four alternative methods of inlet air cooling (PEF 1999a, AFC § 3.11.3.4):

- evaporative inlet air cooling, yielding a modest power gain with potable water;
- inlet air fogging, giving a greater power gain but requiring demineralized water;
- absorption chilling, yielding a still greater power gain but consuming steam and involving greater capital costs; and
- mechanical chilling (refrigeration), similar to absorption chilling but consuming electricity in place of steam.

The difference in efficiency among these techniques is relatively insignificant. 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, selecting any of these four technologies, will yield no significant adverse energy impacts.

In conclusion, the project configuration (three-train 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 resources impacts when aggregated with the PEF.

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 and Power Exchange 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 PEF, if constructed and operated as proposed, would generate 750 MW of electric power at an overall project fuel efficiency of approximately 54.9 percent. While it will consume substantial amounts of energy, it will do so in the most efficient manner practicable. It 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. No energy standards apply to the project. Staff therefore concludes that the PEF would present no significant adverse impacts upon energy resources.

No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.

RECOMMENDATION

From the standpoint of energy efficiency, staff recommends certification of the PEF. No Conditions of Certification are proposed.

REFERENCES

GTW (Gas Turbine World). 1999 a. *Gas Turbine World*, November/December 1999, page 42.

GTW (Gas Turbine World). 1999 b. *Gas Turbine World 1999-2000 Performance Specs*, volume 19. December 1999.

Orsini, S. 1999. Applications Engineer, ABB Power Generation Systems, Inc. Telephone conversation with Steve Baker (California Energy Commission), February 18, 1999.

PEF (Pastoria Energy Facility) 1999a. Application for Certification, Volumes I and II, Pastoria Energy Facility Project (99-AFC-7). Submitted to the CaliforniaEnergy Commission, November 30, 1999.

PEF (Pastoria Energy Facility/Parquet). 2000a. Project Description Clarification for the Pastoria Energy Facility. Submitted to the California Energy Commission/Rhoads on March 1, 2000.

Power (Power Magazine). 1994. "Operating and maintaining IPP/cogen facilities," *Power*, September 1994, p. 14.

Power (Power Magazine). 1999. "Huge and tiny turbine projects move forward," *Power*, September/October 1999, p. 5.

TRANSMISSION SYSTEM ENGINEERING

Mark Hesters and Al McCuen

INTRODUCTION

The Transmission System Engineering (TSE) analysis provides the basis for the findings in the Energy Commission's decision. This preliminary staff assessment indicates 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.

The Pastoria Energy Facility, Limited Liability Company (PEF, LLC), the applicant, proposes to connect their project, the Pastoria Energy Facility (PEF) to Southern California Edison's (Edison) 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 Energy Commission will rely on the Cal-ISO's determinations to make its finding related to applicable reliability standards, the need for additional transmission facilities, and environmental review of the whole of the project. In this case, staff is primarily a facilitator, coordinating the Cal-ISO's process and results with the certification process and the Energy Commission decision. The Cal-ISO will provide testimony at the Energy Commission's hearings.

Staff's analysis also evaluates the power plant switchyard, outlet line, termination facilities and outlet alternatives identified by the applicant and provides proposed conditions of certification to ensure that the project complies with applicable LORS during the design, construction, operation and potential closure of the project.

Public Resources Code, section 25523 requires the Energy Commission to "prepare a written decision…which includes: …findings regarding conformity of the proposed site and related facilities…with public safety standards…and with other relevant local, regional, state, and federal standards, ordinances, and laws." Under the California Environmental Quality Act (CEQA) the Energy Commission must conduct an environmental review of the "whole of the project," which may include facilities not licensed by the Energy Commission (CCR, tit. 14, §15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities 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.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction", formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate

service and safety to persons engaged in the construction, maintenance, operation or use of overhead electric lines and to the public in general.

- CPUC Rule 21 provides standards for the reliable connection of parallel generating stations connected to participating transmission owners.
- Western Systems Coordinating Council (WSCC) Reliability Criteria provides the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria includes the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 "Criteria for Transmission System Contingency Performance" which requires that the results of power flow and stability simulations verify established performance levels. Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or facility loading outside emergency limits) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas. While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).
- North American Electric Reliability Council (NERC) Planning Standards provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions, however the NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).
- Cal-ISO Reliability Criteria also provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid.
- Cal-ISO Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria. These standards will be applied to the assessment of the system reliability implications of the MEC project. Also of major importance to projects which may sell through the California Power Exchange (Cal-PX) are the Cal-ISO Day/Hour Ahead Inter-zonal Congestion Management Scheduling Protocol (SP 10), the Transmission System Loss Management Scheduling Protocol (SP 4), and the Creation of the Real Time Merit Order Stack (SP 11). The Congestion Management Scheduling Protocol

provides that the operation of power plants not violate system criteria when market participants request generation dispatch or the use of major interties. The Real Time Merit Order Stack is developed based on increasing energy bid prices so that the least cost bids are accepted early on and if congestion is anticipated the highest bids are not selected. The Transmission System Loss Management Scheduling Protocol uses the Cal-ISO power flow model to identify total transmission losses at each generating unit and scheduling point. Additional calculations are performed to determine the actual net power output required by the generating units to meet their scheduled obligations. (Cal-ISO 1998a, Cal-ISO 1998b).

- Cal-ISO Participating Generator Agreement consists of detailed explanations of the requirements in the Cal-ISO Tariff pertaining to the paralleled generating unit.

PROJECT DESCRIPTION

The PEF will provide a maximum electrical output of 750 megawatts (MW). The site is approximately 30 miles south of Bakersfield and just north of the Tehachapi Mountains. The PEF site is approximately 1.38 miles north of the Edison Pastoria substation. (PEF1999a, pages 3.1-2 and 3.1-3)

The applicant plans to construct a 230 kilovolt (kV) (see **Definition of Terms**) switchyard and approximately 1.38 miles of overhead double circuit 230 kV transmission line. The transmission line will terminate at Edison's 230 KV Pastoria Substation.

Edison is currently preparing a Facilities Study for the PEF project. This study will determine whether or not the operation of PEF will necessitate the construction of downstream transmission facilities. Staff expects to receive this study in July of 2000 and the results will be included in the Final Staff Assessment.

PROJECT SWITCHYARD

The project switchyard will consist of ten 230 kV circuit breakers in a ring bus scheme using ten bays. Six bays will connect to the incoming lines from the PEF generator transformers and the remaining four breakers will connect to the outgoing lines. (PEF 1999a, page 3.4-11).

Short-circuit analyses are conducted to assure that breaker ratings are sufficient to withstand high levels of current during a fault (such as when a line touches the ground). The switchyard components will be rated in accordance with the results of a short-circuit study. The acceptability of breaker ratings will be verified during the compliance phase of the certification process.

TRANSMISSION LINE CHARACTERISTICS

The proposed line will be a 230 kV double circuit overhead line extending approximately 1.38 miles from the PEF powerplant switchyard to the existing Pastoria substation. The line will terminate at an existing, vacant bay at the Pastoria substation. Each phase of the two three-phase lines will be made of 1590 kcmil aluminum conductor with steel reinforcement (ACSR). The normal rating for

this conductor at 230 kV is 1,100 mega-volt-amps (MVA) or about 1,000 megawatts (MW), assuming a 0.90 power factor. (PEF 1999a, 3.6-1). Each circuit of the double circuit will be able to carry the total output of the PEF. Steel lattice towers will support the transmission line. The height of the towers will vary between 100 and 120 feet and they will be designed to insure at least thirty feet of conductor-to-ground clearance. Unless the Facilities Study indicates there are reliability concerns, this configuration of conductors and support structures is acceptable.

ALTERNATIVE TRANSMISSION LINE ROUTES

Pastoria analyzed one interconnection alternative for the PEF. The alternative route connects the PEF to the Pardee substation 39 miles away. This alternative is inferior to the proposed route because of the added line length (PEF 1999a, page 3.11-9).

EXISTING FACILITIES AND RELATED SYSTEMS

The map, Figure 1, illustrates existing electric facilities located near the PEF project site. Specific facilities in close proximity to the interconnection include:

- The California Department of Water Resources' Edmonston Pumping plant lies approximately 1.0 mile south of the PEF.
- The PEF outlet line will parallel the Edison Magunden-Pastoria 230kV lines.

SYSTEM RELIABILITY

INTRODUCTION

A system reliability study is performed to determine the affects of connecting a new power plant to the existing electric grid. The study identifies impacts and also ways negative impacts can be minimized or negated. Any new transmission facilities such as the power plant switchyard, the outlet line, and, or downstream facilities, required for connecting a project to the grid are considered part of the project and are subject to the full AFC review process.

Staff has not provided any reliability or congestion analysis in this document. Staff will complete the system reliability analysis after receiving the Facility Study and the Cal-ISO preliminary approval letter for the project. Staff expects the Facilities Study for the PEF will be completed sometime in July of 2000. The Cal-ISO will then review the study and generally responds within two weeks of their receipt of the study. Hence, the system reliability analysis will be included in the Final Staff Assessment.

SYSTEM RELIABILITY STUDY

A system reliability evaluation determines whether the new project would cause thermal overloads, voltage violations (voltages too high or low), and/or electric system instability (excessive oscillations). In addition to the above analysis, studies may be performed to verify that sufficient reactive power (see Definition of Terms) is available. The reliability evaluation must be conducted for all credible "emergency"

conditions. Emergency conditions could include the loss of a single or double circuit line, the loss of a transformer or generator, or a combined loss of these facilities. A Detailed Facilities Study (DFS) is conducted in advance of potential system changes, such as the addition of the PEF project into the system, in order to prevent criteria violations. The criteria used in this evaluation include the WSCC Planning Criteria, NERC Planning Standards and applicable Cal-ISO reliability criteria.

Short-circuit analyses are conducted to assure that breaker ratings are sufficient to withstand high levels of current during a fault (such as when a line touches the ground). Generally when circuit breakers are not adequate the applicant must replace them. The replacement of circuit breakers is usually a “within the fence” modification and does not warrant further environmental analysis.

The California Department of Water Resources (DWR) has expressed concerns about the affect of the PEF project on the DWR facilities near the Pastoria substation. Potential impacts of the PEF on DWR facilities is being analyzed in the Facilities Study. The results of this study will be discussed in the Final Staff Assessment.

ALTERNATIVES

This section addresses transmission alternatives studied for the proposed site. Alternative site analysis is presented in the **Alternatives** section of the staff assessment. The applicant analyzed interconnection point, voltage, conductor, number of circuit, and route alternatives (PEF 1999a, pages 3.11-9 and 3.11-10).

CUMULATIVE IMPACTS

There is only one proposed project (Antelope Valley) that could have significant cumulative transmission system impacts with the PEF. Several other projects have either been approved (La Paloma Generating Project) or are seeking Energy Commission certification (Sunrise Cogeneration and Power Project, Elk Hills Power Project and the Midway Sunset Cogeneration Company Project) and are geographically close to the proposed PEF but are not electrically close. Other proposed projects in California are either located far enough away from the PEF that they do not significantly impact transmission lines affected by the PEF or are located in areas with robust transmission networks that can accommodate generation from many new power plants before significant downstream facilities are required.

The PEF will connect to the Edison electric network at the Pastoria substation. This substation is part of a radial electric system that primarily delivers power from the Big Creek hydroelectric plants and several qualifying facilities to southern California. The Antelope Valley Project proposed an interconnection at the Antelope Valley substation that is also part of the Big Creek radial system (see Figure 1). According to the original Facility Study for the PEF, If both Pastoria and Antelope Valley connect to this radial system, significant transmission facility upgrades and replacements will be required (PEF/Vartania 1999a, pages 8-13). These facility requirements would be so costly that staff does not expect that both projects will connect to the Big Creek Radial network.

Projects proposed in Kern County, the La Paloma Generating Project, the Sunrise Cogeneration and Power Project, the Elk Hills Generating Project, and the Midway-Sunset Cogeneration Company Project while physically close to PEF are electrically distant. These Kern County projects connect to Pacific Gas and Electric's (PG&E) transmission network and the impacts of these projects are essentially, electrically isolated from PEF. The Pastoria Project connects to a radial set of transmission lines in the Edison system. In order for power generated by PEF to impact the same lines as the other Kern county projects it must flow south into the Edison main network and back up through the Vincent substation towards northern California on the bulk power system. Once on the bulk transmission system, the power generated by PEF could increase congestion on Path 15[1] but would not have significant reliability impacts. Other projects in northern California, such as Three Mountain Power Project and the Sutter Power Project, are even farther away from PEF electrically and would have fewer cumulative impacts than the Kern County plants.

Staff does expect any cumulative impacts resulting from other proposed powerplants operating in southern California and PEF. The PEF connects to the Big Creek radial system and the power it generates functions electrically like an import into the rest of the Edison system. Except for a few radial networks, the Edison electric system is highly redundant and will be able to accommodate the generation of many new power plants without requiring downstream electric facilities.

FACILITY CLOSURE

The parallel operation of generating stations is controlled in part by CPUC Rule 21. This rule and standard utility practices for interconnecting a generating unit provide for the participating transmission owner (PTO) to have control of breakers and disconnect switches where the outlet line terminates (the Pastoria substation) and general control over the interconnected generators. Prior to construction and interconnection of a generating unit, the PTO reviews and comments on the plans and specifications for the power plant and termination equipment that is important to safe and reliable parallel operation[2] and inspects the interconnection facilities. Contractual provisions may be developed to provide backup, or other power service, and codify procedures to be followed during parallel operation. Before generating stations are permitted to bid into the Cal-PX and be dispatched by the Cal-ISO, generator standards must be met and the generating station must commit to comply with instructions of the Cal-ISO dispatchers. All participating generators must sign a Participating Generator Agreement (Cal-ISO 1998a, Cal-ISO 1998b). Procedures for planned, unexpected temporary closure and unexpected permanent closure must be developed or verified to facilitate effective communication and

[1] Path 15 the set of lines that limit the import of power into Northern California from Southern California and hence the Southwestern United States.

[2] As an example, the PTO has control over the generating unit breakers so that only when the PTO's line crews have completed maintenance, for instance, and are clear of the line or other facilities, could the unit reclose the system.

coordination between the generating station owner, the 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 public nuisance or a hazard to life or property." A condition of certification will require 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

This type of 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 PTO[3] to assure (as one example) that the PTO's system will not be closed into the outlet thus energizing the project substation. 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 loads.[4]

UNEXPECTED TEMPORARY CLOSURE

This unplanned 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 (see General Conditions Including Compliance Monitoring and Closure Plan).

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs when the project owner abandons the facility. This is considered to be a permanent closure. 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. An on-site contingency plan, that is in place and approved by the CPM prior to the beginning of commercial operation of the facilities, will be developed to assure safety and reliability (see General Conditions Including Compliance Monitoring and Closure Plan).

[3] The PTO, in this instance, is Edison, e.g., the system owner to which the project is interconnected.

[4] These are mere examples, many more exist.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff is withholding conclusions until the analysis of the Facility Study is completed. However the current configuration for the powerplant switchyartd, outlet line and termination facilities appears acceptable.

RECOMMENDATIONS

Staff proposes the following, preliminary conditions of certification to insure system reliability and conformance with LORS. The final staff recommended conditions of certification will be included in the Final Staff Assessment after the review of the Facilities Study.

CONDITIONS OF CERTIFICATION

Staff will propose conditions of certification after receiving the Facility Study and the Cal-ISO preliminary approval.

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.

NERC (North American Electric Reliability Council). 1998. NERC Planning Standards, September 1997.

WSCC (Western Systems Coordinating Council) 1997. Reliability Criteria, August 1998.

PEF (Pastoria Energy Facility) 1999a. Application for Certification, Volumes I and II, Pastoria Energy Facility Project (AFC-99-7). Submitted to the California Energy Commission on November 30, 1999.

SCE (Southern California Edison/Vartania) 1999a. System Impact Study. Submitted to the California Energy Commission on December 31, 1999.

DEFINITION OF TERMS

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.

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) which 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.

Loop — An electrical cul de sac. A transmission configuration which 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.

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

Kae C. Lewis

PURPOSE OF THE ALTERNATIVES ANALYSIS

Staff is required to examine the "feasibility of available site and facility alternatives to the applicant's proposal that substantially lessen the significant adverse impacts of the proposal on the environment". The purpose of staff's alternatives analysis is to provide the Energy Commission with an analysis of a reasonable range of feasible alternative sites which could substantially reduce or avoid any potentially significant adverse impacts of the proposed project. (Cal. Code Regs, tit. 14, §15126(d); Cal. Code Regs., tit. 20, § 1765.) This analysis identifies the potential significant impacts of the proposed project, technology alternatives, and alternative sites that are capable of reducing or avoiding significant impacts.

ALTERNATIVE ANALYSIS CRITERIA

The "Guidelines for Implementation of the California Environmental Quality Act" (CEQA), Title 14, California Code of Regulations Section 15126(d), provide 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 project objectives...". In addition, the analysis must address the "no project" alternative. (Cal. Code Regs., tit. 14, §15126(d).)

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.)

To prepare this alternatives analysis, the staff used the methodology summarized below:

- Identify the basic objectives of the project.
- Identify and evaluate alternatives to the project. The principle project alternatives examined that do not require the construction of a natural gas-fired facility are increased energy efficiency (or demand side management) and construction of alternative technologies (e.g., geothermal, biomass, wind or solar).
- dentify and evaluate alternative locations or sites.
- Evaluate the impacts of not constructing the project (the "no project" alternative).

DETERMINING THE SCOPE OF THE ALTERNATIVES ANALYSIS

The purpose of staff's alternatives analysis is to provide the Energy Commission with a reasonable range of feasible alternatives which could substantially reduce or avoid any potentially significant adverse impacts of the proposed project. To accomplish this, staff must determine the appropriate scope of analysis. Consequently, it is necessary to identify and determine the potential significant impacts of the proposed project and then focus on alternatives that are capable of reducing or avoiding significant impacts. This section presents staff's analysis of generation and siting alternatives, and the "no project" alternative [CEQA Guidelines, section 15112(d)(2)].

In the evaluation of alternatives, consideration was given to the underlying objectives of the proposed project. The applicant confined the geographic area for site or location alternatives to the boundaries of Tejon Ranch which comprises 270,000 acres in Kern and Los Angeles counties. These location alternatives are consistent with the applicant's project objectives and siting criteria. Staff is exploring an additional site alternative further removed from the proposed project site which will be more fully assessed in the FSA.

Another area of alternatives are those of specific technologies related to the generation choices for the PEF project. For example, in the air quality technical area there are different types of equipment that can be deployed to mitigate air pollutant emissions. The indepth discussion of such technology alternatives are included in this PSA's technical area chapters.

BASIC OBJECTIVES OF THE PROJECT

After studying the Applicant's Application for Certification (AFC), Energy Commission staff has determined the PEF project's objectives to be:

To construct and operate a merchant power plant in the region that supplies economic, reliable, and environmentally sound electrical energy and capacity to southern California in the newly deregulated power market.

To operate a baseload facility at maximum continuous output for as many hours per year as will be profitable.

To locate near key infrastructure, such as transmission line interconnections, and supplies of process water and natural gas at competitive prices.

To sell electric power at a price that provides a clear benefit to customers while returning a profit that justifies the resources that the owners have invested and the risk incurred.

To construct and operate a plant that utilizes tested and reliable technology, but also explores and utilizes new technology where economically and commercially feasible.

PROJECT DESCRIPTION AND SETTING

A more complete description of the project and its setting is in the **Project Description** section of this Preliminary Staff Assessment (PSA).

POWER PLANT

Located in the southern Kern County region, this section of the Tejon Ranch property is undeveloped, vegetated with non-native grassland, and is used primarily for cattle raising. The two existing parcels on which the proposed PEF project would be located are zoned as agricultural land.

The proposed PEF project would be a nominal 750-megawatt, combined-cycle, natural gas-fired power plant with three combustion turbine generators/heat recovery steam generator (HRSG) combinations. Steam generated in the three HRSGs would be combined and used to run two steam turbine generators. The power plant site is approximately 30 acres in size and is located in a historic land grant area (El Tejon). The proposed site is located 0.75 mile north of the California Department of Water Resources' Edmonston Pumping Plant which conveys water from the California Aqueduct over the Tehachapi Mountains to southern California (PEF 1999a, p. 3.1-2) See **ALTERNATIVES Figure 1** for a map of the location of the proposed project site and related facilities. The PEF would be the first power plant located on Tejon Ranch property.

RELATED FACILITIES

TRANSMISSION LINE

Electricity generated by the PEF would be transmitted to Southern California Edison's Pastoria Substation approximately 1.4 miles south of the power plant site. The majority of the proposed line parallels an existing transmission corridor.

WATER SUPPLY PIPELINE

The primary water supply for the PEF project would be provided by the Wheeler Ridge-Maricopa Water Storage District (WRMWSD). WRMWSD will convey this supply through the California Aqueduct and the district's distribution system to a 0.2 mile pipeline connecting to the PEF project site. The backup water supply is proposed to be supplied through Azurix, a water brokering firm. Azurix will supply water from water districts with access to groundwater storage within the Kern County Water Agency when surface water is not available from WRMWSD.

ALTERNATIVES Figure 1

Location of the Proposed Site and Related Facilities

WASTEWATER DISPOSAL

To dispose of process wastewater, PEF proposes to use a wastewater management system which incorporates treatment for zero liquid discharge (ZLD). The ZLD system will process all wastewater streams from the plant except sanitation and stormwater streams. The ZLD process which concentrates the dissolved and suspended constituents in the wastewater through a combination of evaporation and crystallization will result in two to eight cubic yards per day of non-hazardous salt cake. Sanitary wastewater from sinks, toilets, and other sanitary facilities will be disposed of onsite by a septic system and leach field. Stormwater will be collected onsite using surface and underground drainage, and discharged to an onsite storm water detention pond.

NATURAL GAS SUPPLY PIPELINE

The proposed PEF project will use natural gas supplied through an 11.65 mile interconnection pipeline (built for the PEF project) to the existing supply pipeline jointly owned by the Kern River Gas Transmission Company and the Mojave Pipeline Company. The pipeline route runs northeast of the plant site. The project will utilize up to an estimated 120 million standard cubic feet per day of pipeline quality natural gas. The proposed gas line route (referred to as Route 3) is shown on **PROJECT DESCRIPTION Figure 2**.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS

At this time there are five technical areas that may have identified potential significant environmental impacts: air quality, biological resources, land use, soil and water resources, and visual resources. It is staff's opinion that ultimately the outstanding issues in these areas can be resolved and that environmental impacts can be reduced to less than significant levels.

Because the PEF project may have significant cumulative impacts on ***air quality,*** staff has proposed mitigation measures. One of those mitigations will be BACT (Best Available Control Technology), either XONON or SCR (selective catalytic reduction), for the control of No_x emissions. The unresolved issue concerns the level of ammonia slip (or leakage) if the SCR method is utilized. The Applicant has proposed a slip level of 10 ppm and the staff is recommending a slip level of 5 ppm which it believes is consistent with USEPA and Bay Area Air Quality Management District directives. This issue is not relevant if non-thermal generation alternatives are employed. It would be relevant, however, at any alternative location where the need for NO_x emissions control was mitigated using SCR technology. At this point the PEF preference is the application of a new BACT technology called XONON which does not require ammonia. (See the **Air Quality** chapter for an indepth discussion of technologies for NO_x emissions control.)

In the ***biological resources*** area several important issues are currently unresolved. To comply with its obligations under the federal Endangered Species Act, PEF is currently seeking an open space easement to maintain habitat within a

historic kit fox movement corridor area. PEF is required to first, secure this open space easement from Tejon Ranch and, second, comply with other obligations before receiving federal and state authorization for the project to be constructed. Although the completion of these requirements appears to be very likely, it is not absolutely certain at this time. As noted below, non-thermal generation alternatives and location alternatives are not likely to resolve these biological resources issues. (See the **Biological Resources** chapter for an indepth discussion of these issues.)

The ***land use*** issue concerns the subdivision of land that is required to create a land parcel for the PEF project and the use of this land for non-agricultural enterprises. The Applicant has submitted a parcel map to Kern County for their review to comply with the California Subdivision Map Act. In addition the land on which the PEF plant is to be constructed is currently under the Williamson Act which restricts the use of the land to agriculture. Cancellation is necessary if the land is to be used for non-agricultural activities. The Map Act and the Williamson Act involve local discretionary processes initiated by Kern County and may require public review. As noted below, generation and location alternatives are not likely to preclude land use modifications. (See the **Land Use** chapter for an indepth discussion of these issues.)

The unresolved issue in ***soil and water resources*** involves the acquisition of a backup water supply for the PEF project. The Applicant is negotiating, through the brokering services of Azurix, option agreements to surface water which is currently stored as groundwater in the aquifer underlying Kern County Water Agency (KCWA). Azurix will execute exchange agreements with water district members of the KCWA who hold entitlements to State Water Project (SWP) water delivered through the California Aqueduct. When PEF must use its backup supply, Azurix will supply SWP water to the project which it has exchanged for its groundwater . These complex water supply arrangements, which require environmental review and KCWA approval, are still in the development stage. Generation alternatives (e.g., non-thermal plants as noted below) that do not have large water requirements are likely to avoid these issues. Location alternatives for thermal power plants that do not require fresh inland waters (i.e., coastal location) will also preclude these issues. Because the need for large amounts of water in thermal plants is due to the cooling tower requirements, another solution could be the application of the dry or hybrid (wet/dry) cooling technology. See the **Soil and Water Resources** chapter for a discussion of this technology alternative.

The ***visual resources*** issue for this project involves visible plumes which are created by the condensation of water in moist air emitted from stacks or cooling towers. Staff has identified a potential significant impact related to heat recovery steam generators (HRSG) stack plumes, however, they have insufficient information to make a determination of significance. Generation alternatives that are non-thermal avoid this issue because they do not require stacks or cooling towers. As noted below, however, non-thermal alternatives can have other visual shortcomings. Location alternatives can reduce this visual concern by siting a plant where the viewing public is minimized (such as out of sight range of a major

highway). (See also the **Visual Resources** chapter for an indepth discussion of this issue.)

ALTERNATIVES TO THE PROJECT

GENERATION TECHNOLOGY ALTERNATIVES

One alternative to meeting California's electricity demand with new generation is to reduce that demand for electricity. Such "demand side" measures include programs that increase energy efficiency, reduce electricity use, or shift electricity use away from "peak" hours of demand[1].

In California there is a considerable array of demand side programs. At the federal level, the Department of Energy adopts national standards for appliance efficiency and building standards to reduce the use of energy in federal buildings and at military bases.

At the state level, the Energy Commission adopts comprehensive energy efficiency standards for most building occupancies, appliance standards for specific appliances not subject to federal appliance standards, and load management standards. The Energy Commission also provides grants for energy efficiency development through the Public Interest Energy Research (PIER) program. The California Public Utilities Commission, along with the Energy Commission, oversees investor-owned utility demand side management programs financed by the utilities and its ratepayers.

At the local level, many municipal utilities administer demand side management and energy conservation programs. These include subsidies for the replacement of older appliances through rebates, weatherization programs, and peak load management programs. In addition, several local governments have adopted building standards which exceed the state standards for building efficiency, or have by ordinance set retrofit energy efficiency measure requirements for older buildings.

Even with this great variety of federal, state, and local demand side management programs, the state's electricity use is still increasing as a result of population growth and business expansion. Current demand side programs are not sufficient to satisfy future electricity needs, nor is it likely that even much more aggressive demand side programs could accomplish this at the economic and population growth rates of the last ten years. (See California Energy Commission, Electricity

[1] Although Public Resources Code Section 25305 provides that demand side alternatives are not to be considered as project alternatives for power plant siting cases, air districts are required to consider alternatives generally prior to issuing Prevention of Serious Deterioration (PSD) permits pursuant to the federal Clean Air Act. Air districts normally rely on the Energy Commission to perform the alternatives analysis for siting cases; these analyses are then relied on for the issuance of the PSD permit. For this reason, Commission staff includes this analysis in its environmental documents for consideration by the air districts.

Report (November 1997, Publication No. P300-90-001), pp. 65-70, A-17 through A-24.)

Therefore, although it is likely that federal, state, and local demand side programs will receive even greater emphasis in the future, both new generation and new transmission facilities will be needed in the immediate future and beyond in order to maintain adequate supplies.

Staff compared various alternative technologies with the proposed project, scaled to meet the project's objectives. Technologies examined were those principal electricity generation technologies which do not burn fossil fuels such as natural gas: solar, wind, and biomass.[2] An evaluation of these technologies indicates that they improve upon some of the significant environmental impacts identified for this project and they worsen others. To both solar and wind generation can be credited the absence or reduction in air pollutant emissions, visible plumes, and need for emissions control. In the case of biomass, however, emissions are substantially greater. In addition, the water consumption for both wind and solar generation are substantially less than for a natural gas fired plant because there is no thermal cooling requirement.

However, the unresolved issues in the biological resources and land use technical areas would probably worsen. Solar and wind resources require large land areas in order to generate 750 megawatts of electricity. Specifically, central receiver solar thermal projects require approximately 5 acres per megawatt; 750 megawatts would require approximately 3,750 acres, or over 100 times the amount of land area taken by the proposed plant site and linear facilities. Parabolic trough solar thermal technology requires similar acreage per megawatt. Wind generation "farms" generally require about 45 acres per megawatt, with 750 megawatts requiring 33,750 acres, nearly 1,000 times the amount of space taken by the proposed plant site and linear facilities.[3] More land requirements in the southern San Joaquin Valley have the potential for significant biological impacts on sensitive species and habitat areas. Need for extensive acreage would also add the complexities of additional local (Kern County) discretionary actions for land use modifications. While there would be no visible plumes, other visual impacts of the solar and wind generation must be considered in an area that has many broad views of the Tehachapi Mountains from Interstate 5.

For biomass generation a fuel source such as wood chips (the preferred source) or agricultural waste is necessary. Neither is available in large quantities close to the PEF plant. In addition, biomass plants are typically under 10 MW which is substantially smaller than the expected capacity of the 750 MW PEF project.

---

[2] There are no geothermal or hydroelectric resources in this section of southern San Joaquin Valley (California Geological Data Map Series #4 (1980); CDWR, California Water Plan Update: Bulletin 160-98, Vol.2, pp. 8-43-54.

[3] California Energy Commission, La Paloma Generating Project, Final Staff Assessment, April 1999, pp. 391

Looking outside the San Joaquin Valley, the development uncertainties and the potential for impacts at remote resource areas are significant constraints. Furthermore, because of the typically lower efficiencies of alternative generation technologies, they do not fulfill a basic objective of this plant: to provide power from a baseload facility to meet the growing demands for reliable power in Southern California. Consequently, staff does not believe that geothermal, hydroelectric, solar, wind and biomass technologies present feasible alternatives to the proposed project.

SITING AND RELATED FACILITIES ALTERNATIVES

SITE ALTERNATIVES

The purpose of this section of the **Alternatives** chapter is to evaluate the siting or location alternatives provided by the Applicant and, if necessary, to propose other possibilities. The evaluation criteria will be based on these questions: 1) will the alternative fulfill the project objectives and siting criteria? 2) will it resolve the issues (significant impacts) identified as problems with the current project proposal? 3) will it cause other significant environmental impacts?

Staff examined two siting alternatives proposed by the Applicant, Alternative Sites A and B (PEF 1999a, Figure 3.11-1; PEF 2000a, pp. ALT-1-4). They are located within the Tejon Ranch and share common attributes. However, Sites A and B were removed from consideration because they caused additional significant environmental impacts due to their proximity to elevated terrain in the Tehachapi Mountains and associated air quality concerns. Preliminary screening indicated that Sites A and B would result in significant concentration levels of No_x, PM_{10} and CO. Site C (the proposed site) was selected as the preferred site based on the evaluation criteria mentioned above. The basic characteristics of each site are presented below. Please see **ALTERNATIVES Figure 2**.

ALTERNATIVE SITE A

Alternative Site A is a vacant, approximately 30-acre unused portion of the property that is in a partially disturbed condition. It is located at the very foot of the Tehachapi Mountains and is situated about 4,500 feet south of the preferred site. It is on the opposite side of the California Aqueduct from the proposed Site C and would require the hauling of all construction and operation materials across the Aqueduct. The topography of the site is rough and would require site grading. As compared to Site C, the delivery of makeup water requires a shorter length of piping but would also require pumping from the Aqueduct. The fuel gas pipeline would require an additional 1.5 miles of piping and would have to cross the California Aqueduct. Because of the terrain of this site, the plant would be less visible from the I-5 corridor (which lies 6.5 miles to the west) using this alternative. This alternative fulfills project objectives and siting criteria. In addition, its selection would not resolve the current issues except that it may reduce plume visibility. However, it introduces an additional significant environmental impact: the mountainous terrain located south, east, and west of the site results in significant concentration levels of criteria air pollutants No_x, PM_{10} and CO.

ALTERNATIVE SITE B

Alternative Site B is about 2,500 feet south of the preferred Site C and lays directly between Sites A and C. It is adjacent to the existing access road and does not require crossing the California Aqueduct. It is a land area which is partially disturbed with rough topography that would require site grading. The site is located at the head of Pastoria Creek and potential hydrological changes to existing creek flow patterns would be required. As compared with Site C, makeup water delivery would, like Alternative A, require a shorter length of piping but would also require pumping from the Aqueduct. This site would require an additional mile of underground gas pipeline. The plant would be only slightly visible from the I-5 corridor. This alternative fulfills project objectives and siting criteria. In addition, its selection would not resolve the current issues except that it would reduce plume visibility. However, because the site is, like Alternative A, located close to the base of the Tehachapi Mountains, it introduces the same significant environmental impact by generating significant concentration levels of NO_x, PM_{10} and CO.

ALTERNATIVES Figure 2
Location of Alternative Sites

ADDITIONAL SITES

The staff may need to evaluate additional location alternatives if the PEF project's current outstanding issues cannot be resolved. In preparation, the staff has considered the site alternatives developed in the LaPaloma Generating Project, Final Staff Assessment (98-AFC-2). The site alternative #2: Elk Hills Road, which is not on Tejon Ranch property, has characteristics similar to the current PEF site. Without further investigation it is not possible to judge whether this site would mitigate potential impacts associated with the PEF site. This alternative is located on an alluvial fan about 10 miles south of Buttonwillow (roughly 30 miles from the current PEF site). The land is currently used for cattle and sheep grazing. An existing transmission line passes the site and connects to Buttonwillow substation owned by PG&E. The California Aqueduct is adjacent to the site and could provide the water supply via the West Kern Water District. The natural gas supply pipeline is within one mile. The distances for linear facilities are greater than what is now possible at the PEF site; the water supply line would be 0.5 vs. 0.2 mile and the transmission line would be 10 vs. 1.4 miles. The exception is natural gas where the pipeline would be substantially shorter in length, 11.65 vs. 1.5 miles (CEC, LPGC Final Staff Assessment, pp. 397-8).

This site appears to generally meet the objectives of the PEF site except that it would require interconnection to the PG&E transmission system rather than to the Southern California market through the Southern California Edison system.

If the issues for this project in air quality, biological resources, land use, soil and water resources, and visual resources cannot be resolved it will become necessary to explore this alternative location and others. These alternatives may also include sites inside Tejon Ranch boundaries if that option is acceptable to the landowner.

RELATED FACILITIES ALTERNATIVES

The following related facilities pertain only to those associated with the applicant's preferred power plant site.

TRANSMISSION LINES

The PEF project includes a 1.38 mile, double circuit, 230 kV transmission line interconnection to the existing Pastoria Substation owned by Southern California Edison (SCE) located south of the preferred plant site (Site C). The majority of the proposed line parallels an existing transmission corridor, therefore, there is no need to consider alternative routes.

WATER SUPPLY

A detailed analysis of raw water supply alternatives will be presented in the Soil and Water Resources section of this PSA. An alternative to the proposed water supply plan could be the use of wet /dry or dry cooling systems for the cooling towers to reduce the PEF plant's water consumption. This alternative, which may

help to reduce the potential significant impacts of PEF's water supply plan, will be presented in the **Soil and Water Resources** chapter.

WASTEWATER DISPOSAL

In the AFC PEF stated that their preferred option for wastewater discharge was Injection into abandoned oil wells located north of the project on Tejon Ranch property. Zero Liquid discharge (ZLD) was proposed as a second option (PEF 1999a, p. 3.11-12). After additional analysis PEF selected ZLD as the preferred option for wastewater discharge (PEF/parquet 2000a). The staff agrees that ZLD is the more enviromentally sound option for PEF's disposal of wastewater because it avoids the potentially more significant environmental impacts of wastewater well injection. This option may also help mitigate for the potential water resource impacts because ZLD involves the recycle and reuse of approximately 5 to 10 percent of PEF's total water consumption.

NATURAL GAS SUPPLY PIPELINE

Natural gas will be supplied through a 16 to 20-inch diameter underground pipeline whose source is the Kern River/Mojave Pipeline. The proposed connection to the transmission pipeline, shown as Route 3 in Figure 1, travels about 11.65 miles from the tie-in point, which is located approximately 6.5 miles north of the project site. Initially two additional pipeline routes were proposed, however, these alternatives posed biological, cultural, and other potential mitigation difficulties and were clearly inferior to the route chosen by PEF.

THE "NO PROJECT" ALTERNATIVE

CEQA Guidelines and Energy Commission regulations require consideration of the "no project" alternative. This alternative assumes that the project is not constructed, and is compared to the proposed project. A determination is made whether the "no project" alternative is superior, equivalent, or inferior to the proposed project.

In the AFC, the applicant presented the "no project" alternative as "… inconsistent with the Project Developer's goals of developing a project that would give the Developer a fair return on the project investment. The No Project alternative would not provide 750 MW of new capacity and energy to the Los Angeles area, nor would it provide 750 MW of new capacity and energy to the State of California. Finally, the No Project alternative would not provide energy and capacity to the State of California electrical supply market." (PEF 1999a, pp. 3.11-12-13)

The project would be a large industrial facility built in a rural area currently zoned for agricultural use. Staff has identified potential significant impacts to biological resources, water resources, and air quality—but it appears likely that these impacts can be mitigated to less than significant levels.

If the project is built, land zoned agricultural (though currently uncultivated) will be permanently removed from agricultural use, and there will be infringement on existing habitat of the kit fox.

If the project were not built, these less than significant environmental impacts would be avoided. For the time being, at least, the land would remain undeveloped and rural in character. There would be no interference with kit fox habitat, no increased emissions, and no increased water use. One could thus conclude that the “no project” alternative is environmentally preferable to the proposed project. However, the County has expressed a willingness to rezone the land in question for development, so it is speculative to say that the “no project” alternative would preserve the site in its present undeveloped state with agricultural zoning.

If the project is not built, the region will not benefit from the relatively clean and efficient source of 750 MW of new generation that this facility would provide. On the other hand, the market conditions that gave rise to this facility may presumably give rise to different but similar power plant generation proposals that would provide similar benefits. It is thus difficult to conclude that “no project” would have serious, long-term consequences on the cost or reliability of electricity in the region. However, “no project” will delay any cost, environmental and reliability benefits.

If other generation projects are built in the same region, they will be likely to have similar air quality emissions and water use impacts. The other environmental impacts of such projects, should they be built, could be either greater or less than that of the current proposal, depending on the site chosen. It is thus impossible to relatively compare the impacts of the proposed project against those of a future with an undetermined site.

The “no project alternative would eliminate the expected economic benefits that the proposed project would bring to Kern County, including increased property taxes, employment, sales taxes, and sales of services, manufactured goods, and equipment. (See the **Socioeconomics** chapter.)

CONCLUSIONS AND RECOMMENDATION

Staff has determined that the proposed power plant site is the best option among those considered principally because it provides fewer air quality impacts than the alternatives developed to date. Staff does not believe that demand side management measures and alternative technologies (geothermal, solar, wind, biomass and hydroelectric) present feasible alternatives to the proposed project.

REFERENCES

PEF (Pastoria Energy Facility) 1999a. Application for Certification, Volumes I and II, Pastoria Energy Facility Project, (99-AFC-7). Submitted to the California Energy Commission,
November 30, 1999.

California Energy Commission, LPGP (LaPaloma Generating Project) 98-AFC-2, Final Staff Assessment, April 1999

California Energy Commission/Richard Grix, High Temperatures and Electricity Demand: An Assessment of Supply Adequacy in California: Trends and Outlook, P300-99-004, July 1999

California Department of Conservation, Division of Mines and Geology, California Geological Data Map Series, Geothermal Resources of California #4, 1980

California Department of Water Resources (CDWR), California Water Plan Update, Bulletin 160-98, Volume 2, November 1999.

GENERAL CONDITIONS
INCLUDING COMPLIANCE MONITORING AND CLOSURE PLAN

Nancy Tronaas

INTRODUCTION

The project General Conditions Including Compliance Monitoring and Closure Plan (Compliance Plan) has 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 conjunction 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:

   a) set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;

   b) set forth the requirements for handling confidential records and maintaining the compliance record;

   c) state procedures for settling disputes and making post-certification changes; and

   d) 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

   e) 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 verifying that the condition has been satisfied.

GENERAL CONDITIONS OF CERTIFICATION

COMPLIANCE PROJECT MANAGER (CPM) RESPONSIBILITIES

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

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

The CPM is the contact person for the 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, it should be understood that the approval would involve all appropriate staff and management.

The Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the 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 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 or inadvertence and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process may need to be publicly noticed unless they are confined to administrative issues and process.

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 taken.

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

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:

1. reporting on the work done and providing the pertinent documentation in monthly and/or annual compliance reports filed by the project owner or authorized agent as required by the specific conditions of certification;
2. appropriate letters from delegate agencies verifying compliance;

3. Energy Commission staff audit of project records; and/or
4. Energy Commission staff inspection 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, and
7. the compliance status for each condition (e.g., "not started", "in progress" or "completed date").

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

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. It will be in the same format as the compliance matrix referenced above.

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. Project owners frequently anticipate starting project construction as soon as the project is certified. In some cases it may be necessary for the project owner to file submittals prior to certification if the required lead-time extends beyond the date anticipated for start of construction. It is also important that the project owner understand that pre-construction activities that are initiated prior to certification are performed at the owner's own risk. Failure to allow specified lead-time may cause delays in start of construction.

Various lead times for verification submittals 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.

MONTHLY COMPLIANCE REPORT

The first Monthly Compliance Report is due the month following the Energy Commission business meeting date that the project was approved, unless the 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 Monthly Compliance Reports within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain at a minimum:

1. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;
3. an initial, and thereafter updated, compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
4. a list of conditions which have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;
5. a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;
6. a cumulative listing of any approved changes to conditions of certification;
7. a listing of any filings with, or permits issued by, other governmental agencies during the month;
8. a projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance conditions of certification;
9. a listing of the month's additions to the on-site compliance file; and
10. any requests to dispose of items that are required to be maintained in the project owner's compliance file.
11. a listing of complaints, notices of violation, official warnings, and citations received during the month; a description of the resolution of any complaints which have been resolved, 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, and
9. an evaluation of the on-site contingency plan for unexpected facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section].
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, which 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 Commission's Project Manager at the time of project certification and shall be made payable to the California Department of Fish and Game. The Commission's Project Manager will submit the payment to the Office of Planning and Research 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. The telephone number shall be posted at the project site and easily visible to passersby during construction and operation.

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 which follows:

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.)

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 which provide the flexibility to deal with the specific situation and project setting which will exist at the time of closure. LORS pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

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

PLANNED CLOSURE

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

UNEXPECTED TEMPORARY CLOSURE

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

UNEXPECTED PERMANENT CLOSURE

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

GENERAL CONDITIONS FOR FACILITY CLOSURE

PLANNED CLOSURE

In order that a planned facility closure does not create adverse impacts, a closure process, that will provide 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.

Also, 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 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 Commission CPM for the purpose of discussing the specific contents of the plan.

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

UNEXPECTED TEMPORARY CLOSURE

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

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less 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 on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and

recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

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

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

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

If the CPM determines that a 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 on-site 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 on-site 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, e-mail, etc., 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 other period of time agreed to by the CPM).

DELEGATE AGENCIES

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

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

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

ENFORCEMENT

The 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 Commission Decision.

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

NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the 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 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 (7) 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 forty-eight (48) hours, followed by a written report filed within seven (7) 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 fourteen (14) days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

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

2. secure the attendance of appropriate 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 Commission shall have the authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction (Title 20, California Code of Regulations, sections 1232 - 1236).

POST CERTIFICATION CHANGES TO THE COMMISSION DECISION: AMENDMENTS, 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 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 (and 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 not 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

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

KEY EVENT LIST

PROJECT _____ DATE ENTERED

DOCKET # _____ PROJECT MANAGER

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

PASTORIA PREPARATION TEAM

Executive Summary.....Kae Lewis

Introduction.....Kae Lewis

Project Description.....Kae Lewis

Need Conformance

Air Quality.....Magdy Badar

Public Health.....Obed Odoemelam

Worker Safety and Fire Protection.....Kathi Hann

Transmission Line Safety and Nuisance.....Obed Odoemelam

Hazardous Materials Management .....Rick Tyler

Waste Management ..... Mike Ringer

Land Use.....Amanda Stennick

Traffic and Transportation ..... James Fore

Noise.....Thomas M. Murphy

Visual Resources..... Gary Walker

Cultural Resources.....Roberta S. Greenwood/Dorothy Torres

Socioeconomic Resources .....Joe Diamond/Dale Edwards

Biological Resources.....Rick York

Soil and Water Resources.....Lorraine White

Geology and Paleontology ..... Robert Anderson

Facility Design..... Steve Baker/Al McCuen/M. Kisabuli

Power Plant Reliability .....Steve Baker

Power Plant Efficiency.....Steve Baker

Transmission System Engineering .....Mark Hesters/Al McCuen

Alternatives..... Kae Lewis

Compliance Monitoring and Facility Closure .....Nancy Tronaas

Project Secretary.....Luz Manriquez and Sharee Knight