Preliminary Staff Assessment

PANOCHE ENERGY CENTER

Application For Certification (06-AFC-5)
Fresno County

CALIFORNIA ENERGY COMMISSION

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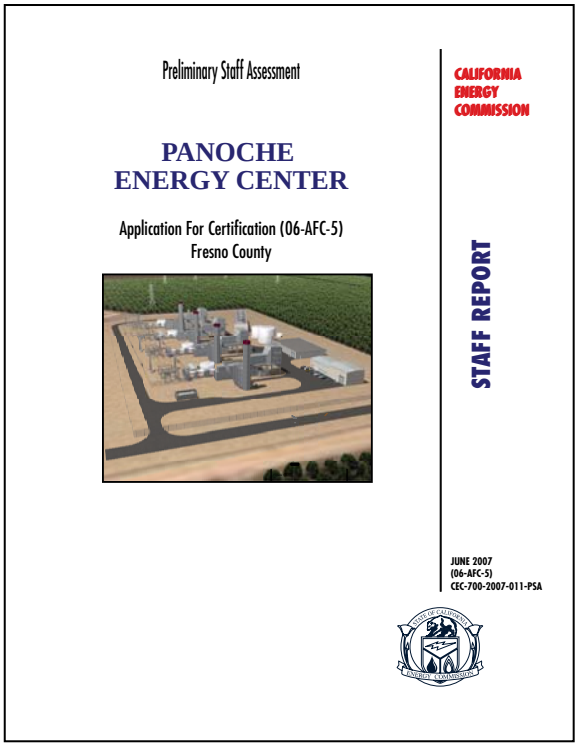

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PANOCHE ENERGY CENTER PROJECT
(06-AFC-5)
PRELIMINARY STAFF ASSESSMENT

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EXECUTIVE SUMMARY

James W. Reede, Jr., Ed.D

INTRODUCTION

This Preliminary Staff Assessment (PSA) contains the California Energy Commission (Energy Commission) staff's evaluation of Energy Investors Fund, LLC, (the Applicant) Application for Certification (AFC) (06-AFC-5) for the Panoche Energy Center (PEC). The proposed PEC electric generating plant and related facilities are under the Energy Commission's jurisdiction and cannot be constructed or operated without the Energy Commission's certification. This PSA examines engineering, environmental, public health and safety aspects of PEC, based on the information provided by the applicant and other sources available at the time the PSA was prepared. The PSA contains analyses similar to those normally contained in an Environmental Impact Report (EIR) required by the California Environmental Quality Act (CEQA). When issuing a license, the Energy Commission is the lead state agency under CEQA, and its process is functionally equivalent to the preparation of an EIR. After a 30-day public comment period on the PSA, staff will issue its testimony in the form of the Final Staff Assessment (FSA).

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

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

PROJECT LOCATION AND DESCRIPTION

The project area is located in an unincorporated area of western Fresno County, adjacent to the Panoche Hills. The site is approximately 12 miles southwest of the city of Mendota, 16 miles south-southwest of the city of Firebaugh and approximately 2 miles east of Interstate 5, adjacent to the Pacific Gas & Electric (PG&E) existing Panoche Substation. The proposed site and substation are located south of West Panoche Road. The site is more specifically described as the Southwest Quarter of Section 5, Township 15 South, Range 13 East, on the United States Geological Survey (USGS) Quadrangle map (Figure 3.2-1). The assessor's parcel number (APN) is 027-060-78S.

The facility site will be located on a 12.8-acre site within a 128-acre parcel. The construction laydown area, including laydown and parking, consists of an 8-acre portion of the 128-acre parcel immediately south of the 12.8-acre plant site. The plant site and construction area are leased by the applicant from the property owners. The 128-acre parcel is currently in agricultural production with pomegranate trees and is subject to a Williamson Act Contract. The landowner applied for partial cancellation of the Williamson Act Contract to cover the proposed site that was approved by the Fresno County Board of Supervisors on April 24, 2007. Offsite improvements associated with the project include a new 400-foot paved, 24-foot wide access road south of West Panoche Road to the plant site, 2,400 linear feet of new gas pipeline, and a new 300-foot transmission line to tie into the Panoche Substation. A project-related activity is PG&E's planned expansion of its Panoche Substation by approximately 2.2 acres south of the existing substation boundary.

The proposed PEC site is leased by Energy Investors Fund, LLC, and is adjacent to two existing peaking power plants and nearby the PG&E Panoche Substation. The two existing plants are known as the CalPeak Panoche and the Wellhead peaking power plants. Another power plant project, known as Starwood Midway, is proposed for construction immediately east of the PG&E Panoche Substation. The 120 MW Starwood Midway project application is being considered by the Energy Commission in a separate proceeding (06-AFC-10). The land surrounding these existing and proposed electric facilities is agricultural.

Project Description Figure 1 shows the regional setting and **Project Description Figure 2** shows the local setting of the proposed project.

The PEC would be a nominal 400 megawatt (MW) simple-cycle power plant consisting of four General Electric LMS100 natural gas-fired combustion turbine generators and associated equipment. The PEC is designed as a peaking facility to meet electric generation load during periods of high demand. The project is expected to have an annual capacity factor of approximately 57%. Auxiliary equipment will include inlet air foggers with evaporative coolers, a step up transformer, compressed air system, control enclosures, aqueous ammonia storage tank, natural gas fuel system, water treatment system, water storage tanks, wastewater system, site stormwater drainage system, and a lined evaporation pond.

Associated equipment will include emission control systems necessary to meet the proposed emission limits using best available control technology. Stack emission NO_x in normal operation will be controlled to 2.5 parts per million, volumetric dry (ppmvd) corrected to 15% oxygen through a combination of water injection in the combustors and operation of a selective catalytic reduction (SCR) system with 19% aqueous ammonia to further reduce NOx emissions, and an oxidation catalyst to reduce the emission of carbon monoxide (CO) and volatile organic compounds (VOCs).

Project Description Figure 3 shows the general arrangement and layout of the proposed facility. **Project Description Figure 4** provides an architectural rendering of the proposed facility.

The PEC will connect to the PG&E electrical transmission system at the adjacent Panoche Substation. The connection will require approximately 300 feet of new 230 kilovolt (kV) transmission line located within the plant site and PG&E's substation. Interconnection at this substation minimizes impacts to the PG&E transmission system while providing efficient peaking power for use during peak demand as projected by PG&E.

Natural gas will be delivered to the site via a new 2,400-foot high-pressure, lateral pipeline that would connect to a PG&E high-pressure gas trunk line located east of PG&E's electrical substation. This pipeline would connect with the project on the eastern side of the site at a new gas metering station. At the plant site, the natural gas will pass through a flow-metering station, gas scrubber/filtering equipment, gas pressure control station, electric-driven booster compressors (when required), and a fuel gas heater prior to entering the combustion turbines.

Process water for the cooling towers and other non-potable water uses are proposed to be supplied to the PEC from two new groundwater wells drilled onsite into the Westside Sub-basin of the San Joaquin Valley Groundwater Basin. These wells would draw water for cooling purposes, an industrial use, from what staff has determined to be a potable-water aquifer. This lower aquifer is also used for drinking water by the cities of Mendota and Firebaugh after normal state mandated filtration and chlorination.

These wells would also supply facility showers, sinks, toilets, eye wash stations, and safety showers. Unless the applicant properly filters the water, signs would be posted to alert personnel that water drawn from these wells is not for human consumption. Potable water would be supplied to the PEC by a bottled water service.

Process wastewater will be disposed of using a deep well injection system. The construction phase will have portable toilets with weekly servicing through pumping into tanker trucks. During the operational phase, sanitary wastes will be directed to a septic system and leach field designed to treat the sanitary flow from the administration and control building and restrooms.

PUBLIC AND AGENCY COORDINATION

On August 8, 2006, the Energy Commission Staff provided the AFC to a comprehensive list of libraries, agencies and organizations. Extensive coordination has occurred with the numerous local, state and federal agencies that have an interest in the project. Particularly, Energy Commission staff has worked with Fresno County's Planning Department and Public Works staffs, the cities of Mendota and Firebaugh, California Independent System Operator (CAISO), San Joaquin Valley Air Pollution Control District, California Air Resources Board, Central Valley Regional Water Quality Control Board, and the U.S. Environmental Protection Agency to identify and resolve issues of concern. In addition, staff has coordinated the review and analysis of the project with U.S. Fish and Wildlife Service, California Department of Fish and Game, U.S. Army Corp of Engineers, Native American tribes and other interested parties. Staff also contacted the local water agencies to ensure minimization of water usage and a clearer understanding of potential impacts.

A publicly noticed workshop will be conducted on this document during late July 2007. Information gathered during this workshop will be used to prepare the Final Staff Assessment (FSA). Additionally, responses to comments on the PSA will be included in the FSA.

ENVIRONMENTAL JUSTICE

Executive Order 12898, "Federal Actions to address Environmental Justice in Minority Populations and Low-Income Populations," focuses federal attention on the environment and human health conditions of minority communities and calls on federal agencies to achieve environmental justice as part of this mission. The order requires the U.S. Environmental Protection Agency (USEPA) and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

For all siting cases, Energy Commission staff conducts an environmental justice screening analysis in accordance with the "Final Guidance for Incorporating Environmental Justice Concerns in USEPA's National Environmental Policy Act (NEPA) Compliance Analysis" dated April 1998. The purpose of the screening analysis is to determine whether a minority or low-income population exists within the potentially affected area of the proposed site.

California Statute, Section 65040.12 (c) of the Government Code, defines "environmental justice" to mean "fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies." In light of the progress made by federal environmental agencies on environmental justice, the Energy Commission has examined federal guidelines pursuant to its desire to follow environmental justice principles for the environmental review of this project.

The steps recommended by these guidance documents to assure compliance with the Executive Order are: (1) outreach and involvement; (2) a screening-level analysis to determine the existence of a minority or low-income population; and (3) if warranted, a detailed examination of the distribution of impacts on segments of the population. Though the Federal Executive Order and guidance are not binding on the Energy Commission, staff finds these recommendations helpful for implementing this environmental justice analysis. Staff has followed each of the above steps for the following 11 sections in the PSA: Air Quality, Hazardous Materials, Land Use, Noise, Public Health, Socioeconomics, Soils and Water, Traffic and Transportation, Transmission Line Safety/Nuisance, Visual Resources, and Waste Management.
The purpose of the environmental justice screening analysis is to determine whether a low-income and/or minority population exists within the potentially affected area of the proposed site. Staff conducted the screening analysis in accordance with the "Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis" (Guidance Document) dated April 1998. People of color populations, as defined by this Guidance Document, are identified where either:

- the minority population of the affected area is greater than 50% of the affected area's general population; or
- the minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

There are 33 people living within one mile of the site, 100% are minority. The 2000 Census found that there are only 464 people within six miles of the site of which 454 or 97.8% are minority. The low income population identified within that area is 23.5%.

OUTREACH

The Commission held an Informational Hearing and Site Visit for the PEC on December 12, 2006. In preparation for that event, the Public Adviser's Office had 1,000 flyers placed in local newspapers to notify the public of the upcoming hearing. The hearing was held in the nearby city of Mendota to facilitate public involvement. Additionally, publicly noticed workshops were conducted related to this proposed project on January 31, 2007 in Mendota and April 13, 2007 at the Energy Commission to discuss data requests and data responses.

STAFF'S ASSESSMENT

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

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

Staff has prepared its preliminary analyses and has made preliminary recommendations for all technical areas.

SUMMARY OF PROJECT RELATED IMPACTS

The project as proposed will have significant direct, indirect, and cumulative environmental impacts on water resources. However, staff believes that with implementation of the applicant's and the staff's proposed mitigation measures and the staff's proposed conditions of certification, the PEC would comply with all applicable laws, ordinances, regulations, and standards (LORS), and that significant adverse direct, indirect, and cumulative impacts will not occur. For a more detailed review of potential impacts, see staff's technical analyses in the PSA. The status of each technical area is summarized in the table below. The discussion following the table identifies the items necessary for completion of the FSA and provides a discussion of associated issues.

Technical Area	Complies with LORS	Impacts Mitigated
Air Quality	Yes	Yes
Biological Resources	Yes	Yes
Cultural Resources	Yes	Yes
Efficiency	N/A	N/A
Facility Design	Yes	Yes
Geology & Paleontology	Yes	Yes
Hazardous Materials	Yes	Yes
Land Use	No	Yes
Noise	Yes	Yes
Public Health	Yes	Yes
Reliability	Yes	Yes
Socioeconomic Resources	Yes	Yes
Soil & Water Resources	No	No
Traffic & Transportation	Yes	Yes
Transmission Line Safety/Nuisance	Yes	Yes
Transmission System Engineering	Yes	Yes
Visual Resources	Yes	Yes
Waste Management	Yes	Yes
Worker Safety and Fire Protection	Yes	Yes

CONCLUSIONS AND RECOMMENDATIONS

The PSA is a document of the Energy Commission staff so, by its very nature, the conclusions and recommendations presented are considered staff's initial analysis of the project.

Each technical area assessment in the PSA includes a discussion of the project and the existing environmental setting; the project's conformance with laws, ordinances, regulations and standards (LORS); whether the facility can be constructed and operated safely and reliably; project specific direct and cumulative impacts; the environmental

consequences of the project using the proposed mitigation measures; conclusions and recommendations; and any proposed conditions of certification under which the project should be constructed and operated, should it be approved.

In summary this PSA finds that:

- The project is in conformance with all Laws, Ordinances, Regulations and Standards (LORS) with the exception of land use consistency with the Fresno County General Plan zoning and proposed water supply consistency with State Water policy 75-58.
- Staff is unable to conclude that the proposed project is consistent with the Fresno County General Plan for industrial uses on a parcel that is zoned Exclusive Agriculture AE-20. Staff will continue to work with the Fresno County Planning staff to resolve this issue.
- The project as proposed will have significant direct, indirect, and cumulative environmental impacts on water resources. Staff has determined that there appears to be feasible alternatives that would avoid or minimize the significant impacts. The applicant has not yet agreed to implementation of any of the avoidance or minimization alternatives. These impacts will be further addressed in the FSA.
- With the proposed conditions of certification included in the various technical areas, the project's construction and operation impacts can be mitigated to a level less than significant.
- The San Joaquin Valley Air Pollution Control District has determined that the project complies with the appropriate rules and requirements of the District and will not contribute to the degradation of the air quality. The applicant has identified all required emissions reductions credits needed for operation of the proposed project.
- Transmission system impacts and appropriate mitigation have been fully identified at this point. When staff has the related evaluation by the CAISO, the additional information will be analyzed and discussed in the FSA.

INTRODUCTION

James W. Reede, Jr., Ed.D

PURPOSE OF THIS REPORT

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

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

The 19 technical area analyses contained in this PSA are based upon information from: 1) the AFC; 2) subsequent submittals; 3) responses to data requests; 4) supplementary information from local and state agencies, intervenors, and interested individuals; 5) existing documents and publications; and 6) independent field studies and research. The analyses for most technical areas include discussions of proposed conditions of certification. Each proposed condition of certification is followed by a proposed means of "verification." The verification is not part of the proposed condition, but is the Energy Commission Compliance Unit's method of ensuring post-certification compliance with adopted requirements.

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

ORGANIZATION OF THE STAFF ASSESSMENT

The PSA contains an Executive Summary, Introduction, Project Description, and Project Alternatives. The environmental, engineering, and public health and safety analysis of

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

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

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

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, §25500). The Energy Commission must review power plant AFCs to assess potential environmental and public health and safety impacts, potential measures to mitigate those impacts (Pub. Resources Code, §25519), and compliance with applicable governmental laws and standards (Pub. Resources Code, §25523 (d)).

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

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

Staff conducts its environmental analysis in accordance with the requirements of CEQA. No Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been certified as a certified regulatory program by the

Resources Agency (Pub. Resources Code, §21080.5 and Cal. Code Regs., tit. 14, §15251(k)). The Energy Commission acts as the CEQA lead agency and is subject to all other applicable portions of CEQA.

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

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

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

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

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

Agency Coordination

As noted above, the Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, § 25500). However, the Commission typically seeks comments from, and works closely with, other regulatory agencies that administer LORS that may be applicable to proposed projects. These agencies include the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, California Department of Fish and Game, San Joaquin Valley Air Pollution Control District, and the California Air Resources Board.

PROJECT DESCRIPTION

James W. Reede, Jr., Ed.D

INTRODUCTION

On August 2, 2006, Energy Investors Fund, LLC, (Applicant) submitted an Application for Certification (AFC) to construct and operate a nominal 400 megawatt (MW), simple-cycle power plant, the Panoche Energy Center (PEC), in an unincorporated area of western Fresno County.

The applicant submitted a final AFC Supplement on November 7, 2006, and on November 8, 2006, the Energy Commission accepted the AFC (06-AFC-5) with supplemental information as complete. This determination initiated Energy Commission staff's independent analysis of the proposed project.

PURPOSE OF PROJECT

The PEC is designed as a peaking facility to meet electrical generation loads during period of high demand, which generally occur during the daytime hours, and more frequently during the summer than other times of the year. The project is expected to have an annual capacity factor of no higher than 57%, depending on weather and customer demand, load growth, hydroelectric supplies, generation retirements and replacements, the level of generating unit and transmission outages, and other factors.

The proposed project objectives are based on the terms and conditions set forth in a Power Purchase Agreement (PPA) between the applicant and Pacific Gas and Electric Company (PG&E). (PEC 2006a) These terms and conditions include:

- Power supply contract term of 20 years.
- The PEC would be constructed on a parcel of land adjacent to the PG&E Panoche Substation on West Panoche Road, Fresno County, California.
- The generating facility will include four General Electric LMS100 natural gas-fired combustion turbine generators (CTGs). The four turbines are able to ramp from zero (0) percent to 100 percent load in a fairly short time and they provide an attractive heat rate for a peaking plant.
- Each CTG will generate 100 MW net at summer design ambient conditions.
- The entire PEC is to be on-line and available for PG&E to dispatch into the grid on or before August 1, 2009.
- As an intermediate load and peaking facility, the plant is estimated to operate no more than 5,000 hours per year. The plant will be dispatched by PG&E in accordance with their economic dispatch procedures

PROJECT LOCATION

The project area is located in an unincorporated area of western Fresno County, adjacent to the Panoche Hills. The site is approximately 12 miles southwest of the city

of Mendota, 16 miles south-southwest of the city of Firebaugh and approximately 2 miles east of Interstate 5, adjacent to the Pacific Gas & Electric (PG&E) existing Panoche Substation. The proposed site and substation are located south of West Panoche Road. The site is more specifically described as the Southwest Quarter of Section 5, Township 15 South, Range 13 East, on the United States Geological Survey (USGS) Quadrangle map (Figure 3.2-1). The assessor's parcel number (APN) is 027-060-78S.

The facility site will be located on a 12.8-acre site within a 128-acre parcel. The construction laydown area, including laydown and parking, consists of an 8-acre portion of the 128-acre parcel immediately south of the 12.8-acre plant site. The plant site and construction area are leased by the applicant from the property owners. The 128-acre parcel is currently in agricultural production with pomegranate trees and is subject to a Williamson Act Contract. The landowner applied for partial cancellation of the Williamson Act Contract to cover the proposed project site. The cancellation was approved by the Fresno County Board of Supervisors on April 24, 2007. Offsite improvements associated with the project include a new 400-foot paved, 24-foot wide access road south of West Panoche Road to the plant site, 2,400 linear feet of new gas pipeline, and a 300-foot transmission tieline into the Panoche Substation. A project-related activity is PG&E's planned expansion of its Panoche Substation by approximately 2.2 acres south of the existing substation boundary.

The proposed PEC site is leased by Energy Investors Fund, LLC, and is adjacent to two existing peaking power plants and nearby the PG&E Panoche Substation. The two existing plants are known as the CalPeak Panoche and the Wellhead peaking power plants. Another power plant project, currently under review by the Energy Commission as 06-AFC-10, known as Starwood Midway, is proposed for construction immediately east of the PG&E Panoche Substation. The land surrounding these existing and proposed electric facilities is agricultural.

Project Description Figure 1 shows the regional setting and **Project Description Figure 2** shows the local setting of the proposed project.

POWER PLANT EQUIPMENT AND LINEAR FACILITIES

The PEC would be a nominal 400 megawatt (MW) simple-cycle power plant consisting of four General Electric LMS100 natural gas-fired combustion turbine generators and associated equipment. The PEC is designed as a peaking facility to meet electric generation load during periods of high demand. The project is expected to have an annual capacity factor of approximately 57%.

Auxiliary equipment will include inlet air foggers with evaporative coolers, a step up transformer, compressed air system, control enclosures, aqueous ammonia storage tank, natural gas fuel system, water treatment system, water storage tanks, wastewater system, site stormwater drainage system, and a lined evaporation pond.

Associated equipment will include emission control systems necessary to meet the proposed emission limits using best available control technology. Stack emission NO_x in normal operation will be controlled to 2.5 parts per million, volumetric dry (ppmvd)

corrected to 15% oxygen through a combination of water injection in the combustors and operation of a selective catalytic reduction (SCR) system with 19% aqueous ammonia to further reduce NOx emissions, and an oxidation catalyst to reduce the emission of carbon monoxide (CO) and volatile organic compounds (VOCs).

Project Description Figure 3 shows the general arrangement and layout of the proposed facility. **Project Description Figure 4** provides an architectural rendering of the proposed facility.

ELECTRIC TRANSMISSION

The PEC will connect to the PG&E electrical transmission system at the adjacent Panoche Substation. The connection will require approximately 300 feet of new 230 kilovolt (kV) transmission line located within the plant site and PG&E's substation.

NATURAL GAS SUPPLY

Natural gas will be delivered to the site via a new 2,400-foot high-pressure, lateral pipeline that would connect to a PG&E high-pressure gas trunk line located east of PG&E's electrical substation. This pipeline would connect with the project on the eastern side of the site at a new gas metering station. At the plant site, the natural gas will pass through a flow-metering station, gas scrubber/filtering equipment, gas pressure control station, electric-driven booster compressors (when required), and a fuel gas heater prior to entering the combustion turbines.

WATER SUPPLY

Process water for the cooling towers and other non-potable water uses are proposed to be supplied to the PEC from two new groundwater wells drilled onsite into the Westside Sub-basin of the San Joaquin Valley Groundwater Basin. These wells would draw water from a freshwater aquifer. These wells would also supply facility showers, sinks, toilets, eye wash stations, and safety showers. Signs would be posted to alert personnel that water drawn from these wells is not for human consumption. Potable water would be supplied to the PEC by a bottled water service.

WASTEWATER DISCHARGE

Process wastewater will be disposed of using a deep well injection system. The construction phase will have portable toilets with weekly servicing. During the operational phase, sanitary wastes will be directed to a septic system and leach field designed to treat the sanitary flow from the administration and control building and restrooms.

PROJECT CONSTRUCTION AND OPERATION

If approved by the Energy Commission, the applicant proposes to initiate construction of the PEC in Winter 2007-2008. The major construction schedule milestones are listed below.

Activity	Date
Begin Construction	January 2008
Startup and Test	June 2009
Commercial Operation	August 2009

There will be an average monthly and peak monthly workforce of approximately 150 and 364, respectively, of construction craft people, supervisory, support, and construction management personnel onsite during construction.

Construction will most typically take place between the hours of 6 a.m. and 6 p.m., Monday through Saturday. Additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities. During some construction periods and during the startup phase of the project, some activities will continue 24 hours per day, seven days per week.

The peak construction site workforce level is expected to last from Month 7 through Month 11 of the construction period following commencement of construction.

FACILITY CLOSURE

Facility closure can be either temporary or permanent. Facility closure can result from two circumstances: 1) the facility is closed suddenly and/or unexpectedly due to unplanned circumstances, such as a natural disaster or other unexpected event (e.g., a temporary shortage of facility fuel); or 2) the facility is closed in a planned, orderly manner, such as at the end of its useful economic or mechanical life or due to gradual obsolescence. The two types of closure are discussed in the following sections.

Temporary Closure

Temporary or unplanned closure can result from a number of unforeseen circumstances, ranging from natural disaster to economic forces. For a short term unplanned closure, where there is no facility damage resulting in a hazardous substance release, the facility would be kept “as is,” ready to resume operating when the unplanned closure event is rectified or ceases to restrict operations.

In the event that there is a possibility of a hazardous substances release, the project owner will notify the CEC compliance unit and follow emergency plans that are appropriate to the emergency Risk Management Plan (RMP). Depending upon the expected duration of the shutdown, chemicals may be drained from the storage tanks and other equipment. All waste (hazardous and non-hazardous) will be disposed of

according to LORS in effect at the time of the closure. Facility security will be retained so that the facility is secure from trespassers.

Permanent Closure

The anticipated life of the generation facility is 30 years. However, if the facility were economically viable at the end of the 30-year operating period, it could continue to operate for a much longer period of time. As power plant operators continuously upgrade their generation equipment, and maintain the equipment up to industry standards, there is every expectation that the generation facility will have value beyond its expected life.

Closure Mitigation

At the time of facility closure, decommissioning will be completed in a manner that: 1) protects the health and safety of the public; and, 2) is environmentally acceptable. One year prior to a planned closure, the project owner will submit to the CEC a specific decommissioning plan that would include the following:

1. Identification, discussion, and scheduling of the proposed decommissioning activities to include the power plant, applicable transmission lines, and other pertinent facilities constructed as part of the project.

2. Description of the measures to be taken that will ensure the safe shutdown and decommissioning of all equipment, including the draining and cleaning of all tankage, and the removal of any hazardous waste.

3. Identification of all applicable LORS in effect at the time, and how the specific decommissioning will be accomplished in accordance with the LORS.

4. Notification of state and local agencies, including the CEC.

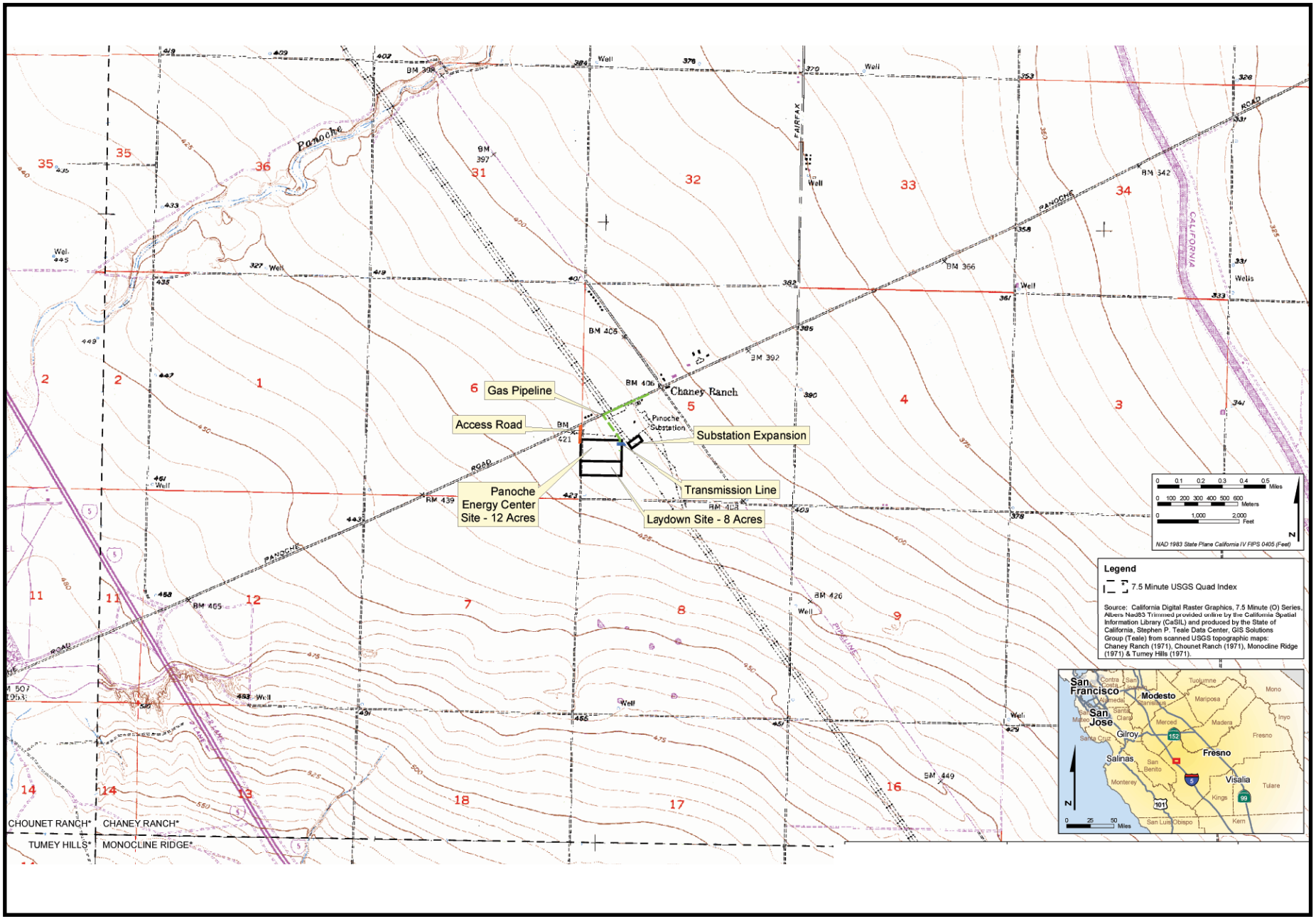
5. Once land is used for industrial or commercial purposes, it rarely reverts back to its natural state. Reuse of the land will be encouraged in this case, as opposed to taking additional land for future industrial or commercial purposes. If the plant site is to return to its natural state, the specific decommissioning plan will include the removal of all aboveground and underground objects and material, and an erosion control plan that is consistent with sound land management practices.

In the event of an unplanned closure due to earthquake damage or other circumstances, the project owner will meet with the CEC and local agencies and submit a detailed decommissioning closure plan in a timely manner.

No decommissioning plan will be submitted for a temporary shutdown.

PROJECT DESCRIPTION - FIGURE 1

Panoche Energy Center Project - Regional Setting of Project

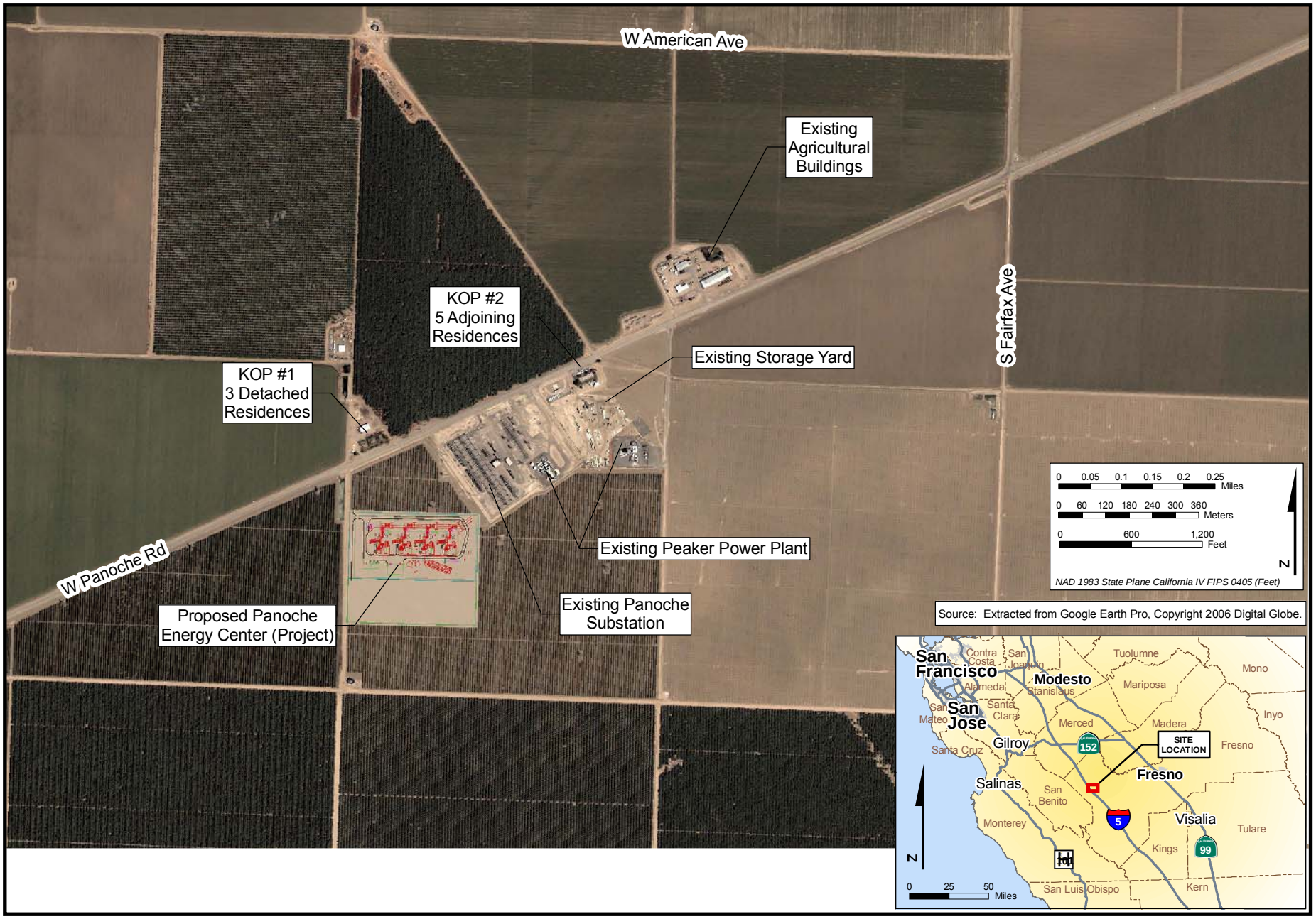


CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: AFC Figure 3.2 -1

PROJECT DESCRIPTION - FIGURE 2

Panoche Energy Center Project - Local Setting of Project

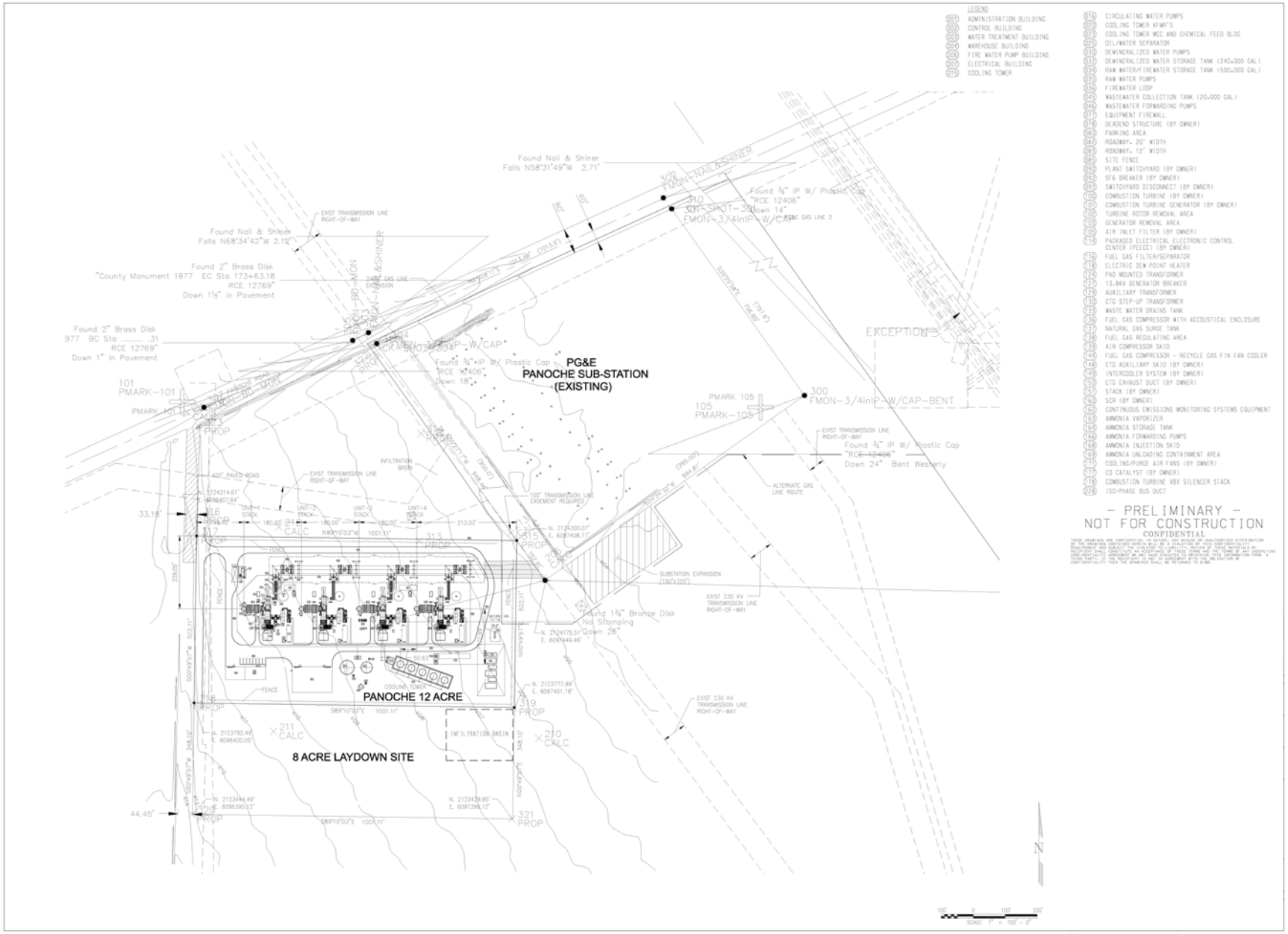


CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: AFC Figure 5.13 -5

PROJECT DESCRIPTION - FIGURE 3

Panoche Energy Center Project - General Arrangement and Layout of Facility

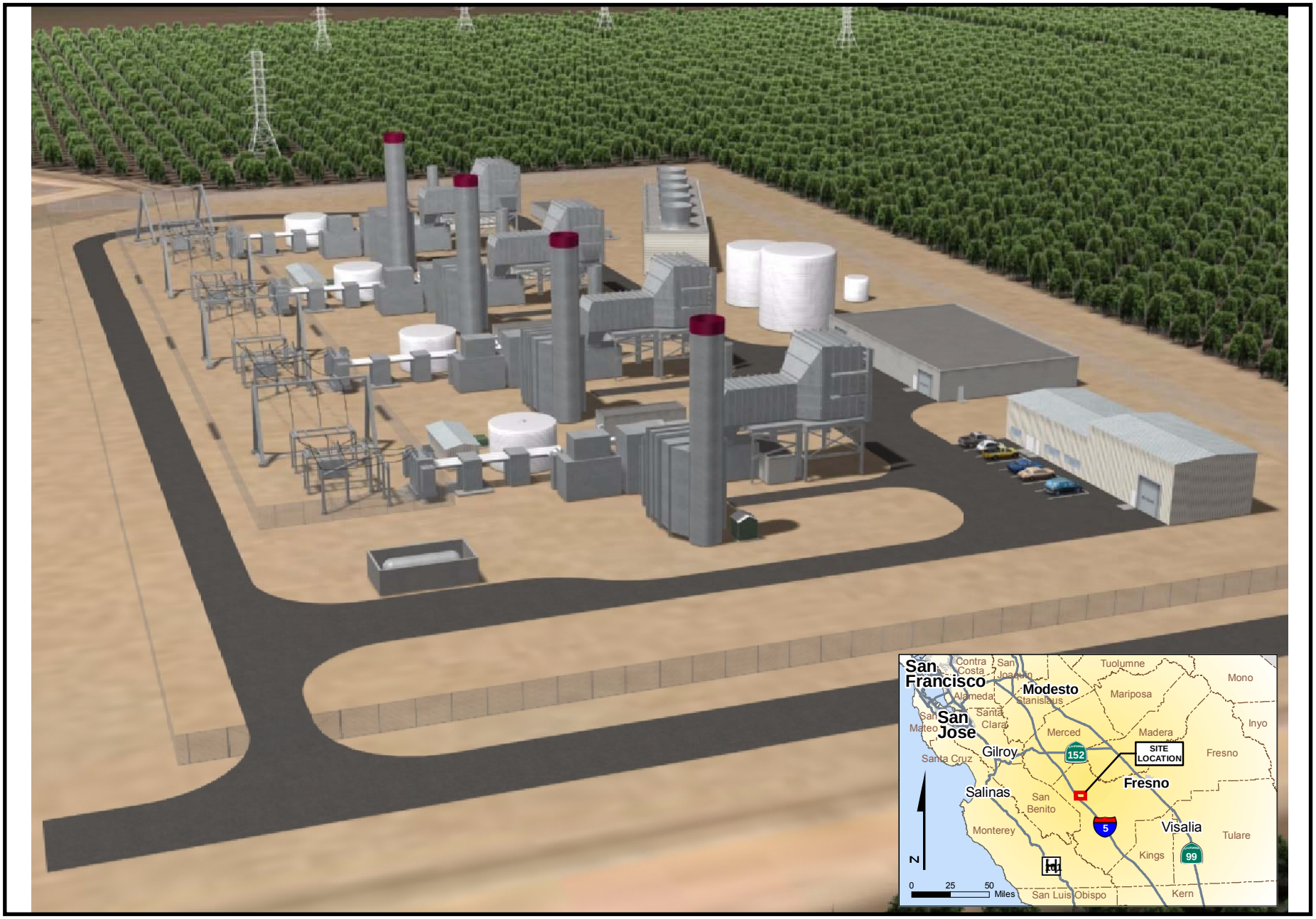


CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: AFC Figure 3.4 - 1

PROJECT DESCRIPTION - FIGURE 4

Panoche Energy Center Project - Artist Rendering of Proposed Facility



CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: AFC Figure 1.3 - 1

ENVIRONMENTAL ASSESSMENT

AIR QUALITY

William Walters and Lisa Blewitt

SUMMARY OF CONCLUSIONS

Staff's analysis indicates that the Panoche Energy Center (PEC) Project should comply with all applicable Laws, Ordinances, Regulations, and Standards (LORS) and should not result in significant air quality impacts. The project has secured emission reduction credits (ERCs) in sufficient quantity to meet San Joaquin Valley Air Pollution Control District (SJVAPCD or District) requirements and to fully offset all nonattainment pollutants and their precursors at a minimum ratio of 1:1.

Staff has assessed both the potential for localized impacts and regional impacts for the project's construction and operation, and as a product of this analysis staff has recommended mitigation and monitoring requirements that should provide adequate mitigation and monitoring sufficient to reduce the adverse construction and operating emission impacts to less than significant.

Staff does have comments on the District's Preliminary Determination of Compliance (PDOC) permit conditions regarding emission totals and equipment specifications that will need to be resolved prior to completion of the Final Staff Assessment.

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 Panoche Energy Center (PEC) by Panoche Energy Center, LLC (applicant). The PEC will be located adjacent to the Panoche Hills, east of the San Benito County line, in the unincorporated area of western Fresno County, approximately 50 miles west of the City of Fresno and approximately two miles east of Interstate 5 just south of Panoche Road.

Criteria air pollutants are defined as those air contaminants for which the state and/or federal government has established an ambient air quality standard to protect public health. The criteria pollutants analyzed are nitrogen dioxide (NO_2), sulfur dioxide (SO_2), CO, ozone (O_3), PM10, and PM2.5. In addition, VOC emissions are analyzed because they are precursors to both O_3 and particulate matter. Because NO_2 and SO_2 readily react in the atmosphere to form other oxides of nitrogen and sulfur respectively, the terms nitrogen oxides (NOx) and sulfur oxides (SOx) are also used when discussing these two pollutants. Non-criteria pollutants, also known as "Air Toxics," are discussed in the **PUBLIC HEALTH** section of this PSA.

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

- Whether the PEC is likely to conform with applicable Federal, State and San Joaquin Valley Air Pollution Control District (SJVAPCD or District) air quality laws, ordinances, regulations and standards (Title 20, California Code of Regulations, section 1744 (b));

- Whether the PEC is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards (Title 20, California Code of Regulations, section 1742 (b)); and
- Whether the mitigation proposed for the PEC is adequate to lessen the potential impacts to a level of insignificance (Title 20, California Code of Regulations, section 1742 (b)).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal, state, and local laws and policies pertain to the control of criteria pollutant emissions and mitigation of air quality impacts. Staff's analysis examines the project's compliance with these requirements.

AIR QUALITY Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
40 Code of Federal Regulations (CFR) 52	Nonattainment New Source Review (NSR) requires a permit and requires Best Available Control Technology (BACT) and Offsets. Permitting and enforcement delegated to SJVAPCD. Prevention of Significant Deterioration (PSD) requires major sources to obtain permits for attainment pollutants. A major source for a simple-cycle combustion turbine is defined as any one pollutant exceeding 250 tons per year. Since the emissions from the PEC are not expected to exceed 250 tons per year, PSD does not apply.
40 CFR 60 Subpart KKKK	New Source Performance Standard for gas turbines: 15 parts per million (ppm) NOx at 15%O_2 and fuel sulfur limit of 0.060 lb SOx per million Btu heat input. BACT will be more restrictive. Enforcement delegated to SJVAPCD.
40 CFR Part 70	Title V: Federal permit. Title V permit application required within one year of start of operation. Permitting and enforcement delegated to SJVAPCD.
40 CFR Part 72	Acid Rain Program. Requires permit and obtaining sulfur oxides credits. Permitting and enforcement delegated to SJVAPCD.

State	
Health and Safety Code (HSC) Section 40910-40930	Permitting of source needs to be consistent with approved Clean Air Plan.
HSC Section 41700	Restricts emissions that would cause nuisance or injury.

Local – San Joaquin Valley Air Pollution Control District (SJVAPCD)	
Regulation I – General Provisions	This regulation sets forth requirements and standards for stack monitoring, source sampling, and breakdown events.

Local – San Joaquin Valley Air Pollution Control District (SJVAPCD)	
Regulation II – Permits	This regulation sets forth the regulatory framework of the application for and issuance of construction and operation permits for new, altered and existing equipment. Included in these requirements are the federally delegated requirements for New Source Review, Title V Permits, and the Acid Rain Program. Regulation II Rule 2201 establishes the pre-construction review requirements for new, modified or relocated facilities, in conformance with the federal New Source Review regulation to ensure that these facilities do not interfere with progress in attainment of the national ambient air quality standards and that future economic growth in the San Joaquin Valley is not unnecessarily restricted. This regulation establishes Best Available Control Technology (BACT) and emission offset requirements. Regulation II, Rule 2520 defines the permit application and issuance as well as compliance requirements associated with the Title V federal permit program. Any new source which qualifies as a Title V facility must obtain a Title V permit within twelve months of starting operation modification of that source. Regulation II, Rule 2540 defines the requirements for the Acid Rain Program, including the requirement for a subject facility to obtain emission allowances for SOx emissions as well as monitoring SOx, NOx, and carbon dioxide (CO_2) emissions from the facility.
Regulation IV – Prohibitions	This regulation sets forth the restrictions for visible emissions, odor nuisance, various air emissions, and fuel contaminants. Regulation IV incorporates provisions of 40 CFR Part 60, Chapter I, and is applicable to all new, modified, or reconstructed sources of air pollution. Sections of this regulation apply to stationary gas turbines (Subpart KKKK). These subparts establish limits of NO_2 and SO_2 emissions from the facility as well as monitoring and test method requirements. Also specifies additional performance standards for stationary gas turbines, and specifies performance standards for stationary internal combustion engines larger than 50 brake horse power (bhp).
Regulation V – Procedures before the Hearing Board	Establishes the procedures for reporting emergencies and emergency variances.
Regulation VIII – Fugitive PM10 Prohibitions	This regulation sets forth the requirements and performance standards for the control of emissions from fugitive dust causing activities.

SETTING

The PEF site is located in an unincorporated area of western Fresno County east of the Panoche Hills and east of the San Benito County line approximately 2.2 miles east of Interstate 5 and 50 miles west of the City of Fresno. The nearest current rural residence is within 550 feet (170 meters) north of the site's northwest corner fence line. Land use within 10 miles of the site is primarily dedicated to the cultivation of agricultural crops

(PEC 2006a, p. 5.2-2). The proposed site is part of a 128-acre parcel currently in agricultural production with pomegranate trees (PEC 2006a, p. 3-2).

The population density surrounding the site is low with less than 500 persons residing within a 6-mile radius of the site, with the minority population making up over 95 % of the total population within six miles of the site (**Socioeconomics Figure 1**). Staff has considered the minority populations in the site area in the project's impact analysis.

METEOROLOGICAL CONDITIONS

The climate of the San Joaquin Valley is controlled by a semi-permanent subtropical high-pressure system that is located off the Pacific Ocean. In the summer, this strong high-pressure system results in clear skies, high temperatures, and low humidity. Very little precipitation occurs during the summer months because storms are blocked by the high-pressure system. Beginning in the fall and continuing through the winter, the high pressure weakens and moves south, allowing storm systems to move through the area. Temperature, winds, and rainfall are more variable during these months, and stagnant conditions occur more frequently than during summer months. Weather patterns include periods of stormy weather with rain and gusty winds, clear weather that can occur after a storm, or persistent fog. The project site, as determined using nearby Mendota, receives an average of 12 inches of rain annually (WC 2007).

Temperature, wind speed, and wind direction data collected in Fresno at the Yosemite International Airport were provided for reference by the applicant (PEC 2006a, Appendix I – Quarterly Wind Roses). The predominant annual wind direction from this monitoring site is from the northwest. The northwest wind direction is particularly predominating during the spring, summer, and autumn. The winds during the winter show two predominating directions, from the northwest and from the southeast (i.e. up and down valley directions). The wind speeds are generally higher during daylight hours, and higher during the spring and summer, and lower in fall and winter. Staff's review of monitoring data closer to the western side of the San Joaquin Valley, from the Lemoore Naval Air Station, indicates that the site area would generally have the same predominant wind directions.

Along with the wind flow, atmospheric stability and mixing heights are important factors in the determination of pollutant dispersion. Atmospheric stability reflects the amount of atmospheric turbulence and mixing. In general, the less stable an atmosphere, the greater the turbulence, which results in more mixing and better dispersion. The mixing height, measured from the ground upward, is the height of the atmospheric layer in which convection and mechanical turbulence promote mixing. Good ventilation results from a high mixing height and at least moderate wind speeds with the mixing layer. In general, mixing is more limited at night and in the winter in the San Joaquin Valley when there is a higher potential for lower level inversion layers being present along with low surface winds.

EXISTING AIR QUALITY

The project is located within the jurisdiction of the San Joaquin Valley Air Pollution Control District (District). The applicable federal and California ambient air quality standards (AAQS) are presented in **Air Quality Table 2**. As indicated in this table, the

averaging times for the various air quality standards (the duration over which they are measured) range from one-hour to annual average. The standards are read as a mass fraction, in parts per million (ppm), or as a concentration, in milligrams or micrograms of pollutant per cubic meter of air (mg/m^3 or µg/m^3).

AIR QUALITY Table 2
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	8 Hour	0.08 ppm (157 µg/m^3)	0.070 ppm (137 µg/m^3)
	1 Hour	—	0.09 ppm (180 µg/m^3)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9.0 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.053 ppm (100 µg/m^3)	— [a]
	1 Hour	—	0.25 ppm (470 µg/m^3) [a]
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	0.030 ppm (80 µg/m^3)	—
	24 Hour	0.14 ppm (365 µg/m^3)	0.04 ppm (105 µg/m^3)
	3 Hour	0.5 ppm (1300 µg/m^3)	—
	1 Hour	—	0.25 ppm (655 µg/m^3)
Respirable Particulate Matter (PM10)	Annual Arithmetic Mean	—	20 µg/m^3
	24 Hour	150 µg/m^3	50 µg/m^3
Fine Particulate Matter (PM2.5)	Annual Arithmetic Mean	15 µg/m^3	12 µg/m^3
	24 Hour	35 µg/m^3	—
Sulfates (SO_4)	24 Hour	—	25 µg/m^3
Lead	30 Day Average	—	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	—
Hydrogen Sulfide (H_2S)	1 Hour	—	0.03 ppm (42 µg/m^3)
Vinyl Chloride (chloroethene)	24 Hour	—	0.01 ppm (26 µg/m^3)
Visibility Reducing Particulates	8 Hour	—	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%.

Source: ARB 2007a.
[a] ARB has approved a revised 1-hour standard for NO_2 (0.18 ppm or 338 ug/m^3) and a new annual standard for NO_2 (0.030 ppm or 56 ug/m^3) ; however, these standards have not completed the state's official approval process at the time of the completion of the PSA and are not expected to be officially approved prior to the completion of the FSA.

The U.S. Environmental Protection Agency (U.S. EPA), California Air Resource Board (ARB), and the local air district classify an area as attainment, unclassified, or nonattainment, depending on whether or not the monitored ambient air quality data show compliance, insufficient data is available, or non-compliance with the ambient air quality standards, respectively. The PEC is located within the San Joaquin Valley Air Basin (SJVAB) and, as stated above, is under the jurisdiction of the San Joaquin Valley Air Pollution Control District. This area is designated as nonattainment for both the federal and state ozone and PM10 standards. **Air Quality Table 3** summarizes federal and state attainment status of criteria pollutants for the SJVAB.

AIR QUALITY Table 3
Federal and State Attainment Status for the San Joaquin Valley Air Basin

Pollutant	Attainment Status	
	Federal	State
Ozone	Serious Nonattainment (8-hr)	Severe Nonattainment (1-hr)
PM10	Serious Nonattainment	Nonattainment
PM2.5	Nonattainment	Nonattainment
CO	Unclassified/Attainment [a]	Attainment
NO_2	Unclassified/Attainment [a]	Attainment
SO_2	Attainment	Attainment

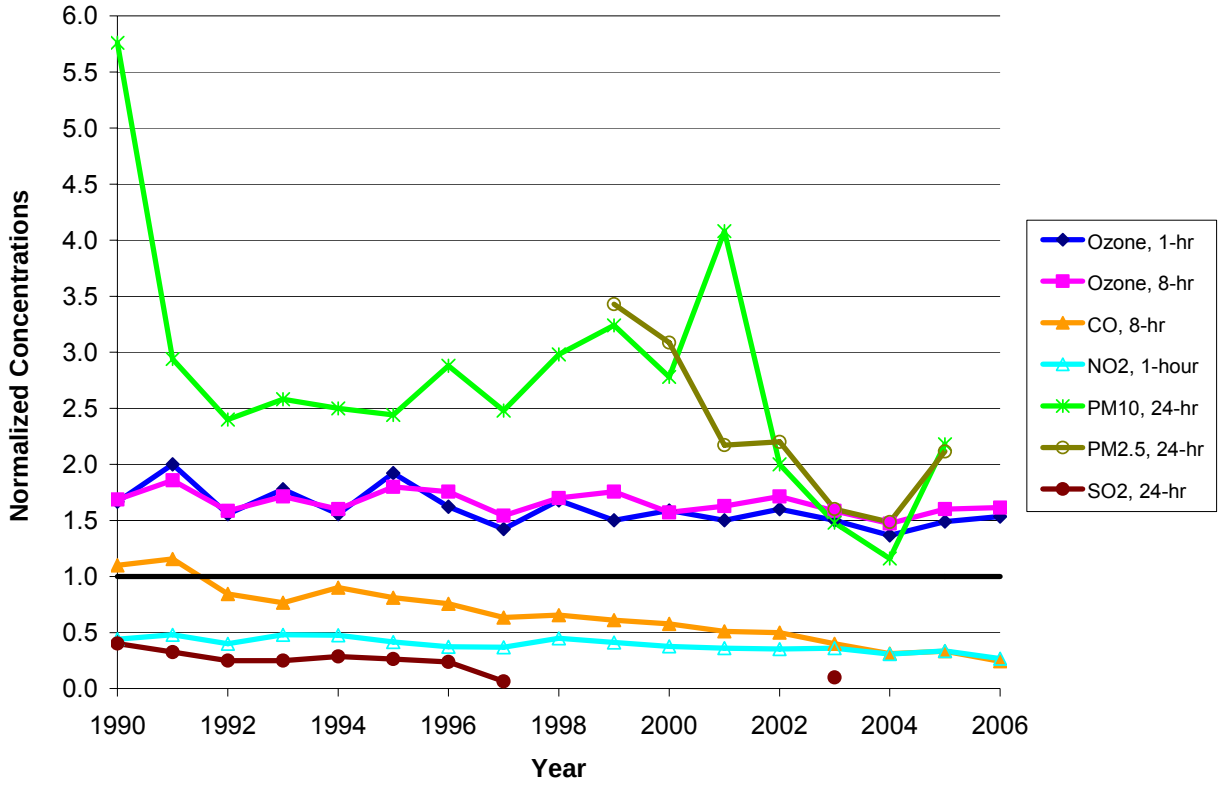
Source: ARB 2007b, USEPA 2007.
[a] Unclassified/Attainment – The attainment status for the subject pollutant is classified as either attainment or unclassified.

The project site is in Fresno County, about 50 miles (80 kilometers [km]) west of the City of Fresno, 2.2 miles (3.5 km) east of Interstate 5 (I-5) and approximately 3 miles (5.0 km) west of the California Aqueduct, southeast of the intersection of West Panoche Road and Davidson Avenue, off the alignment of Davidson Avenue. The project site abuts the existing Pacific Gas & Electric (PG&E) substation on the west.

The monitoring station closest to the proposed project site with a long-term record of all the criteria pollutants, except SO_2, is the Fresno First Street Station, located at 3425 North First Street, approximately 46 miles east of the project site. This station monitors ambient concentrations of lead, ozone, NO_2, CO, PM10, and PM2.5. The Fresno Fremont School Station is the closest station that monitors SO_2. To the extent that monitoring data from the Fresno stations have been used to characterize conditions at the project site, this practice would generally overestimate existing pollutant levels at PEC because of the much lower population and level of development of this area compared to the monitoring stations in the urban areas of Fresno.

Air Quality Figure 1 summarizes the historical air quality data for the project location, recorded at the Fresno Olive Street (1986-1989 for ozone, CO, NO_2, PM10, SO_2), Fresno First Street (1990-2006 for ozone, CO, NO_2, PM10, SO_2; 1999-2006 for PM2.5; 1990-1997 for SO_2), and Fresno Fremont School (2003 for SO_2) air monitoring stations. In **Air Quality Figure 1**, the short term normalized concentrations are provided from 1986 to 2006. Normalized concentrations represent the ratio of the highest measured concentrations in a given year to the most-stringent applicable national or state ambient air quality standard. Therefore, normalized concentrations lower than one indicate that the measured concentrations were lower than the most-stringent ambient air quality standard.

AIR QUALITY Figure 1
Normalized Maximum Short-Term Historical Air Pollutant Concentrations
Fresno First Street (1990-2006), and Fresno Fremont School (2003 - SO_2 only)



Source: ARB 2006a, ARB 2007c.

A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. For example, in 1999 the highest one-hour average ozone concentration measured at the Fresno First Street station was 0.135 ppm. Since the most stringent ambient air quality standard is the state standard of 0.09 ppm, the 1999 normalized concentration is 0.135/0.09 = 1.5.

Following is a more in-depth discussion of ambient air quality conditions in the project area.

Ozone

In the presence of ultraviolet radiation, both nitrogen oxides (NOx) and volatile organic compounds (VOC) go through a number of complex chemical reactions to form ozone. **Air Quality Table 4** summarizes the best representative ambient ozone data collected from the Fresno First Street monitoring station. The table includes the maximum one-hour and eight-hour ozone levels and the number of days above the state or national standards. Ozone formation is higher in spring and summer and lower in the winter. The SJVAB was classified as an extreme nonattainment area for the previous federal 1-hour ozone standard (no longer applicable) and is classified as a serious nonattainment area for the federal 8-hour ozone standard. The SJVAB is also classified as a severe nonattainment area for the state 1-hour ozone standard.

AIR QUALITY Table 4
Ozone Air Quality Summary, 1996-2006 (ppm)

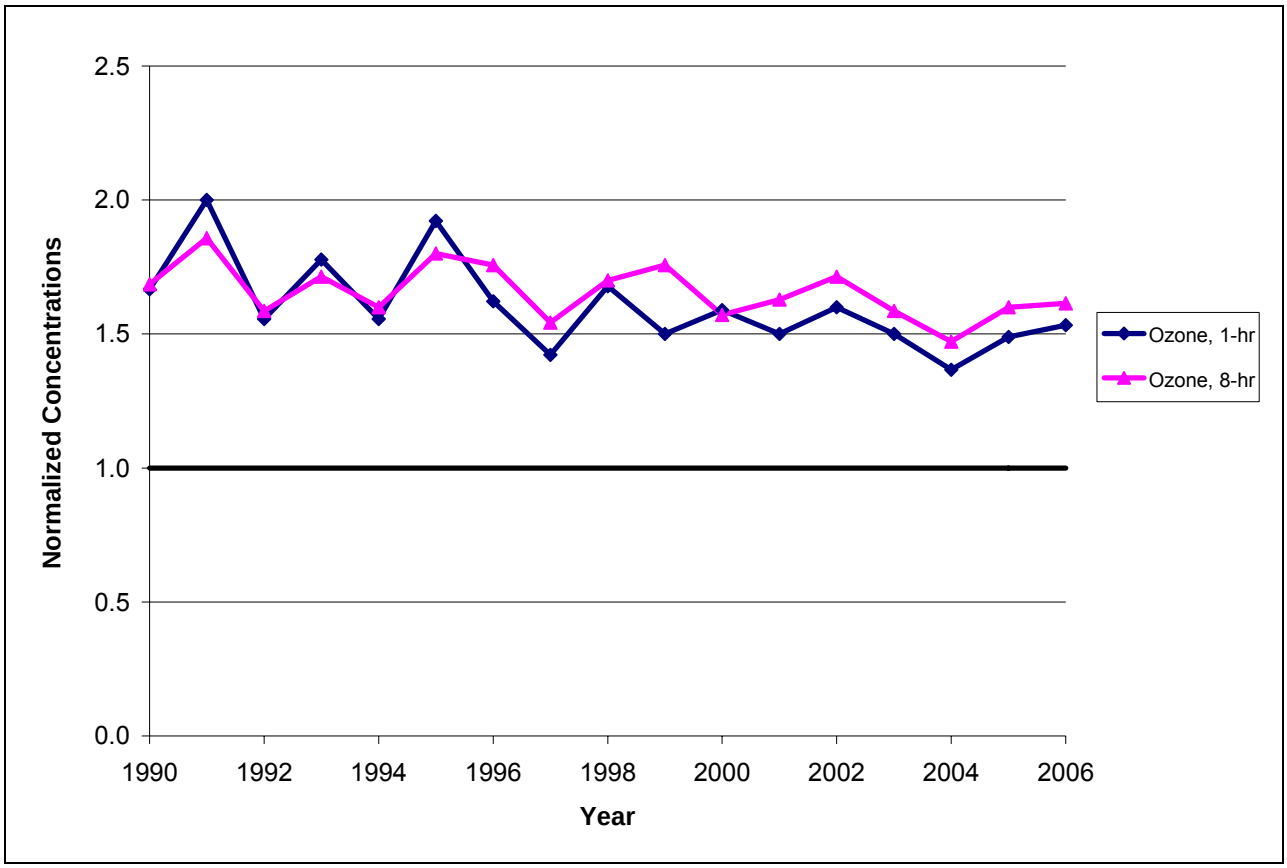
Year	Days Above CAAQS 1-Hr	Month of Max. 1-Hr Avg.	Max. 1-Hr Avg.	Days Above NAAQS 8-Hr	Month of Max. 8-Hr Avg.	Max. 8-Hr Avg.
	Fresno First Street					
1996	59	AUG	0.146	49	AUG	0.123
1997	30	AUG	0.128	23	AUG	0.107
1998	46	AUG	0.151	44	JUL	0.118
1999	53	JUL	0.135	45	JUL	0.123
2000	48	SEP	0.143	41	SEP	0.109
2001	51	AUG	0.135	40	AUG	0.113
2002	45	JUL	0.144	41	JUL	0.119
2003	56	SEP	0.135	47	SEP	0.111
2004	23	SEP	0.123	18	AUG	0.103
2005	31	JUL	0.134	27	JUL	0.111
2006	45	JUN	0.138	38	JUN	0.113
California Ambient Air Quality Standard (CAAQS): 1-Hr, 0.09 ppm, 8-Hr, 0.070 ppm National Ambient Air Quality Standard (NAAQS): 8-Hr, 0.08 ppm						

Source: ARB 2006a, ARB 2007c.

The yearly trends from 1986 to 2006 for the maximum one-hour and eight-hour ozone concentrations, referenced to the most stringent standard, and the number of days exceeding the California one-hour standard and the federal eight-hour standard for the Fresno Olive Street (1986-1989) and Fresno First Street (1990-2006) monitoring stations are shown in **Air Quality Figure 2** and **Figure 3**, respectively.

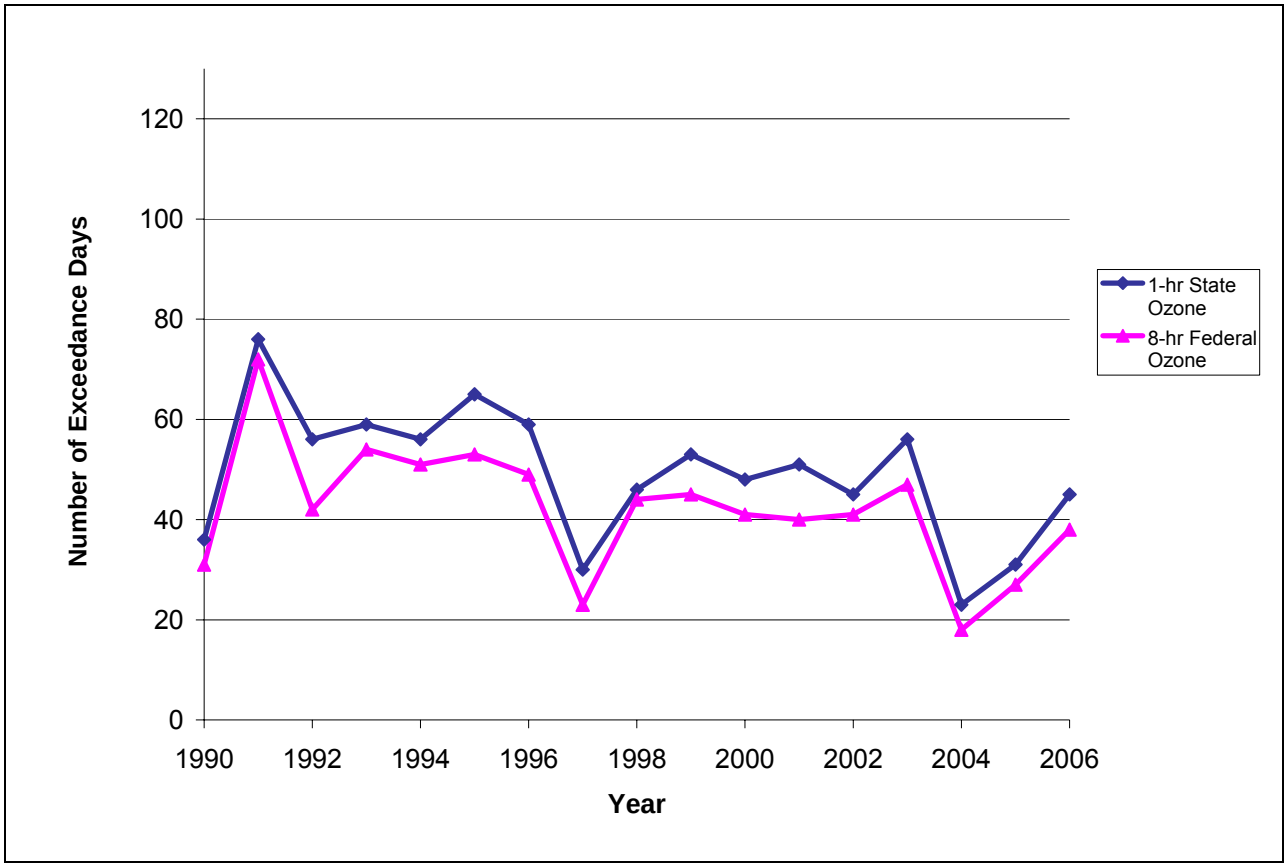
As these two figures show, the one-hour ozone concentration peaked in 1991 and the eight-hour ozone concentration peaked in 1989, and the number of days exceeding the air quality standards peaked in 1991. However, there has been little or no improvement in the peak concentrations and number of exceedances since 1995.

AIR QUALITY Figure 2
Normalized Ozone Air Quality Maximum Concentrations
Fresno First Street (1990-2006)



Source: ARB 2006a, ARB 2007c.
A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. The standard used for one-hour ozone is the state standard of 0.09 ppm, and for eight-hour ozone is the state standard of 0.070 ppm.

AIR QUALITY Figure 3
Ozone – Number of Days Exceeding the Air Quality Standards
Fresno First Street (1990-2006)



Source: ARB 2006a, ARB 2007c.

Respirable Particulate Matter (PM10)

As **Air Quality Table 5** indicates, the project area annually experiences a number of violations of the state and federal 24-hour PM10 standards. The SJVAB is classified as a serious nonattainment area for the federal PM10 standard and as a nonattainment area for the state PM10 standards.

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, SOx and VOC from turbines, and ammonia from NOx control equipment, given the right meteorological conditions, can form particulate matter in the form of nitrates (NO_3), sulfates (SO_4), and organic particles. These pollutants are known as secondary particulates, because they are not directly emitted, but are formed through complex chemical reactions in the atmosphere.

AIR QUALITY Table 5
PM10 Air Quality Summary, 1996-2006 ($\mu g/m^3$)

Year	Days * Above Daily CAAQS	Month of Max. Daily Avg.	Max. Daily Avg.	Annual Arithmetic Mean
	Fresno First Street			
1996	64	NOV	144	37.1
1997	71	DEC	124	42.6
1998	77	DEC	149	33.7
1999	110	DEC	162	44.6
2000	72	JAN	139	40.3
2001	98	JAN	204	42.6
2002	90	NOV	100	39.7
2003	80	OCT	74	**35.0**
2004	30	JAN	58	31.3
2005	58	NOV	**109**	32.9

California Ambient Air Quality Standard: 24-Hr, 50 $\mu g/m^3$; Annual Arithmetic, 20 $\mu g/m^3$
National Ambient Air Quality Standard: 24-Hr, 150 $\mu g/m^3$

* Days above the state standard (calculated): PM10 is monitored approximately once every six days. Estimated days mathematically estimates how many days concentrations would have been greater than the level of the standard had each day been monitored.

Maximum average values corresponding to the most restrictive standard occurring during the most recent three years of available data are indicated in bold.

Source: ARB 2006a, ARB 2007c.

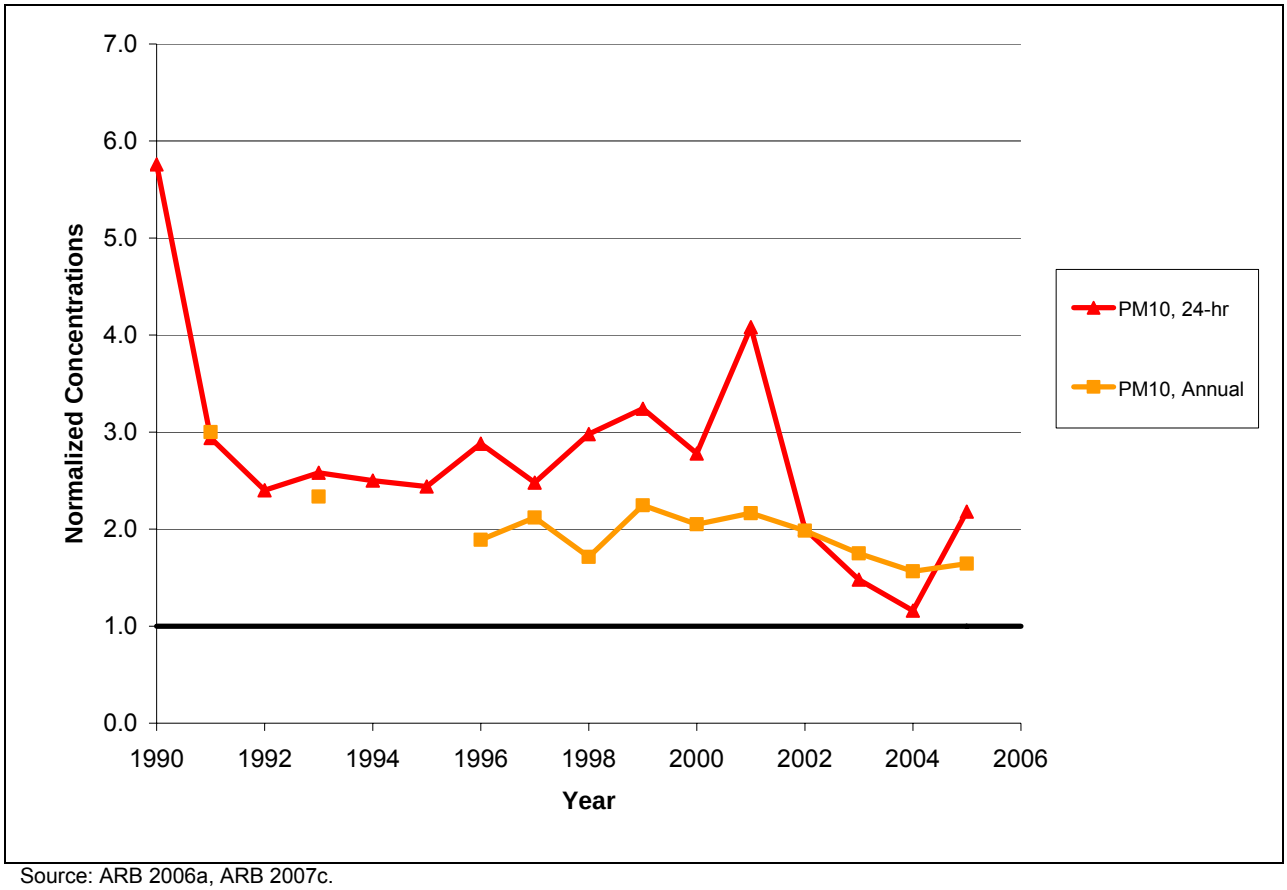
PM nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NOx emissions from combustion sources. The nitrate ion concentrations during the wintertime are a significant portion of the total PM10, and are likely even a higher contributor to particulate matter of less than 2.5 microns (PM2.5). The nitrate ion is only a portion of the PM nitrate, which can be in the form of ammonium nitrate (ammonium plus nitrate ions) and some as sodium nitrate. If the ammonium and the sodium ions associated with the nitrate ion are taken into consideration, PM nitrate contributions to the total PM are even more significant.

As shown in **Air Quality Table 5**, the highest PM10 concentrations are generally measured in the fall and winter when there are frequent low-level inversions. During the wintertime high PM10 episodes, the contribution of ground level releases to ambient PM10 concentrations is disproportionately high.

The 1986 to 2006 yearly trends for the maximum 24-hour PM10 and Annual Arithmetic Mean PM10, referenced to the most stringent standard, and the number of days exceeding the California 24-hour PM10 standard for the Fresno Olive Street (1986-1989) and Fresno First Street (1990-2006) monitoring stations are shown in **Air Quality Figure 4** and **Figure 5**, respectively.

As the two figures show, there is an overall gradual downward trend for PM10 concentrations and number of violations of the California 24-hour standard since 1987; however, there has been little or no progress since 1995.

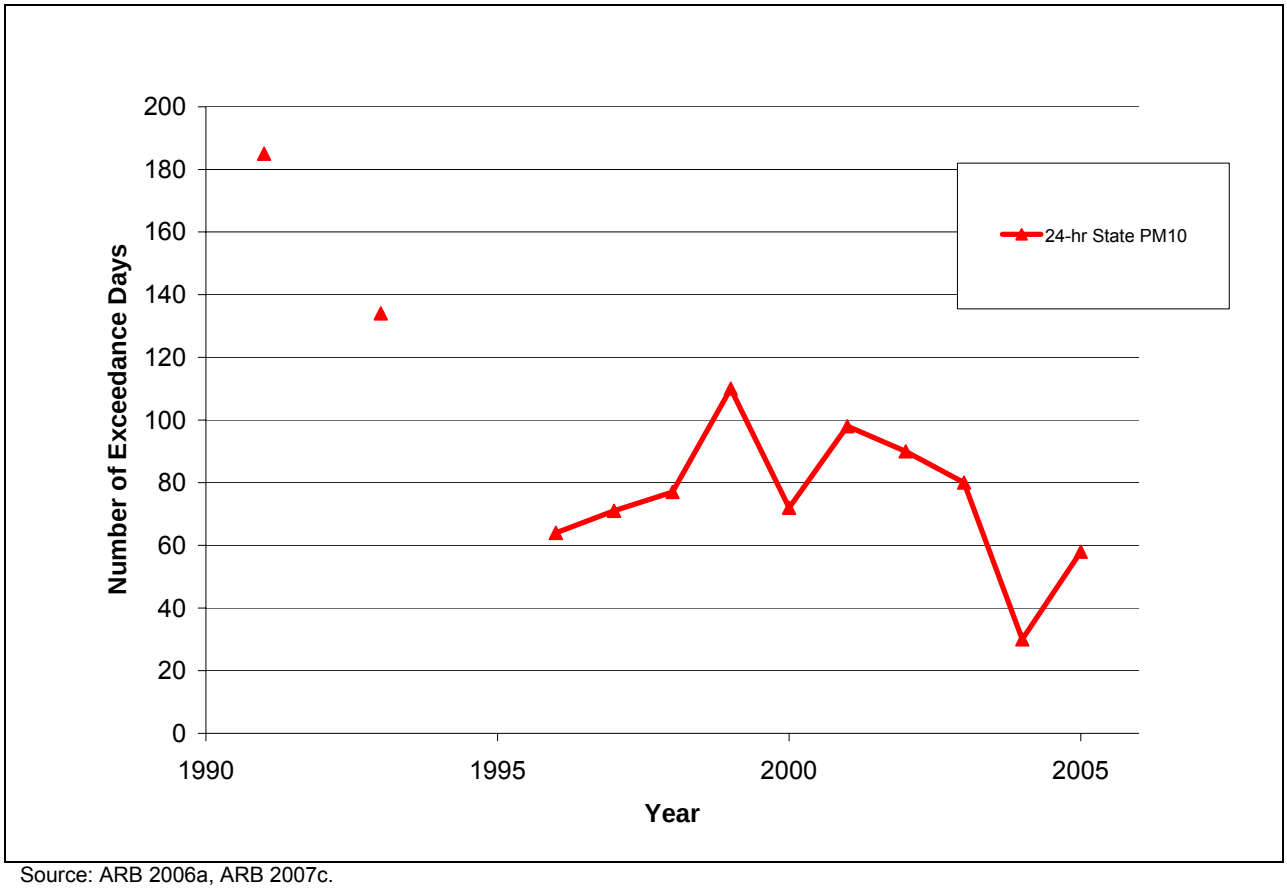
AIR QUALITY Figure 4
Normalized PM10 Air Quality Maximum Concentrations
Fresno First Street (1990-2005)



Source: ARB 2006a, ARB 2007c.

A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. The standard used for 24-hour PM10 is the state standard of 50 □g/m^3, for the Annual Arithmetic Mean is the state standard of 20 □g/m^3, for 24-hour PM2.5 is the federal standard of 35 □g/m^3, and for the National Annual Arithmetic Mean PM2.5 is the is the federal standard of 15 □g/m^3.

AIR QUALITY Figure 5
PM10 24-Hour – Number of Days Exceeding the Air Quality Standard
Fresno Olive Street (1986-1989) and Fresno First Street (1990-2006)



Source: ARB 2006a, ARB 2007c.

Respirable Particulate Matter (PM 2.5)

The SJVAB is classified as nonattainment for the state respirable particulate matter (PM2.5) standard. As shown in **Air Quality Table 6**, the highest PM2.5 concentrations are generally measured in the winter. The relative contribution of wood-smoke particles to the PM2.5 concentrations may be even higher than its relative contribution to PM10 concentrations, considering that most of the wood-smoke particles are smaller than 2.5 microns.

The 1999 to 2006 yearly trends for the 24-hour 98th percentile PM2.5 and National Annual Arithmetic Mean PM2.5, referenced to the most stringent standard, and the number of days exceeding the federal 24-hour PM2.5 standard for the Fresno First Street monitoring station are shown above in **Air Quality Figure 4** and **Figure 5**, respectively. As the two figures show, there is an overall gradual downward trend for PM2.5 concentrations and number of violations of the federal 24-hour standard since 1999.

As **Air Quality Table 6** indicates, the 24-hour (3-year average 98th percentile) PM2.5 concentration levels have been declining from 1999-2005, but were still above the NAAQS of 35 $\mu g/m^3$ in 2003 at the Fresno First Street monitoring station. The annual

arithmetic means also appear to have been declining from 1999-2005, but continue to be above the NAAQS of 15 $\mu g/m^3$ and the CAAQS of 12 $\mu g/m^3$.

AIR QUALITY Table 6
PM2.5 Air Quality Summary, 1999-2005 ($\mu g/m^3$)

Year	National Maximum Daily	98th Percentile Maximum Daily	3-Yr National 98th Percentile Maximum Average	State Annual Average	National Annual Average
	Fresno First Street				
1999	136	120	---	23.4	27.7
2000	160	108	---	---	---
2001	110	76	101	---	19.8
2002	99.7	77	86	---	21.6
2003	56	56	**69**	17.7	17.7
2004	52	52	61	16.8	16.4
2005	74	74	60	**19.7**	16.9

California Ambient Air Quality Standard: Annual Arithmetic Mean, 12 $\mu g/m^3$
National Ambient Air Quality Standard: 24-Hr Avg. Conc., 35 $\mu g/m^3$ (based on 98% of the daily concentrations, average over three years); Annual Arithmetic Mean, 15 $\mu g/m^3$

Maximum average values corresponding to the most restrictive standard occurring during the most recent three years of available data are indicated in bold.

Source: ARB 2006a, ARB 2007c.

The maximum daily PM2.5 concentrations shown in **Air Quality Table 6** all occurred in the late fall or winter (fourth and first quarters).

Carbon Monoxide (CO)

The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime, late in the afternoon, persist during the night and may extend one or two hours after sunrise. Since mobile sources (motor vehicles) are the main cause of CO, ambient concentrations of CO are highly dependent on motor vehicle activity. In fact, the peak CO concentrations occur during the rush hour traffic in the mornings and afternoons. CO concentrations in Fresno County and the rest of the state have declined significantly due to two state-wide programs: 1) the 1992 wintertime oxygenated gasoline program, and 2) Phases I and II of the reformulated gasoline program. New vehicles with oxygen sensors and fuel injection systems have also contributed to the decline in CO levels in the state. Today, all the areas of California, with the sole exception of certain locations within Los Angeles County, are in attainment with the CO ambient air quality standards.

As **Air Quality Table 7** shows, the maximum one-hour and eight-hour CO concentrations in the project area are less than the California Ambient Air Quality Standards. CO is considered a local pollutant, as it is found in high concentrations only near the source of emission. Automobiles and other mobile sources are the principal sources of the CO emissions. High levels of CO emissions can also be generated from fireplaces and wood-burning stoves. According to the data recorded at the Fresno First

Street air monitoring station, there have been no violations of the California Ambient Air Quality Standards since 1990 for the one-hour CO standard and since 1992 for the eight-hour CO standard (see **Air Quality Figure 1 and Table 7**).

AIR QUALITY Table 7
CO Air Quality Summary, 1996-2006 (ppm)

Year	Month of Max. 8-Hr Average	Maximum 1-Hr Average	Maximum 8-Hr Average
	Fresno First Street		
1996	NOV	10.0	6.82
1997	OCT	8.7	5.69
1998	DEC	9.0	5.88
1999	DEC	8.7	5.53
2000	JAN	7.9	5.24
2001	JAN	6.7	4.64
2002	NOV	6.1	4.51
2003	NOV	4.9	3.56
2004	NOV	3.9	2.84
2005	NOV	**4.1**	**2.95**
2006	NOV	---	2.19

California Ambient Air Quality Standard: 1-Hr, 20 ppm; 8-Hr, 9.0 ppm
National Ambient Air Quality Standard: 1-Hr, 35 ppm; 8-Hr, 9 ppm

Maximum average values corresponding to the most restrictive standard occurring during the most recent three years of available data are indicated in bold.

Source: ARB 2006a, ARB 2007c.

Nitrogen Dioxide (NO_2)

As shown in **Air Quality Table 8,** the maximum one-hour and annual concentrations of NO_2 at the Fresno First Street monitoring station are lower than the California and National Ambient Air Quality Standards. Approximately 75 to 90% of the NOx emitted from combustion sources is NO, while the balance is NO_2. NO is oxidized in the atmosphere to NO_2, but some level of photochemical activity is needed for this conversion. This is why the highest concentrations of NO_2 generally occur during the fall and not in the winter, when atmospheric conditions favor the trapping of ground level releases, but lack significant photochemical activity (less sunlight). In the summer, the conversion rates of NO to NO_2 are high, but the relatively high temperatures and windy conditions (atmospheric unstable conditions) generally disperse pollutants, preventing the accumulation of NO_2 to levels approaching the California one-hour ambient air quality standard. The formation of NO_2 in the summer, in the presence of ozone, is according to the following reaction:

$$NO + O_3 \rightarrow NO_2 + O_2$$

In urban areas, ozone concentration levels are typically high. These levels drop substantially at night as the above reaction takes place between ozone and NO. This reaction explains why, in urban areas, ozone concentrations at ground level drop, while aloft and in downwind rural areas (without sources of fresh NOx emissions) ozone concentrations can remain relatively high.

AIR QUALITY Table 8
NO_2 Air Quality Summary, 1996-2006 (ppm)

Year	Month of Max. 1-Hr Average	Maximum 1-Hr Average	Maximum Annual Average
	Fresno First Street		
1996	AUG	0.093	0.021
1997	NOV	0.092	0.021
1998	SEP	0.112	0.020
1999	OCT	0.103	0.023
2000	SEP	0.094	0.021
2001	OCT	0.090	0.021
2002	OCT	0.088	0.020
2003	OCT	0.090	0.019
2004	OCT	0.077	0.017
2005	OCT	**0.084**	**0.017**
2006	OCT	0.067	0.016

California 1-Hr Ambient Air Quality Standard: 0.25 ppm
National Annual Arithmetic Mean Ambient Air Quality Standard: 0.053 ppm

Maximum average values corresponding to the most restrictive standard occurring during the most recent three years of available data are indicated in bold.

Source: ARB 2006a, ARB 2007c.

Sulfur Dioxide (SO_2)

Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. Fuels, such as natural gas, contain very little sulfur and consequently have very low SO_2 emissions when combusted. By contrast, fuels high in sulfur content, such as coal, emit very large amounts of SO_2 when combusted.

Sources of SO_2 emissions within the SJVAB come from every economic sector and include a wide variety of fuels: gaseous, liquid and solid. The SJVAB is designated attainment for all the SO_2 state and federal ambient air quality standards. **Air Quality Table 9** shows the historic one-hour, 24-hour and annual average SO_2 concentrations collected from the Fresno First Street monitoring station. No monitoring of SO_2 has occurred at this station since 1997 (data for 1997 was incomplete and therefore was not included). As **Air Quality Table 9** shows, concentrations of SO_2 are far below the state and federal SO_2 ambient air quality standards.

Visibility

Visibility in the region of the project site depends upon the area's natural relative humidity and the intensity of both particulate and gaseous pollution in the atmosphere. The most straightforward characterization of visibility is probably the visual range (the greatest distance that a large dark object can be seen). However, in order to characterize visibility over a range of distances, it is more common to analyze the changes in visibility in terms of the change in light-extinction that occurs over each additional kilometer of distance (1/km). In the case of a greater light-extinction, the visual range will decrease.

The SJVAB is currently designated as unclassified for visibility reducing particles.

AIR QUALITY Table 9
SO_2 Air Quality Summary, 1990-1996 (ppm)

Year	Maximum 1-Hr Avg.	Month of Max. 24-Hr Avg.	Maximum 24-Hr Avg.	Annual Average
	Fresno First Street			
1990	0.030	NOV	0.016	0.003
1991	0.030	FEB	0.013	0.004
1992	0.030	MAY	0.010	0.002
1993	0.010	JUN	0.010	0.002
1994	0.017	DEC	0.011	0.004
1995	0.014	JUL	0.010	0.004
1996	0.015	MAR	0.009	0.002
	Fresno Fremont School Station			
2003	**0.009**	JUL	**0.004**	**0.002**

California Ambient Air Quality Standard: 1-Hr, 0.25 ppm; 24-Hr, 0.04 ppm
National Ambient Air Quality Standard: 3-Hr, 0.5 ppm; 24-Hr, 0.14 ppm; Annual, 0.030 ppm

Maximum average values corresponding to the most restrictive standard occurring during the most recent available data are indicated in bold.

Source: ARB 2006a, ARB 2007c.

Summary

Staff used the background ambient air concentrations in **Air Quality Table 10** in the modeling and impacts analysis. The maximum criteria pollutant concentrations from the past three years of available data collected at the monitoring stations within Fresno County are used to determine the recommended background values.

AIR QUALITY Table 10
Staff Recommended Background Concentrations ($\mu g/m^3$)

Pollutant	Averaging Time	Recommended Background	Limiting Standard	Percent of Standard
NO_2	1 hour	157.9	470	34%
	Annual	32.1	100	32%
PM10	24 hour	109	50	218%
	Annual	35	20	175%
PM2.5	24 hour	69	35	197%
	Annual	19.7	12	164%
CO	1 hour	4,715	23,000	21%
	8 hour	3,278	10,000	33%
SO_2	1 hour	23.6	655	4%
	3 hour [a]	21.2	1,300	2%
	24 hour	10.5	105	10%
	Annual	5.3	80	7%

Source: ARB 2006a, ARB 2007c & Energy Commission Staff Analysis
[a] The 3-hour background SO_2 concentration is assumed to be 90% of the 1-hour background.

Where possible, staff prefers that the recommended background concentrations come from nearby monitoring stations with similar characteristics; however no monitoring stations are located near the project site. Monitoring stations located within larger urban

areas (Fresno) provide conservative estimates for background concentrations. For all pollutants, except for SO_2, the highest monitored values from the Fresno First Street monitoring station was used to determine the background concentrations. For SO_2, the 2003 monitored concentrations from the Fresno Fremont School monitoring station were used to determine the background concentrations.

The background concentrations for PM10 and PM2.5 are well above the most restrictive existing ambient air quality standards, while the background concentrations for the other pollutants are all well below the most restrictive existing ambient air quality standards.

PROJECT DESCRIPTION AND EMISSIONS

Panoche Energy Center, LLC has proposed to develop the PEC on a 12.8 acre site within a 128-acre parcel (PEC 2006a). The construction laydown area, including laydown and parking, consists of 8-acres within the 128-acre parcel. In addition, a 1.1-acre area is required for expansion of PG&E's adjacent existing substation. Access to the site will require upgrading and extending an existing access road to create a 400-foot long, 24-foot wide paved access road heading south from Davidson Avenue, approximately 400 feet south of the intersection with West Panoche Road, to the facility's main gate. Improvements will require a 50 foot access easement, widening the road surface, improving drainage, and laying gravel. The newly paved road will have two 12-foot-wide lanes with 5-foot-wide gravel shoulders and contoured drainage ditches.

A 16-inch natural gas pipeline approximately 2,400 feet in length will be built to connect the facility to an existing PG&E high-pressure gas trunk line located east of PG&E's electrical substation. A new gas metering and associated on-site piping will be located on the eastern side of the site. Power line easements are located along the western boundary of the site and adjacent to the northeast corner of the site. Process water and non-potable water uses will be supplied to the PEC from two new groundwater wells drilled onsite into the Westside Sub-basin of the San Joaquin Valley Groundwater Basin. Potable water will supplied to the PEC by a bottled water service. Process wastewater will be disposed of using a deep well injection system. Sanitary wastes will be directed to a septic system and leach field designed to treat the sanitary flow from the administration and control building and restrooms.

CONSTRUCTION

Construction of the PEC would consist of the following: 1) Injection and production well installation (three months total); 2) clearing and grubbing, removal of pomegranate trees (one month); 3) site grading (2 months); 4) building of facility structures (10 months); 5) gas pipeline construction (one month that overlaps with building of facility structures); and 6) substation improvement (5 months that overlaps for three months with building of facility structures). The construction is expected to take a total of 18 months, based on an 8-hour workday and a 5-day workweek.

Fugitive dust emissions during the construction of the project would result from dust entrained during site preparation and grading/excavation activities, on-site travel on paved and unpaved surfaces, and aggregate and soil loading and unloading operations,

as well as wind erosion of areas disturbed during construction activities. The largest fugitive dust emissions are generated during site preparation activities, where work such as clearing, grading, excavation of footings and foundations, and backfilling operations occur. These types of activities require the use of large earth moving equipment, which generate combustion emissions, along with creating fugitive dust emissions. The site has very fine soils (PEC 2006a, Appendix L) that will exacerbate fugitive dust formation potential during site grading activities.

Combustion emissions during the construction of the project result from exhaust sources, including diesel construction equipment used for site preparation, water trucks used to control dust emissions, diesel-powered welding machines, electric generators, air compressors, water pumps, diesel trucks used for deliveries, and automobiles and trucks used by workers to commute to and from the construction site.

The applicant estimates that the maximum short-term emissions for the injection well installation will occur in Month 1, and for the site preparation phase will occur in Months 5 and 6 of the project construction schedule. Maximum emissions from the building of the facility structures are expected to occur between Months 7 and 16. Fugitive dust emissions resulting from onsite soil disturbances, such as dozing and grading, and from onsite and offsite traffic were estimated. A dust control efficiency of 85% was assumed to be achieved for these activities based on frequent watering.

The applicant's emission estimates for the highest daily emissions during construction, based on Month 1 (Injection Well Installation) for NOx and SOx, and Months 5 and 6 (Site Preparation and Commuter Vehicles) for CO, VOC, PM10 and PM2.5, are shown in **Air Quality Table 11**. Total on-site construction heavy equipment exhaust and fugitive dust emissions during the 18-month construction period are summarized in **Air Quality Table 12**.

AIR QUALITY Table 11
Maximum Mitigated On-Site Construction Daily Emissions, lbs/day

Activity	NOx	CO	VOC	SOx	PM10	PM2.5
On-Site						
Injection Well Installation						
Combustion Exhaust	303.45	---	---	0.33	---	---
Site Grading						
Combustion Exhaust	---	53.98	14.37	---	5.62	5.17
Fugitive Dust	---	---	---	---	30.95	6.50
Off-site						
Commuter Vehicles						
Combustion Exhaust	---	138.46	14.94	---	0.86	0.15
Fugitive Dust	---	---	---	---	69.12	11.68
Total Max. Emissions	303.45	192.44	29.31	0.33	106.55	23.50

Source: Data Responses (PEC 2007a, DR12), Appendix 1, Attachment B (Revised), Excel table of "Construction Emissions".

AIR QUALITY Table 12
Total Mitigated Construction Emissions, tons/year

Activity	NOx	CO	VOC	SOx	PM10	PM2.5
Injection Well Installation	2.6	0.8	0.2	0.00	0.1	0.1
Production Well Installation	5.3	1.7	0.5	0.01	0.2	0.2
Clearing and Grubbing	0.5	0.2	0.1	0.01	0.1	0.2
Site Preparation	3.0	1.2	0.3	0.00	1.7	0.3
Facilities Building	14.1	5.4	1.7	0.00	1.2	0.8
Pipeline Construction	0.6	0.2	0.1	0.01	0.1	0.0
Substation Expansion	0.9	0.5	0.2	0.00	0.5	0.2
Commuter Vehicles	1.9	18.3	2.0	0.00	9.2	1.6
Total Yearly Emissions	28.9	28.3	5.0	0.03	13.1	3.3

Source: Data Responses (PEC 2007a, DR12), Appendix 1, Attachment B (Revised), Excel table of "Construction Emissions".

INITIAL COMMISSIONING

The initial commissioning of a power plant refers to the time between the completion of construction and the reliable production of electricity for sale on the market. For most power plants, normal operating emission limits usually do not apply during the initial commissioning activities.

Commissioning activities for the PEC combustion turbine generators (CTGs) are expected to last approximately 136 hours for each turbine (PEC 2006a, p. 5.2-19). The range of commissioning tests for each CTG at the PEC includes the following: 1) first fire (unit operates at synchronous idle and a system check is performed including checking the emergency stop (E-stop)); 2) controlled break-in (unit is synchronized to the electrical grid and then operated at five percent load to test the voltage regulator); 3) dynamic Automatic Voltage Regulator (AVR) and water injection (unit is operates as several points over entire load range for dynamic commissioning of the voltage regulator and commissioning of the NOx water injection system); 4) base load AVR; 5) SCR commissioning (unit operates to adjust SCR control; and 6) full load testing (unit operates at full load for performance and emission tests)(PEC 2006a, p. 5.2-19). **Air Quality Table 13** presents the applicant's estimated typical initial commissioning activity emissions for each of the PEC CTGs. The applicant has indicated that to ensure the facility does not exceed the California AAQS for NOx, commissioning tests would not be conducted on more than two turbines in the same hour (PEC 2007a, DR4).

The SO_2 emissions during initial commissioning are not estimated to be higher than normal full load operations.

AIR QUALITY Table 13
PEC Typical Commissioning Emissions

Commissioning Activities	Operation Duration	Fuel Use	NOx	CO	VOC	PM10
Each CTG	**(Hours)**	**(MMBtu/hr)**	**Emissions, lb/event**			
First Fire (Core/Sync Idle)	16	73.5	178	727	18.5	96
Synch and Check E-stop (Idle)	12	73.5	133.5	545.2	13.9	72
Additional AVR Commissioning (5% power)	12	92.8	251	363.2	8.7	72
Break-in Run (5% power)	8		167.3	242.1	5.8	48
Dynamic Commissioning of AVR and Commission Water Injection						
Load Step 1 (10% power)	4	166.1	66.8	277	21.0	24
Load Step 2 (20% power)	4	245.5	98.6	181	10.4	24
Load Step 3 (30% power)	4	319.3	128	181	10.6	24
Load Step 4 (40% power)	4	389.1	156	160	10.7	24
Load Step 5 (50% power)	4	457.4	184	132	11.3	24
Load Step 6 (60% power)	4	524.6	211	180	13.5	24
Load Step 7 (70% power)	4	590.8	237	247	16.3	24
Load Step 8 (80% power)	4	658.5	265	349	20.7	24
Load Step 9 (90% power)	4	727.9	292	516	29.5	24
Load Step 10 (100% power)	4	798.1	321	789	47.9	24
Base load AVR Commissioning (100% power)	16	798.1	2,689	4,890	239.0	96
Total (1 CTG)	104	5,915.2	5,378.2	9,779.5	477.8	624

Source: Data Response (PEC 2007a, DR 8), "Operating and stack parameters for LM2100 Commissioning".

Air Quality Table 14 presents the applicant's worst-case short-term initial commissioning emissions which represent the emissions during the base load AVR commissioning test.

AIR QUALITY Table 14
PEC Worst-Case NOx and CO Short-Term Commissioning Emissions

Pollutant	Lbs/hr
NOx	168
CO	305.6

Source: Data Response (PEC 2007a, DR 2 and 8).

The initial commissioning modeling analysis presented in the impacts section uses these worst-case emission values.

OPERATIONAL PHASE

Equipment Description

The equipment for the proposed PEC would include the following major components (PEC 2006a):

- Four General Electric LMS100 natural gas-fired combustion turbine generators (CTGs) operating in simple cycle mode, producing approximately 100 MW of electricity each;
- The CTGs would each be equipped with water injection to the combustors for reducing production of NOx, a selective catalytic reduction (SCR) system with 19% aqueous ammonia injection to further reduce NOx emissions, and an oxidation catalyst to reduce CO emissions;
- Four compressor intercooler heat exchangers (105 MMBtu/hour);
- Combustion turbine inlet air filters;
- Four exhaust stacks (diameter of 14.5-feet and height of 90-feet);
- A continuous emission monitoring (CEM) system installed on each stack of the CTG would record concentrations of NOx, CO, CO_2, and oxygen in the flue gas;
- Mechanical draft 5-cell cooling tower (27,600 gallons/minute, 3 cycles of concentration) with chemical feed system consisting of a bulk sulfuric acid storage tank and two full-capacity sulfuric acid metering pumps. The cooling tower is sized so that only 4 of the 5 cells will ever need to operate at any given time;
- 160-horsepower (hp) emergency diesel firewater pump;
- Raw water storage tank (500,000 gallons);
- Demineralized water storage tank (240,000 gallons);
- Wastewater collection tank (20,000 gallons); and
- On-site underground injection well(s) for wastewater disposal (average rate of 540,000 gallons/day or approximately 388 gallons/minute).

Facility Operation

The PEC would include four stationary, natural gas-fired combustion turbines for power production. The CTGs would generate an average of 400 MW (100 MW each) at summer design ambient conditions. Each CTG would be equipped with water injection to the combustors for reducing production of oxides of nitrogen (NOx), and a selective catalytic reduction (SCR) system that uses ammonia vapor in the presence of a catalyst to reduce the NOx concentration in the exhaust gases.

Each turbine of the PEC would operate up to 5,000 hours per year, as required by PG&E, which equates to an annual capacity factor of 57% (PEC 2006a, p. 3-54). This differs from the equivalent availability factor (EAF), which considers the projected percent of energy production capacity achievable. The EAF may be defined as a weighted average of the percent of full energy production capacity achievable. The

projected EAF for the PEC is estimated to be approximately 95 to 99%. The PEC will generally be operated to provide maximum electrical output during summer periods when demand for electricity is highest (PEC 2006a, p. 3-4). The unit may be shut down or operated at partial load when reduced market demand makes full load operation uneconomical.

Operation Emission Controls

The exclusive use of pipeline-quality natural gas, a relatively clean-burning fuel, would limit the formation of VOC, PM10, and SO_2 emissions. Natural gas contains very little noncombustible gas or solid residues and a small amount of reduced sulfur compounds, including mercaptan. Water injection to the CTG combustors in conjunction with selective catalytic reduction (SCR) would be used to control NOx concentrations in the exhaust gas. Post-combustion NOx control would be provided using a selective catalytic reduction (SCR) system. The SCR system would use aqueous ammonia to further reduce NOx emissions to 2.5 parts per million by volume, dry (ppmvd) adjusted to 15% oxygen from the gas turbines/SCR systems (PEC 2006a, p. 3-24). Ammonia slip would be limited to 10 ppmvd at 15% oxygen on a dry basis (PEC 2006a, p. 3-24). An oxidizing catalytic converter would be used to reduce the CO concentration in the exhaust gas emitted to the atmosphere to 6 ppmvd adjusted to 15% oxygen from the CTGs. Particulate emissions would be controlled using natural gas as the sole fuel for the CTG and inlet air filtration (PEC 2006a, p. 3-24).

Four 90-foot-tall, 14.5-foot diameter stacks would release the CTG exhaust gas into the atmosphere. A continuous emission monitoring (CEM) system would be installed on the CTG stack to monitor fuel gas flow rate, NOx and CO concentration levels, and percentage of oxygen in the flue gas to assure adherence with the proposed emission limits. The CEM system would generate reports of emissions data in accordance with permit requirements and send alarm signals to the plant's control room when the level of emissions approaches or exceeds pre-selected limits.

Air emissions from the diesel-driven firewater pump would be minimized by the use of a California Air Resources Board (ARB) compliant low emission diesel engine fueled with ARB compliant diesel fuel.

Project Operating Emissions

Air emissions would be generated from operating the four CTGs, 5-cell cooling tower, and a diesel firewater pump, which would be tested one hour per week (52 hours per year) to ensure operability in the event of an emergency. The normal operating emission rates (100% load) for the CTGs, cooling tower, and firewater pump are provided in **Air Quality Table 15.**

AIR QUALITY Table 15
Maximum Normal Pollutant Emission Rates, lb/hr [a]

Pollutant	ppmvd @ 15% O_2	Each CTG	4 CTGs	Cooling Tower	Firewater Pump
NOx	2.5	8.03	32.12	---	1.38
CO	6.0	11.81	47.24	---	0.23
VOC	2.0	2.67	10.68	---	0.35
PM10/PM2.5	---	6.0	24.0	0.35	0.05
SO_2 [b]	---	2.51	10.04	---	0.0023
NH_3	10.0	11.90	47.6	---	---

Source: Data Response (PEC 2007a, DR2) Table 5.2-12 (Revised), Appendix I, Attachment C (Revised).
[a] Maximum pollutant emissions estimated at 63°F and 100% load, except for VOC which occurs at 114°F with the cooler on and 100% load.
[b] SO_2 emissions are based on annual average natural gas sulfur content of 1.0 grains/100 dry standard cubic feet, as required per the policy of the SJVAPCD.

Expected event emission rates during startup and shutdown events are summarized in **Air Quality Table 16**.

Air Quality Table 16
PEC Criteria Pollutant Emission Rates
Maximum Short-Term Event Emissions, lbs/event

Startup Sequence	NOx	CO	VOC	SO_2 [a]	PM10
Startup – 10 min	5.0	14.0	3.0	0.42	1.0
Warmup – 20 min	17.3	39.3	0.8	0.84	2.0
Normal Operations – 30 min	4.01	5.90	1.33	1.25	3.0
Hourly Emissions	26.31	59.20	5.13	2.51	6.0
Worst-Case Startup	44.40	106.6	7.60	2.51	6.0
Shutdown Sequence					
Normal Operations – 49.5 min	6.62	9.74	2.20	1.57	4.95
Shutdown – 10.5 min	6.0	47.0	3.0	0.33	1.05
Hourly Emissions	12.62	56.74	5.20	1.90	6.00
Worst-Case Shutdown b	34.29	268.57	17.14	2.51	6.00

Source: Data Response (PEC 2007a, DR2), Table 5.2-13 (Revised).
[a] SO_2 emission rates assume a fuel sulfur concentration of 1.0 grains per 100 dry standard cubic feet, as required per the policy of the SJVAPCD.
[b] Worst-case startup and shutdown is based on entire hour in startup or shutdown. This is the emission rate permitted for startup and shutdown in by the District (SJVAPCD 2007).

Startups are expected to last 10 minutes, followed by a 20-minute SCR warm-up period; and shutdowns are expected to be completed within 10.5 minutes.

Air Quality Table 17 summarizes the maximum (worst-case) estimated levels of the different criteria pollutants for each averaging time from the CTGs, cooling tower, and firewater pump for the PEC. Maximum hourly operations are based on four turbines operating at the highest hourly emission rate, startup for NOx, shutdown for CO and VOC, and normal operating maximums for PM10, SO_2 and NH_3. Maximum daily operations are based on 3 startups and 3 shutdowns for all four CTGs, with the remainder of the day in normal full-load operations with the cooling tower, plus 1 hour of firewater pump operation. For SO_2 and NH_3, turbines operate at normal operating load for 24-hours. Maximum annual emissions are based on full-time, full-load operation for 5,000 hours, which includes 365 startups, 365 shutdowns, 20 maintenance hours, and 4,754 hours at normal operating loads. The cooling tower is proposed to operate for

5,000 hours annually and the firewater pump operates for 52 hours annually (1 hour per week) (PEC 2007a, DR2, Table 5.2-14 Revised).

Air Quality Table 17
PEC Worst-Case Hourly, Daily and Annual Emissions

	Pollutant					
Emissions/Equipment	**NOx**	**SO_2 [a]**	**CO**	**VOC**	**PM10/2.5**	**NH_3 [b]**
Maximum Hourly Emissions, lb/hr						
Four CTGs	105.24	10.03	426.4	68.68	24.0	47.6
Firewater Pump	1.38	0.002	0.23	0.35	0.05	---
Cooling Tower	---	---	---	---	0.35	---
Maximum Daily Emissions, lb/day						
Four CTGs	1,044.4	240.8	2,241.6	316.4	576.0	1,142.4
Firewater Pump	1.38	0.002	0.23	0.35	0.05	---
Cooling Tower	---	---	---	---	8.4	---
Maximum Annual Emissions, lb/year						
Four CTGs	193,860	50,200	371,000	60,696	120,000	226,290
Firewater Pump	83	0.1	11	7	3	---
Cooling Tower	---	---	---	---	1762	---
Total Annual Emissions, tons/year	96.97	25.10	185.51	30.35	60.88	113.15

Source: Data Responses (PEC 2007a, DR2) Table 5.2-14 (Revised), Table 5.2-15 (Revised), Appendix I, Attachment C (Revised); and from the PDOC (SJVAPCD 2007).
[a] SO_2 emission rates assume a fuel sulfur concentration of 1.0 grains per 100 dry standard cubic feet, as required per the policy of the SJVAPCD. For CEQA offsetting purposes staff will use an average natural gas sulfur content of 0.32 grains per 100 dry standard cubic feet, which will result in an annual emission estimate of 8.1 tons/year.
[b] Maximum ammonia emissions base on 24 hours/day and 4,754 hours/year at base load conditions.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Staff assesses three kinds of impacts: construction, operation, and cumulative effects. As the name implies, construction impacts result from the emissions occurring during the construction of the project. The operation impacts result from the operating emissions of the proposed project over the proposed lifetime of the project. Cumulative impacts analysis assesses the impacts that result from the proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project. Additionally, cumulative impacts are assessed in terms of conformance with the District's attainment or maintenance plans.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff used two main significance criteria in evaluating this project. First, all project emissions of nonattainment criteria pollutants and their precursors (NOx, VOC, PM10 and SO_2) are considered significant and must be mitigated. Second, any AAQS violation or any contribution to any AAQS violation caused by any project emissions is considered to be significant and must be mitigated. For construction emissions, the mitigation that is considered is limited to controlling both construction equipment tailpipe emissions and fugitive dust emissions to the maximum extent feasible. For operating emissions, the mitigation includes both feasible emission controls (BACT) and the use of emission reduction credits to offset emissions of nonattainment criteria pollutants and their precursors.

The ambient air quality standards that staff uses as a basis for determining project significance are health-based standards established by the ARB and USEPA. They are

set at levels to adequately protect the health of all members of the public, including those most sensitive to adverse air quality impacts such as the aged, people with existing illnesses, children, and infants, including a margin of safety.

DIRECT/INDIRECT IMPACTS AND MITIGATION

While the emissions are the actual mass of pollutants emitted from the project, the impacts are the concentration of pollutants from the project that reach the ground level. When emissions are expelled at a high temperature and velocity through the relatively tall stack, the pollutants will be significantly diluted by the time they reach ground level. The emissions from the proposed project are analyzed through the use of air dispersion models to determine the probable impacts at ground level.

Air dispersion models provide a means of predicting the location and ground level magnitude of the impacts of a new emissions source. These models consist of several complex series of mathematical equations, which are repeatedly calculated by a computer for many ambient conditions to provide theoretical maximum offsite pollutant concentrations short-term (1-hour, 3-hour, 8-hour, and 24-hour) and annual periods. The model results are generally described as maximum concentrations often described as a unit of mass per volume of air, such as micrograms per cubic meter ($\mu g/m^3$).

The applicant has used EPA-approved screening (SCREEN3) and refined (ISC-PRIME versions 04269 and 04272) models to estimate the direct impacts of the project's NOx, PM10, CO, and SOx emissions resulting from project construction and operation. The applicant submitted the AFC and the District air quality permit application just before the District started requiring the use of AERMOD, EPA's currently preferred model, in place of ISCST3 or ISC-PRIME. In general, ISC-PRIME will provide more conservative results (i.e. predict higher impacts) than AERMOD in elevated terrain, while ISC-PRIME and AERMOD provide very similar results for near-field impacts in flat terrain. As such staff has determined that it is appropriate to use the ISC-PRIME model in this case.

Staff added the applicant's modeled impacts to the available highest ambient background concentrations as shown in **Air Quality Table 10**. Staff then compared the results with the ambient air quality standards for each respective air contaminant to determine whether the project's emission impacts would cause a new violation of the ambient air quality standards or would contribute to an existing violation.

In general, the inputs for the modeling include stack information (exhaust flow rate, temperature, and stack dimensions), specific turbine emission data and meteorological data, such as wind speed, atmospheric conditions, and site elevation. For this project, the meteorological data used as inputs to the model included hourly wind speeds and directions measured at Fresno, which is the closest complete meteorological data source to the project site, and is meteorological data approved for use by the SJVAPCD.

Construction Impacts and Mitigation

The following section discusses the project's short-term direct construction ambient air quality impacts, as estimated by the applicant, and provides a discussion of appropriate mitigation. Staff reviewed the construction emissions estimates and air dispersions

modeling procedures and considers them to be adequate and generally conservative for this siting case.

Construction Impact Analysis

The applicant modeled the emissions of the PEC on-site construction using the ISCST3 model. The fugitive dust emissions were modeled as a single area source that covered the total active area of the construction site. The exhaust emissions were modeled as volume sources, or in the case of the injection well installation as point sources. Overall, the methodology used by the applicant is overly simplified and does not take advantage of less conservative models or less conservative input methods. Therefore, the modeling method used by the applicant should overestimate impacts based on the construction emission quantities modeled.

For the determination of one-hour average construction NOx concentrations the applicant used an Ozone Limiting Method Calculation that multiplied the maximum modeled NOx value by the assumed initial NO_2/NOx ratio of 0.1 for diesel equipment and added the conversion of NO to NO_2 based on the background ozone concentration that corresponded to the maximum NOx impact hour.

To determine the construction impacts on short-term ambient standards (i.e. 1-hour through 24 hours), the worst-case daily on-site construction emission levels shown in **Air Quality Table 11** were used. For pollutants with annual average ambient standards, the annual on-site emissions levels shown in **Air Quality Table 12** were used. Modeling assumed that all of the equipment would operate from 7 am to 4 pm daily (PEC 2007a). **Air Quality Table 18** provides the results of this modeling analysis.

As can be seen from the modeling results provided in **Air Quality Table 18**, the construction impacts have the potential to worsen the existing violations of the PM10 and PM2.5 ambient air quality standards and are, therefore, potentially significant. The applicant's construction modeling analysis indicates that the maximum NOx, CO and SO_2 impacts will remain below the CAAQS and NAAQS.

AIR QUALITY Table 18
PEC Construction Impacts, (µg/m^3)

Pollutant	Averaging Period	Project Impact (µg/m^3)	Background (µg/m^3) [b]	Total Impact (µg/m^3)	Limiting Standard (µg/m^3)	Type of Standard	Percent of Standard
NO_2 [a]	one-hour	291.2	157.9	449.1	470	CAAQS	96
	annual	8.9	32.1	41	100	NAAQS	41
PM10	24-hour	46.3	109	155.3	50	CAAQS	311
	annual	1.3	35	36.3	20	CAAQS	182
PM2.5	24-hour	19.0	69	88	35	NAAQS	251
	annual	0.66	19.7	20.4	12	CAAQS	170
CO	one-hour	1,114.8	4,715	5,830	23,000	CAAQS	25
	eight-hour	870.2	3,278	4,148	10,000	CAAQS	41
SO_2	one-hour	4.7	23.6	28.3	655	CAAQS	4
	three-hour	2.4	21.2	23.6	1,300	NAAQS	2
	24-hour	0.7	10.5	11.2	105	CAAQS	11
	annual	0.01	5.3	5.3	80	NAAQS	7

Source (PEC 2007a and PEC 2007d, DR 4 and 22)
[a] One-hour NOx value was determined using Ozone Limiting Method (OLM) calculation. Staff adjusted the annual value provided by the applicant by multiplying by the Annual NOx Ratio Method (ARM) EPA default value of 0.75.
[b] Background values have been adjusted per staff recommended background concentrations shown in **AIR QUALITY Table 10**.

The maximum construction impacts generally occur at fence line. The maximum residential receptor[1] impacts, determined from the review of the applicants modeling files, are 6.83 µg/m^3 for 24-hour PM10 and 2.21 µg/m^3 for 24-hour PM2.5.

Construction Mitigation

As described in the "Laws, Ordinances, Regulations, and Standards" section, District Regulation VIII (i.e. Series 8000) limits fugitive dust during the construction phase of a project. Staff recommends that construction emission impacts be mitigated to the greatest feasible extent including all feasible measures from the LORS, as well as other measures considered necessary by staff to fully mitigate the construction emissions.

Applicant's Proposed Mitigation

Based on the assumptions provided with their emission calculations (PEC 2007a, DR 4 and 22) the applicant proposes to control fugitive dust emissions by watering the site at least three times daily, maintaining vehicle speeds on unpaved areas to no more than 10 miles an hour, and using ultra-low sulfur diesel fuel. The fugitive dust control factor assumed by the applicant is 85%. The applicant's construction emissions estimates in **Air Quality Tables 11** to **12** and construction modeling results in **Air Quality Table 19** assume the use of these emission control measures.

[1] The nearest potential receptors during construction, after the existing receptors located across Panoche Road are relocated by agreement with the applicant, will be located approximately 450 meters to the northeast of the fence line. These receptors may also be relocated prior to project construction as part of the Starwood peaking project (06-AFC-10) which has agreed to relocate these residential receptors as part of that project's mitigation. If this were to occur then the nearest residential receptor would be located over a mile from the project site. However, the Starwood project's relocation can not be guaranteed by this applicant.

Adequacy of Proposed Mitigation

The applicant's revised PM10 emission estimate assumes a very aggressive control efficiency factor for fugitive dust (85%) from unpaved roads, which staff believes to be potentially overly optimistic. However, even if the emission and modeling analyses performed by the applicant were assumed to be reasonably accurate, the modeling analysis shows that the mitigated construction PM10 impacts are predicted to be potentially significant beyond the project fence line. Therefore, staff believes that all reasonable feasible construction emission mitigation measures proposed by the applicant are needed to mitigate the potentially significant construction PM10 impacts.

Staff Proposed Mitigation

Staff recommends construction PM10 and NOx emission mitigation measures that include the three mitigation measures proposed by the applicant, and several additional construction PM10 emission mitigation measures and construction equipment mitigation measures to assure maximum feasible fugitive dust control performance and construction equipment exhaust emissions control, as well as, compliance assurance measures in Conditions of Certification **AQ-SC1** through **AQ-SC5**.

Staff recommends **AQ-SC1** to require the applicant to have an on-site construction mitigation manager who will be responsible for the implementation and compliance of the construction mitigation program. The documentation of the ongoing implementation and compliance with the construction mitigation program would be provided in the monthly construction compliance report that is required in staff's recommended Condition of Certification **AQ-SC2**.

Staff recommends fugitive dust mitigation measures be provided in Condition of Certification **AQ-SC3**. **AQ-SC3** includes the following fugitive dust control measures:

- All unpaved roads and disturbed areas in the project and linear construction sites shall be watered as frequently as necessary to comply with the dust mitigation objectives of AQ-SC4. The frequency of watering may be reduced or eliminated during periods of precipitation.
- No vehicle shall exceed 10 miles per hour within the construction site.
- The construction site entrances shall be posted with visible speed limit signs.
- All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.
- Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.
- All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.
- All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM.

- Construction areas adjacent to any paved roadway shall be provided with sandbags or other measures as specified in the Storm Water Pollution Prevention Plan (SWPPP) to prevent run-off to roadways.
- All paved roads within the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.
- At least the first 500 feet of any public roadway exiting from the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff from the construction site is visible on the public roadways.
- All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or shall be treated with appropriate dust suppressant compounds.
- All vehicles that are used to transport solid bulk material on public roadways and that have the potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least two feet of freeboard.
- Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

Staff recommends Condition of Certification **AQ-SC4** to limit the potential offsite impacts from visible dust emissions from the construction activities.

Staff recommends Condition of Certification **AQ-SC5** to mitigate the emissions from the large diesel-fueled construction equipment. This condition requires the use of EPA/ARB Tier 2 engine compliant equipment for equipment over 100 horsepower where available and includes equipment idle time restrictions. The Tier 2 standards include engine emission standards for NOx plus non-methane hydrocarbons, CO, and PM emissions. The Tier 2 standards became effective for engine/equipment model years 2001 to 2003 for engines between 100 and 750 horsepower.

Staff recommends Condition of Certification **AQ-SC6** to formalize the applicant's proposal (PEC 2007a, DR 41) to relocate the residents that are located across Panoche Road from the site area prior to the initiation of onsite construction activities.

Due to the worst-case PM10 impacts identified for project construction, the very fine soils at the site that will exacerbate dust formation, and the existing serious PM10 nonattainment status in the project site area, staff has recommended requiring all feasible construction emission mitigation measures. Based on the relatively short-term nature of the worst-case construction impacts, and staff's recommendation of requiring all feasible construction emission mitigation measures, staff believes that the construction air quality impacts will be less than significant with the implementation of the mitigation measures contained in the recommended Conditions of Certification.

Operation Impacts and Mitigation

The following section discusses the project's direct ambient air quality impacts, as estimated by the applicant, and evaluated by staff. Additionally, this section discusses the recommended mitigation measures.

The applicant performed direct impact modeling analyses, including operations, fumigation, and commissioning impact modeling.

Operational Modeling Analysis

A refined modeling analysis was performed to identify off-site criteria pollutant impacts from operational emissions of the proposed project. Turbine emission rates were first calculated from equipment vendor estimates for ten operating conditions:

- Three load cases, 50% load, 75% load, and 100% load.
- Each load case was evaluated at three different ambient conditions, winter minimum, yearly average, and summer maximum.
- The 100% summer maximum condition included two separate cases, one with an evaporative cooler on and one without the evaporative cooler on.

These conditions were then modeled to determine the worst case short term conditions and the assumptions to be used for the stack parameters to be used in the modeling analysis. The firewater pump engine and cooling tower emissions were included in the normal operational impact modeling analysis based on their emissions, prorated as necessary, shown previously in **Air Quality Table 17**.

The ISC-PRIME model (Version 04269) was used for the modeling analysis. The applicant's predicted maximum concentrations of the non-reactive pollutants for the PEC are summarized in **Air Quality Table 19.**

Air Quality Table 19
PEC Normal Operating Impacts, (μg/m^3)

Pollutant	Averaging Period	Project Impact (μg/m^3)	Background (μg/m^3) [a]	Total Impact (μg/m^3)	Limiting Standard (μg/m^3)	Type of Standard	Percent of Standard
NO_2	one-hour	136.0 [b]	157.9	293.9	470	CAAQS	63
	annual	0.12	32.1	32.2	100	NAAQS	32
PM10	24-hour	2.83	109	111.8	50	CAAQS	224
	annual	0.52	35	35.5	20	CAAQS	178
PM2.5	24-hour	2.83	69	71.8	35	NAAQS	205
	annual	0.52	19.7	20.2	12	CAAQS	169
CO	one-hour	350.72 [c]	4,715	5,066	23,000	CAAQS	22
	eight-hour	192.57 [b]	3,278	3,471	10,000	CAAQS	35
SO_2 [d]	one-hour	2.10	23.6	25.7	655	CAAQS	4
	three-hour	1.57	21.2	22.8	1,300	NAAQS	2
	24-hour	0.57	10.5	11.1	105	CAAQS	11
	annual	0.02	5.3	5.3	80	NAAQS	7

Source: (PEC 2007a, DR 4 and 22; PEC 2007f, DR 4 and 22 follow-up).
[a] Background values have been adjusted per staff recommended background concentrations shown in **AIR QUALITY Table 10**.
[b] This maximum impact is a fence line impact from the firewater pump engine, approximately 60 meters away. The normal operating maximum impacts from the gas turbines when the engine is not operating will be lower than this value.
[c] The applicant did not model normal operating emissions for CO, these results are the initial commissioning results.
[d] These modeling results are based on the gas turbine fuel having a natural gas fuel sulfur content of 0.75 grains per 100 SCF, which is lower than the value of 1.0 grains per 100 SCF used by SJVAPCD in the PDOC and higher than the average fuel sulfur content for PG&E which is closer to 0.3 grains per 100 SCF.

The applicant's modeling results indicate that the project's normal operational impacts would not create violations of NO_2, SO_2 or CO standards, but could further exacerbate violations of the PM10 and PM2.5 standards. In light of the existing PM10 and PM2.5 non-attainment status for the project site area, staff considers the modeled impacts to be significant and, therefore, require mitigation as proposed below.

Fumigation Modeling Impact Analysis

There is the potential that higher short-term concentrations may occur during fumigation conditions. During the early morning hours before sunrise, the air is usually very stable. During such stable meteorological conditions, emissions from elevated stacks rise through this stable layer and are dispersed. When the sun first rises, the air at ground level is heated, resulting in a vertical (both rising and sinking air) mixing of air for a few hundred feet or so. Emissions from a stack that enter this vertically mixed layer of air will also be vertically mixed, bringing some of those emissions down to the ground level. Later in the day, as the sun continues to heat the ground, this vertical mixing layer becomes higher and higher, and the emissions plume becomes better dispersed. The early morning pollution event, called fumigation, usually lasts approximately 30 to 90 minutes.

Fumigation conditions are generally only compared to one-hour standards. The applicant analyzed the maximum one-hour and three-hour air quality impacts under

fumigation conditions from the CTGs using the SCREEN3 model (PEC 2006a, p. 5.2-26). The results of the analysis, as shown in **Air Quality Table 20**, indicate that the fumigation impacts would be lower than the maximum normal operating emission impacts.

Air Quality Table 20
Maximum PEC Fumigation Impacts, (μg/m^3)

Pollutant	Averaging Period	Project Impact (μg/m^3)	Background (μg/m^3) [a]	Total Impact (μg/m^3)	Limiting Standard (μg/m^3)	Type of Standard	Percent of Standard
NO_2	one-hour	6.7 [b]	157.9	164.6	470	CAAQS	35
CO	one-hour	16.2 [c]	4,715	4,731	23,000	CAAQS	21
SO_2	one-hour	0.19	23.6	23.8	655	CAAQS	4

Source: AFC (PEC 2006a) Table 5.2-19.
[a] Background values have been adjusted per staff recommended background concentrations shown in **AIR QUALITY Table 10**.
[b] Prorated from maintenance emission value of 89.9 lbs/hour to startup emission rate of 44.4 lbs/hour.
[c] Prorated from maintenance emission value of 206.6 to startup emission rate of 106.6 lbs/hour.

Maximum fumigation impacts for the turbines were predicted to occur about 16.5 kilometers from the facility (PEC 2006a, Table 5.2-19, p. 5.2-34). The impacts under fumigation conditions are expected to be lower than the maximum concentrations calculated by ISC-PRIME (see **Air Quality TABLE 19**). This is due to the very high stack temperatures which reduce the potential for fumigation.

Startup/Commissioning Short-Term Modeling Impact Analysis

The applicant did not model the worst-case startup NOx and CO emissions, rather the applicant modeled the commissioning emissions, which are higher than the startup emissions to determine worst-case short-term operating impacts for the project. The SO_2 and PM10 emissions and ambient air quality impacts are not forecast to be higher during initial commissioning or startup/shutdown events than they are under normal operation.

The applicant presented several initial commissioning activities that would occur prior to meeting normal emission limits. The worst case conditions for the short-term NOx and CO impacts, as provided in the discussion prior to **Air Quality Tables 13 and 14**, were determined and modeled.

The ISC-PRIME model (version 04269) was used for the applicant's modeling analysis. The results of the commissioning emissions modeling analysis are shown in **Air Quality Table 21.** As shown in the table below the, the worst-case emissions would not cause an exceedance of the one-hour NO_2 standard or the one-hour and eight-hour CO standards. Therefore, the modeling results indicate that the commissioning emissions, and by comparison the startup emission impacts, do not have the potential to cause significant short-term ambient air quality impacts.

Air Quality Table 21
Maximum PEC Initial Commissioning Impacts

Pollutant	Averaging Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$) [a]	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Type of Standard	Percent of Standard
NO_2	one-hour	192.86	157.9	350.8	470	CAAQS	75
CO	one-hour	350.72	4,715	5,066	23,000	CAAQS	22
CO	eight-hour	192.57	3,278	3,471	10,000	CAAQS	35

Source: (PEC 2007a, DR 4 and 22; PEC 2007f, DR 4 and 22 follow-up).
[a] Background values have been adjusted per staff recommended background concentrations shown in **AIR QUALITY Table 10**.

Operations Mitigation

Applicant's Proposed Mitigation

Emission Controls

As discussed in the project description section, the applicant proposes to employ water/steam injection, SCR with ammonia injection, CO catalyst, and operate exclusively on pipeline quality natural gas to limit turbine emission levels (PEC 2006a, p. 5.2-46). The AFC (PEC 2006a, Table 5.2-25, p. 5.2-47) and PDOC (SJVAPCD 2007) provide the following BACT emission limits for the CTGs:

- NOx: 2.5 ppmvd at 15% O_2 (one-hour average, excluding startup/shutdown) and 8.03 lb/hr
- CO: 6.0 ppmvd at 15% O_2 (3-hr rolling average, excluding startup/shutdown) and 11.81 lb/hr
- VOC: 2.0 ppmvd at 15% O_2 and 2.67 lb/hr
- PM10: 6.00 lb/hr
- SO_2: 2.51lb/hr with fuel sulfur content of 1.0 grains/100 scf
- NH_3: 10 ppmvd at 15% O_2 (24-hour rolling average) and 11.90 lb/hr

The cooling tower will control PM10 emissions by having a high efficiency mist eliminator that will control the drift fraction to 0.0005% (PEC2006a, p. 5.2-46).

The firewater pump engine is proposed to meet ARB/USEPA Tier 2 engine standards (PEC2007a, Appendix I, Attachment C). The proposed engine emission standards and the applicable Tier 2 emission standard limits are as follows:

Pollutant	Proposed Engine	Tier 2 Standards
NOx+NMHC	4.9 g/bhp	4.9 g/bhp
CO	0.66 g/bhp	2.6 g/bhp
PM	0.15 g/bhp	0.22 g/bhp

NMHC = Non-methane hydrocarbons
g/bhp = grams/break horsepower

Emission Offsets

District Rule 2201 requires that the applicant provide emission offsets, in the form of banked ERCs, for the project's emissions exceeding the SJVAPCD offset thresholds. The PEC would require offsets for NOx, VOC, and PM10 based on District Rule 2201.

Air Quality Table 22 shows the District's summary of the emission liabilities that need to be offset under Rule 2201 requirements.

AIR QUALITY Table 22
PEC District Offset Calculations (lb/year)

Offsets Triggered?	NOx	VOC	PM10	SO_2	CO [b]
PEC Emissions [a]	193,860	60,696	121,762	50,200	371,000
Offset Threshold	20,000	20,000	29,200	54,750	200,000
Offsets Triggered?	**Yes**	**Yes**	**Yes**	**No**	**No**
Offset Calculations					
Required Offset Ratio [c]	1.5	1.5	1.5 [d]	---	---
PEC ERCs Required [e]	260,790	61,044	138,843	---	---

Source: AFC (PEC 2005a), Table 5.2-37; (PEC 2005g, DR14); and the PDOC (SJVAPCD).
[a] PEC annual emissions do not include emergency equipment which are exempt from District Offset requirements.
[b] Emission offsets are not required for CO in attainment areas since the Applicant has demonstrated to the satisfaction of the Air Pollution Control Officer (APCO) that the AAQS are not violated in the areas to be affected, and such emissions will be consistent with Reasonable Further Progress, and will not cause or contribute to a violation of the AAQS.
[c] Based on assumption that all ERCs are obtained from sources more than 15 miles away.
[d] Distance based offset ratio only. Interpollutant offset ratio for PM10 is discussed separately below.
[e] Calculated as 1.5 times the PEC emissions, where triggered.

All air pollutant offsets provided for the project, by rule, are estimated on a quarterly basis. The applicant is proposing several sources of offsets to mitigate the project's potential emissions. Calculations of the required ERCs are based on the distance of the project from different sources of offsets. For major sources, the District requires a 1.3:1 offsetting ratio for off-site ERCs within 15 miles. For areas outside of the 15 miles, ERCs must be provided at a ratio of 1.5:1. The applicant has assumed that ERCs are obtained from sources more than 15 miles away, and is therefore using a ratio of 1.5:1 (PEC 2007a, DR 10). The District determines appropriate interpollutant offset ratios on a case-by-case basis.

The District subtracts the offset emission threshold prior to determining the total offset need. For this project the offset emission threshold was subtracted after prorating based on the applicant's quarterly operating hours. While this is essentially only an accounting issue for this project, staff has not seen this prorating calculation used before by the SJVAPCD, and Rule 2201 does not provide specific requirements in terms of the quarterly application of the offset emission threshold; therefore, staff included a question regarding the District's policy for emission threshold prorating with other comments on the PDOC.

Energy Commission policy has long held that emission reductions need to be provided for all nonattainment pollutants and their precursors at a minimum 1:1 ratio of annual operating emissions. For this project the District's offset requirements would meet or exceed that minimum offsetting goal for all pollutants other than SO_2, where the no offset are required under District rules. The applicant has proposed to provide SO_2 emission reduction credits to offset the permitted annual SO_2 emissions at a 1:1 ratio.

As shown in **Air Quality Table 23** through **Air Quality Table 26**, the applicant has demonstrated, per District requirements and Energy Commission policy, that it owns ERCs in quantities sufficient to offset the project's NOx, VOC, PM10, and SO_2 emissions.

NOx Emission Offsets

Air Quality Table 23 provides a summary of the total project NOx emissions and identifies the project offset sources. The applicant actually holds additional NOx ERCs, but has identified the specific ERCs that will be used for this project. ERC S-2362-2 was split from an emission reduction source that was generated from the retrofit of stationary reciprocating engines with pre-combustion chambers. ERCs S-2437-2 was split from an emission reduction source that was generated by converting dual fuel (oil/gas) fired steam generators to natural gas only fired steam generators.

AIR QUALITY Table 23
NOx Offsets Available for the PEC [a]

Offset Source Location	Credit Number	Total Q1 (lb)	Total Q2 (lb)	Total Q3 (lb)	Total Q4 (lb)
Elk Hills	S-2362-2	44,094	52,114	52,114	52,114
STR 02/28S/21E, Belridge Field	S-2437-2	22,379	22,627	22,876	22,876
Total ERC Holdings	---	66,476	74,741	74,990	74,990
Total Required @ 1.5:1	---	57,374	57,374	83,453	62,589
Surplus/Deficit	---	9,102	17,367	-8,463	12,401
ERCs from 2nd to 3rd Quarter[a]	---	---	-8,463	8,463	---
Final Surplus	---	9,102	8,904	0	12,401

Sources: (PEC 2007a, DR10; BEC 2007, DR2 and DR4; and SJVAPCD 2007).
[a] Per District Rule 2201 Section 4.13.8 NOx ERCs can be interchanged between the 2nd and 3rd quarters.

The applicant appears to be in compliance with the District's NOx offset requirements and is providing ERCs at a total offset ratio of greater than 1:1 for the PEC project. Staff has determined that this offset proposal satisfies CEQA mitigation requirements.

VOC Emission Offsets

Air Quality Table 24 provides a summary of the total project VOC emissions and identifies the project offset sources. ERC S-2465-1 was split from an emission reduction source that was generated from the modification of a coker to incinerate its exhaust in a carbon monoxide (CO) boiler.

AIR QUALITY Table 24
VOC Offsets Available for the PEC [a]

Offset Source Location	Credit Number	Total Q1 (lb)	Total Q2 (lb)	Total Q3 (lb)	Total Q4 (lb)
Rosedale Hwy, STR 28/29S/27E	S-2465-1	23,306	23,306	23,306	23,306
Total Required @ 1.5:1	---	13,430	13,430	19,534	14,651
Surplus	---	9,876	9,876	13,055	20,345

Source: (PEC 2007a, DR10; BEC 2007, DR2 and DR4; and SJVAPCD 2007).

The applicant is in compliance with the District's VOC offset requirements and is providing ERCs at a total offset ratio of greater than 1:1 for the PEC project (61,044 lbs of ERCs versus 60,703 lbs of emissions). Staff has determined that this offset proposal satisfies CEQA mitigation requirements.

PM10 Emission Offsets

PM10 ERCs were obtained by the applicant but not in sufficient quantities to fully offset the facility, so the applicant has proposed the use of SOx for PM10 interpollutant offsets to complete the PM10 offset package. **Air Quality Table 25** provides a summary of the total project PM10 emissions and identifies the project offset sources. ERC S-2431-4 was generated from the shutdown of a gas turbine. ERCs S-2432-4 through 2436-4 were generated by the shutdown of steam generators.

AIR QUALITY Table 25
PM10 Offsets Available for the PEC

Offset Source Location	Credit Number	Total Q1 (lb)	Total Q2 (lb)	Total Q3 (lb)	Total Q4 (lb)
18405 HWY 33, McKittrick; STR 30/28S/21E	S-2431-4	8,741	7,519	8,213	8,457
Belridge Field, STR 27/28S/21E	S-2432-4	904	923	981	961
STR 29/28S/21E	S-2433-4	3,587	3,857	4,416	4,220
STR 34/28S/21E	S-2434-4	3,382	3,622	3,173	3,855
Belridge Field, STR 29/28S/21E	S-2435-4	0	1,079	1,058	951
Belridge Field, STR 33/28S/21E	S-2436-4	0	686	802	723
Total PM10 ERC Holdings	---	16,614	17,686	18,643	19,167
Total Required @ 1.5:1	---	30,545	30,545	44,430	33,322
Deficit	---	-13,931	-12,859	-25,787	-14,155
Total Surplus SOx ERC Holdings	[a]	51,530	47,310	0	85,656
Total Remaining Required @ 2.8:1 [b]	---	26,009	24,008	48,144	26,427
Surplus/Deficit	---	25,521	23,302	-48,144	59,229
Quarterly Transfer from Q4 to Q3 [c]		---	---	48,144	-48,144
Final SOx Surplus		25,525	23,307	0	11,085

Source: (PEC 2007a, DR10; BEC 2007, DR2 and DR4; and SJVAPCD 2007).
[a] Surplus SOx ERC certificates from **AIR QUALITY Table 26**.
[b] The District approved SOx: PM10 ratio for PEF of 2.8:1, which includes the interpollutant ratio of 1.867:1 and the distance ratio of 1.5:1.
[c] Per District Rule 2201 Section 4.13.7 PM10 ERCs can be interchanged from the 1st and 4th quarters to the 2nd and 3rd quarters. The actual quarterly transfers used may be completed in another manner than shown above, but the result of fully offsetting the PM10 emissions will remain.

The applicant has proposed the use of SOx for PM10 interpollutant offsets. SOx is accepted as one of the major precursors of PM10 and PM2.5 through reaction with ammonia to form ammonium sulfates. Reductions in SO_2, particularly in areas that are ammonia rich such as the SJVAB, will reduce secondary particulate formation. Therefore, interpollutant offsets of SOx for PM10 can be used to reach the goal of mitigating a project's impacts to regional ambient particulate concentrations. The key issue is the determination of an appropriate interpollutant offset ratio, which depends on the existing levels of PM precursors and the general air chemistry of the area in question. The 1.8:1 SOx for PM10 interpollutant ratio originally proposed by the applicant (PEC 2007a, DR3 Attachment C) was reviewed and revised by the District to 1.867:1 (SJVAPCD 2007). The District approves interpollutant offsets on a case by case basis and has provided their analysis of the approved SOx for PM10 offset ratio in Appendix D Attachment 2 of the PDOC (SJVAPCD 2007). The use of SOx for PM10 interpollutant offsets is allowed by District Rule 2201 Section 4.13.3 and SOx for PM10

interpollutant offsets has been used on other projects, including power plant projects in the past.

The Applicant appears to be in compliance with the District's PM10 offset requirements and is providing PM10/PM10 precursor ERCs at a total offset ratio of greater than 1:1 for the PEC project. Staff has determined that this offset proposal satisfies CEQA mitigation requirements.

SO_2 Emission Offsets

Air Quality Table 26 provides a summary of the total project SO_2 emissions and identifies the project offset sources. ERCs N-559-5 and N-591-5 were generated by modifying a sulfuric acid adsorption process.

AIR QUALITY Table 26
SO_2 Offsets Available for the PEC [a]

Offset Source Location	Credit Number	Total Q1 (lb)	Total Q2 (lb)	Total Q3 (lb)	Total Q4 (lb)
16777 S. Howland Rd, Lathrop	N-559-5	1,560	1,560	1,560	1,560
16777 S. Howland Rd, Lathrop	N-591-5	53,530	49,310	0	91,616
Total ERC Holdings	---	55,090	50,870	1,560	93,176
Total Required [b] @ 1:1	---	3,560	3,560	5,180	3,900
Surplus Deficit		51,530	47,310	-3,620	89,276
Quarterly Transfer from Q4 to Q3		---	---	3,620	-3,620
Remaining Surplus	---	51,530	47,310	0	85,656

Source: (PEC 2007a, DR10; BEC 2007, DR2 and DR4).
[a] These ERCs will be used for both the PEC project and the Bullard Energy Center (BEC) project that are being proposed concurrently in Fresno County by the applicant. At this time it is not certain how much of which ERCs will be used for each project.
[b] The quarterly amounts are based on an average fuel sulfur content of 0.32 grains/100 scf of natural gas.

The applicant is not required by the District to provide SO_2 offsets, but is proposing to offset annual SO_2 emissions at a total offset ratio of 1:1 for the PEC project. The applicant has adjusted the emission estimate of SO_2 for this purpose, per staff's suggestion, to reflect the long-term average fuel sulfur content rather than using the worst-case short-term maximum fuel sulfur content. Staff's evaluation of long term natural gas sulfur content data from PG&E, given the project location and likely sources of natural gas, suggests that the applicant's use of 0.32 grains per 100 scf is reasonably conservative for the purposes of determining annual emissions. Additionally, there is an additional real-world safety margin in the emission estimate as it is unlikely that this peaking power plant will operate near its permitted maximum fuel throughput. Therefore, staff has determined that this offset proposal satisfies CEQA mitigation requirements.

Adequacy of Proposed Mitigation

Staff concurs with the District's determination that the project's proposed emission controls/emission levels meets BACT requirements and that the proposed emission levels are reduced to the lowest technically feasible levels. Staff has determined that the proposed emission controls and emission levels, along with the proposed emission offset package, mitigate all project impacts to less than significant.

Staff has made a preliminary determination that the applicant's offset proposal meets both District requirements and CEQA mitigation requirements. Staff's acceptance of this offset package was determined solely based on the merits of this case, including the District offset requirements, the project's emission limits, the specific ERCs proposed, and ambient air quality considerations of the region, and does not in any way provide a precedence or obligation for the acceptance of offset proposals for any other current or future licensing cases. However, there is the potential that USEPA may comment on the suitability of use of specific ERCs, such as the SOx for PM10 interpollutant offset ratio determination. Such comments have been made previously by USEPA on other power plant projects such as the San Joaquin Valley Energy Center, Pastoria and the Pastoria Expansion. Staff may revise its position on the suitability of specific emission reduction credits or the interpollutant offset methods and results depending on a review of any comments received by USEPA.

For combined-cycle projects, staff believes an ammonia slip level of 5 ppm should be required. However, for simple cycle projects, such as PEC, staff agrees that a 10 ppm ammonia slip level is adequate. Thus, staff agrees with the San Joaquin Valley Air Pollution Control District's PDOC permitted ammonia slip level of 10 ppm.

Staff has considered the minority population surrounding the site (see Socioeconomics Figure 1). Since the project's direct air quality impacts have been reduced to less than significant, there is no environmental justice issue for air quality.

Staff Proposed Mitigation

Staff is proposing conditions of certification (**AQ-SC7** and **AQ-SC10**) that would ensure ongoing compliance through the requirement of quarterly reports and ensure that the license is amended as necessary to incorporate changes to the air quality permits. Staff is proposing condition of certification **AQ-SC8** to formalize the applicant's SOx offset proposal.

CUMULATIVE IMPACTS

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

This analysis is primarily concerned with "criteria" air pollutants. Such pollutants have impacts that are usually (though not always) cumulative by nature. Rarely will a project cause a violation of a federal or state criteria pollutant standard. However, a new source of pollution may contribute to violations of criteria pollutant standards because of the existing background sources or foreseeable future projects. Air districts attempt to attain the criteria pollutant standards by adopting attainment plans, which comprise a multi-faceted programmatic approach to such attainment. Depending on the air district, these plans typically include requirements for air offsets and the use of Best Available Control

Technology for new sources of emissions, and restrictions of emissions from existing sources of air pollution.

Much of the preceding discussion is concerned with cumulative impacts. The "Existing Ambient Air Quality" section describes the air quality background in the San Joaquin Valley Air Basin, including a discussion of historic ambient levels for each of the significant criteria pollutants. The "Construction Impacts and Mitigation" section discusses the project's contribution to the local existing background caused by project construction. The "Operation Impacts and Mitigation" section discusses the project's contribution to the local existing background caused by project operation. The following section includes four additional analyses:

- a summary of projections for criteria pollutants by the air district and the air district's programmatic efforts to abate such pollution;
- an analysis of the project's "localized cumulative impacts", the project's direct operating emissions combined with other local major emission sources;
- a discussion of chemically reactive pollution impacts; ozone and PM2.5; and
- a discussion of greenhouse gas reporting.

Summary of Projections

The SJVAPCD is the lead agency for managing air quality and coordinating planning efforts for the portion of Kern County within the SJVAB, so that the ozone and PM10 standards are attained in a timely fashion and attainment with CO standards are maintained. The District is responsible for developing those portions of the State Implementation Plan (SIP) and the Air Quality Management Plan (AQMP), that deal with certain stationary and area source controls and, in cooperation with the transportation planning agencies (TPAs), the development of transportation control measures (TCMs). In this role the SJVAPCD is the agency with principal responsibility for analyzing and addressing cumulative air quality impacts, including the impacts of ambient ozone, particulate matter, and CO. The District has summarized the cumulative impacts of ozone, particulate matter, and CO on the air basin from the broad variety of its sources. Analyses of these cumulative impacts, as well as the measures the District proposes to reduce impacts to air quality and public health, are summarized in four publicly available documents that the District has adopted or will soon adopt. These adopted air quality plans are summarized below.

- **Draft 2007 Ozone Plan** (8-hour ozone plan)
  Link: http://www.valleyair.org/Air_Quality_Plans/AQ_Final_Draft_Ozone2007.htm
- **Extreme Ozone Attainment Demonstration Plan** (revision adopted 10/20/05)
  Link: http://www.valleyair.org/Air_Quality_Plans/AQ_plans_Ozone_Final.htm
- **2003 PM10 Plan and 2006 PM10 Plan** (adopted 2/16/06)
  Link: http://www.valleyair.org/Air_Quality_Plans/AQ_plans_PM_2003PlanTOC.htm
  Link: http://www.valleyair.org/Air_Quality_Plans/06PM10.htm
- **2004 Revisions to the Carbon Monoxide Maintenance Plan** (adopted 7/22/2004)
  Link: http://www.arb.ca.gov/planning/sip/co/co.htm

The District has not yet completed a draft of the PM2.5 attainment plan that is required to be submitted to the USEPA by April 2008. The Extreme Ozone Attainment Demonstration Plan has not and will not be approved by USEPA, as it is based on the federal 1-hour ozone standard that was revoked in 2005. The Draft 2007 Ozone Plan, when finalized, will become the ozone attainment plan for the District. The last federally approved ozone plan for this District is no longer valid, as its timeline has expired, so staff is only summarizing the current draft plans. The 2006 PM10 Plan is currently awaiting approval at ARB for forwarding to the USEPA for their approval. The 2003 PM10 plan was approved by USEPA in 2004, then that plan was amended in 2005, prior to completion of the 2006 PM10 Plan.

Extreme Ozone Attainment Demonstration Plan and Draft 2007 Ozone Plan

Currently, neither of the District's ozone attainment plans are approved by USEPA. The last approved ozone plan is no longer valid, as its timeline has expired. The District submitted the Extreme Ozone Attainment Demonstration Plan to EPA on November 15, 2004. The Plan was under review at USEPA; however, due to the revocation of the national one-hour ozone standard and redesignation of the SJVAB as a serious 8-hour nonattainment area, this plan will never be formally approved.

The 2007 Ozone Plan, like the 1-hour Extreme Ozone Plan is requesting that the SJVAB be reclassified as an extreme nonattainment area. This is being requested as the District believes it needs more time to meet the 8-hour standard, time that is allowed for areas designated as extreme, and that no other measures would allow them to meet an earlier attainment date. The extreme designation will change permitting requirements and definitions, including lowering the threshold for a major source and increasing the minimum offset ratio to 1.5 to 1 assuming that the District cannot prove all major sources have implemented BACT. Other requirements include the expeditious implementation of Reasonably Available Control Technology (RACT). The plan includes a number of control measures to implement the reductions needed for attainment, that include stationary source control measures, as well as, incentive measures, innovative measures, and the implementation of other transportation and engine standard measures from the State and Federal governments. This plan targets NOx and VOC emission reductions from a multitude of stationary source types, such as wineries, feedlots, small combustion sources, gas turbines, IC engines, and various solvent/coating sources. However, the plan would not impact the PEC gas turbines that already need to meet BACT and the emergency engine that would remain exempt from most IC engine provisions.

While there is no USEPA approved ozone attainment plan for the project to conflict or comply with, the project will be required to comply with all District rules and regulations. The SJVAPCD rules and regulations specify the emissions control and offset requirements for new sources such as the PEC. PEC will use BACT to control the project's emissions. In addition, the operational emissions of NOx and VOC are proposed by the applicant to be mitigated by the use of emissions offset credits (ERCs) obtained by the applicant. Since the project will comply with all existing emission control regulations and will fully offset all nonattainment pollutant and precursor emissions, staff believes that the project will not conflict with the District's 2007 Ozone Plan once approved.

2003 PM10 Plan and 2006 PM10 Plan

The District prepared a PM10 Attainment Plan in 2003 which provided for attainment of the PM10 standards by 2010. This plan was approved by the USEPA in 2004. Measures outlined in the Proposed 2003 PM10 Plan to reduce emissions during construction include amendments to Regulation VIII that have been implemented. No other specific measures contained in the plan would appear applicable to the project emission sources. The applicant would be expected to comply with any additional applicable revisions to the Regulation VIII rules that would be implemented prior to the end of the project construction. SJVAPCD rules and regulations specify the emissions control and offset requirements for new sources, such as the PEC. BACT will be implemented, and ERCs to offset PM10 emissions, which would be obtained by the applicant and approved and certified by the SJVAPCD, comply with District rules, so that the project would be consistent with the strategies and future emissions anticipated under the 2003 PM10 Plan.

The District prepared another PM10 plan in 2006. This plan updates the modeling methods and projections used in the 2003 PM10 Plan. The 2006 PM10 Plan was designed to meet all of the following requirements for areas classified as serious nonattainment under the CAA:

- Demonstrate attainment at the earliest practicable date,
- Implement Best Available Control Measures/Technology (BACM/BACT) for all significant sources of PM10 or PM10 precursors,
- Provide annual reductions of at least five percent of PM10 or PM10 precursor emissions based on the most recent inventory until attainment (applies only to areas designated “serious” that have failed to achieve attainment by CAA deadlines),
- Provide quantitative milestones for reasonable further progress,
- Evaluate whether most recent milestone was met, and
- Adopt contingency measures to assure that emission reductions are in place that can be implemented if a milestone is not achieved on schedule.

The 2006 plan relies on a number of federal, state and local (District) control measures to reduce the emission of PM10 and NOx, which has been identified as the most significant PM10 precursor in the SJVAB. Similar to the 2003 Plan the mitigation measures outlined in the 2006 plan do not appear to directly impact the project. Most of the mitigation measures involve mobile source emission reductions and continued implementation of existing rules and regulations. The project will comply with these plans by meeting its permit requirements and following appropriate existing rules and regulations.

Carbon Monoxide Maintenance Plan

The Carbon Monoxide Maintenance Plan applies to ten separate urbanized areas including the Fresno urbanized area. The project site itself is approximately 40 miles west of the Fresno urbanized area; therefore, the plan does not strictly apply to the project area. The project’s construction and operation were not found to cause any new

exceedances of the CO AAQS. The project's generated traffic would be insignificant in comparison with the existing Fresno county traffic and the project's primary emission sources normally emit CO concentrations out of the stack that are below the ambient air quality standards. Therefore, the project would not impact the Carbon Monoxide Maintenance Plan.

Localized Cumulative Impacts

Since the power plant air quality impacts can be reasonably estimated through air dispersion modeling (see Operational Modeling Analysis section) the project contributions to localized cumulative impacts can be estimated. To represent "past" and, to an extent, "present projects" that contribute to ambient air quality conditions, the Commission staff recommends the use of ambient air quality monitoring data (see Environmental Setting section), referred to as the "background". The staff undertakes the following steps to estimate what are additional appropriate "present projects" that are not represented in the background and "reasonably foreseeable projects":

- First, the Commission staff (or the applicant) works with the air district to identify all projects that have submitted, within the last year of monitoring data, new applications for an authority to construct (ATC) or permit to operate (PTO) and applications to modify an existing PTO within six miles of the project site. Based on staff's modeling experience, beyond six miles there is no statistically significant concentration overlap for non-reactive pollutant concentrations between two stationary emission sources.
- Second, the Commission staff (or the applicant) works with the air district and local counties to identify any new area sources within six miles of the project site. As opposed to point sources, area sources include sources like agricultural fields, residential developments or other such sources that do not have a distinct point of emission. New area sources are typically identified through draft or final Environmental Impact Reports (EIR) that are prepared for those sources. The initiation of the EIR process is a reasonable basis on which to determine what is "reasonably foreseeable" for new area sources.
- The data submitted, or generated from the applications with the air district for point sources or initiating the EIR process for area sources provides enough information to include these new emission sources in air dispersion modeling. Thus, the next step is to review the available EIR(s) and permit application(s), determine what sources must be modeled and how they must be modeled.
- Sources that are not new, but may not be represented in ambient air quality monitoring are also identified and included in the analysis. These sources include existing sources that are co-located with or adjacent to the proposed source (such as an existing power plant). In most cases, the ambient air quality measurements are not recorded close to the proposed project, thus a local major source might not be well represented by the background air monitoring. When these sources are included, it is typically a result of there being an existing source on the project site and the ambient air quality monitoring station being more than 2 miles away.
- The modeling results must be carefully interpreted so that they are not skewed towards a single source, in high impact areas near that source's fence line. It is not truly a cumulative impact of the PEC project if the high impact area is the result of

high fence line concentrations from another stationary source and PEC is not providing a substantial contribution to the determined high impact area.

Once the modeling results are interpreted, they are added to the background ambient air quality monitoring data and thus the modeling portion of the cumulative assessment is complete. Due to the use of air dispersion modeling programs in staff's cumulative impacts analysis, the applicant must submit a modeling protocol, based on information requirements for an application, prior to beginning the investigation of the sources to be modeled in the cumulative analysis. The modeling protocol is typically reviewed, commented on, and eventually approved in the Data Adequacy phase of the licensing procedure. Staff typically assists the applicant in finding sources (as described above), characterizing those sources and interpreting the results of the modeling. However, the actual modeling runs are usually left to the applicant to complete. There are several reasons for this; modeling analyses take time to perform and require significant expertise, the applicant has already performed a modeling analysis of the project alone (see Operational Modeling Analysis section), and the applicant can act on its own to modify the project as the results warrant. Once the cumulative project emission impacts are determined, the necessity to mitigate the project emissions can be evaluated, and the mitigation itself can be proposed by staff and//or applicant (see Mitigation section).

The cumulative assessment for the PEC includes the three other sources shown in **Air Quality Table 27**. The original list of possible new sources from the SJVAPCD included 12 sources (PEC 2007a, DR 25). No significant area sources were identified within six miles of the project site. Of the 12 possible new stationary sources identified by SJVAPCD:

- 2 are included in the cumulative modeling analysis (Cal Peak Power Panoche and Wellhead Power Panoche),
- 4 were VOC sources (i.e. gasoline stations) and are not appropriate for modeling,
- 6 were for modifications to existing sources that resulted in either emission reductions, or insignificant increases in criteria pollutants,
- The Starwood Power Plant (Starwood) that is being licensed concurrent with the PEC project, and that was not included in the SJVAPCD list was included in the cumulative modeling analysis.

The applicant obtained stack parameters and emission data from the SJVAPCD and followed the same modeling procedures used for the PEC operating emissions modeling analysis, except used a more recent version ISC-PRIME (Version 04272).

. AIR QUALITY Table 27
Facilities Included in the Cumulative Modeling by the Applicant

Facility	Source Type
Cal Peak Power Panoche	Gas Turbine Peaking Power Plant
Wellhead Power Panoche	Gas Turbine Peaking Power Plant
Starwood Power Plant	Gas Turbine Peaking Power Plant

The results of this modeling effort, **Air Quality Table 28**, show that the PEC will contribute to existing violations of the PM10 and PM2.5 ambient air quality standards. The results also show that the PEC, along with the other three peaking power plants, will not contribute to new AAQS violations for any of the other pollutants modeled.

AIR QUALITY Table 28
Cumulative Impacts Modeling Results (ug/m^3)

Pollutant	Averaging Time	Maximum Modeled Concentration (ug/m^3)	Background[a] (ug/m^3)	Total Impact (ug/m^3)	Limiting AAQS (ug/m^3)	Percent of Limiting Standard
NO_2	one-hour	91.70	157.9	250	470	53%
	annual	0.13	32.1	32.2	100	32%
CO	one-hour	173.81	4,715	4,889	23,000	21%
	eight-hour	81.47	3,278	3,359	10,000	34%
PM10	24-hour	3.30	109	112.3	50	225%
	annual	0.14	35	35.1	20	176%
PM2.5	24-hour	3.30	69	72.3	35	207%
	annual	0.14	19.7	19.8	12	165%
SO_2	one-hour	4.22	23.6	27.8	655	4%
	three-hour	3.07	21.2	24.3	1300	2%
	24-hour	1.04	10.5	11.5	105	11%
	annual	0.023	5.3	5.3	80	7%

Source: PEC Revised Cumulative Assessment (PEC 2007f).
[a] Background concentrations used by staff use more current ambient monitoring data and are therefore in some cases different than those used by the applicant.

The use of the different ISC-PRIME version, version 04272 used for the cumulative modeling assessment versus version 04269 used for the project operational modeling assessment, has resulted in maximum concentrations that in some cases are lower than the results for the project alone. Regardless, it appears certain that the four peaking power facilities modeled do not create significant cumulative impacts.

There is a reasonable potential that construction of this project and the Starwood project (06-AFC-10) will occur at the same time. The cumulative impacts of these two construction activities will somewhat increase downwind pollutant concentration when winds cross from one site to the other. However, the maximum concentrations for both sites occur at the fence line and drop rapidly with distance from the fence line. Since both of these projects would be required to have maximum feasible emission controls these pollutant concentration impacts would not be considered significant. In terms of impacts to the local residents, if both projects are licensed and in construction at the same time then each would be required to relocated nearby receptors, which once relocated would make the nearest residential receptor more than a mile from either site, a distance that would not experience significant pollutant concentrations.

Staff has considered the minority population surrounding the site (see Socioeconomics Figure 1). Since the project's cumulative air quality impacts have been reduced to less than significant, there is no environmental justice issue for air quality.

Chemically Reactive Pollutant Impacts

Ozone Impacts

The project's gaseous emissions of NOx, SO_2, VOC and ammonia can contribute to the formation of secondary pollutants: ozone and PM10/PM2.5.

There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning efforts where hundreds or even thousands of sources are input into the modeling to determine ozone impacts. There are no regulatory agency models approved for assessing single source ozone impacts. However, because of the known relationship of NOx and VOC emissions to ozone formation, it can be said that the emissions of NOx and VOC from the PEC do have the potential (if left unmitigated) to contribute to higher ozone levels in the region. These impacts would be significant because they would contribute to ongoing violations of the state and federal ozone ambient air quality standards.

PM2.5 Impacts

Secondary PM10 formation, which is assumed to be 100% PM2.5, is the process of conversion from gaseous reactants to particulate products. The process of gas-to-particulate conversion, which occurs downwind from the point of emission, is complex and depends on many factors, including local humidity and the presence of air pollutants. The basic process assumes that the SOx and NOx emissions are converted into sulfuric acid and nitric acid first, and then react with ambient ammonia to form sulfate and nitrate. The sulfuric acid reacts with ammonia much faster than nitric acid and converts completely and irreversibly to particulate form. Nitric acid reacts with ammonia to form both a particulate and a gas phase of ammonium nitrate. The particulate phase will tend to fall out, however the gas phase can revert back to ammonia and nitric acid. Thus, under the right conditions, ammonium nitrate and nitric acid establish a balance of concentrations in the ambient air. There are two conditions that are of interest, described as "ammonia rich" and "ammonia poor." The term "ammonia rich" indicates that there is more than enough ammonia to react with all the sulfuric acid and to establish a balance of nitric acid-ammonium nitrate. Further ammonia emissions in this case will not necessarily lead to increases in ambient PM2.5 concentrations. In the case of an "ammonia poor" environment, there is insufficient ammonia to establish a balance and thus additional ammonia will tend to increase PM2.5 concentrations.

The San Joaquin Valley has been the subject of an extensive secondary particulate formation study, the California Regional Particulate Air Quality Study, which has determined that the San Joaquin Valley is ammonia rich. Therefore, the ammonia emissions from the PEC might not lead to substantial further formation of ammonium nitrate or sulfate. While there will certainly be some conversion from the ammonia emitted from the PEC, there is currently no regulatory model that can predict the conversion rate. However, because of the known relationship of NOx and SOx emissions to PM2.5 formation, it can be said that the emissions of NOx and SOx from the PEC do have the potential (if left unmitigated) to contribute to higher PM2.5 levels in the region.

The applicant is proposing to mitigate the project's NOx, VOC, SO_2, and PM10 emissions through the use of emission offsets and limit the ammonia slip emissions to 10 ppm. The NOx, VOC, SO_2, and PM10 offsets are proposed by the applicant to be provided at a minimum 1:1 ratio, and will be higher than 1:1 for PM10, NOx, and VOC as required by District rules. With the proposed emission offsets, it is staff's belief that the project will not cause significant secondary pollutant impacts.

Greenhouse Gas Reporting

Combustion of fossil fuels produces air emissions known as greenhouse gases in addition to the criteria pollutants. These include primarily carbon dioxide, nitrous oxide (N_20, not NO or NO_2, which are commonly know as NOx or oxides of nitrogen), and methane (unburned natural gas). Greenhouse gases are known to contribute to the warming of the earth's atmosphere. Climate change from rising temperatures represents a risk to California's economy, public health, and environment (CEC 2003). In 1998, the Energy Commission identified a range of strategies to prepare for an uncertain climate future, including a need to account for the environmental impacts associated with energy production, planning, and procurement (CEC 1998, p.5). In 2003, the Energy Commission recommended that the state should require reporting of greenhouse gas emissions as a condition of state licensing of new electric generating facilities (CEC 2003, p. 42). Staff recommends condition of certification **AQ-SC9**, which requires the project owner to report the quantities of relevant greenhouse gases emitted as a result of electric power production. Such reporting would be done in accordance with accepted reporting protocols as specified.

The calculations specified in condition of certification **AQ-SC9** are based on standard protocols developed by the Intergovernmental Panel on Climate Change (IPCC), an international scientific body that is responsible for developing a common methodology for developing greenhouse gas inventories for all world governments to follow. The Intergovernmental Panel on Climate Change-approved methodology for calculating the greenhouse gas emissions in an inventory is particular to the type of fossil fuel burned. In their Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual, the Intergovernmental Panel on Climate Change established the factors for oxidation, fuel-based emissions, and global warming potential.

The calculations are for those emissions associated with on-site fuel storage; all fuel combustion associated with the prime mover of the power plant; and the associated emissions of the on-site power transformer equipment (SF_6). The greenhouse gas emissions to be reported in condition of certification **AQ-SC9** are carbon dioxide, methane, nitrous oxide, and sulfur hexafluoride emissions that are directly associated with the production and transmission of electric power.

The California Global Warming Solutions Act of 2006 (AB32) requires the ARB to adopt a statewide greenhouse gas emissions limit equivalent to the statewide GHG emissions levels in 1990 to be achieved by 2020. To achieve this, ARB has a mandate to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions.

The ARB is expected to announce early action GHG reduction measures by July 2007 and establish a statewide emissions cap by January 2008. By January 1, 2008, ARB is

scheduled to adopt regulations requiring mandatory GHG emissions reporting and define the statewide GHG emissions cap for 2020. ARB would adopt a plan by January 1, 2009 that would indicate how emission reductions would be achieved from significant sources of GHGs via regulations, market mechanisms, and other actions. Then, during 2009, ARB staff would draft rule language to implement its plan and hold public workshops on each measure including market mechanisms (ARB, 2006b). Strategies that the state should pursue for managing GHG emissions in California are identified in the California Climate Action Team's Report to the Governor (CalEPA, 2006). Many focus on generally reducing consumption of petroleum across all areas of the California economy. Improvements in transportation energy efficiency (fuel economy) and alternatives to petroleum-based fuels are slated to provide substantial reductions by 2020 (CalEPA, 2006).

The Electricity Greenhouse Gas Emission Standards Act (SB1368[2]) was also enacted in 2006. Among other provisions, it requires a GHG emission standard not to exceed the rate of emissions of GHG for existing combined-cycle natural gas base load generation. At its January 25, 2007 meeting, the CPUC adopted an Emissions Performance Standard for the state's Investor Owned Utilities of 1,100 pounds (0.5 metric tons) CO_2 per megawatt-hour (MWh). The emissions Performance Standard applies to base load power from new power plants, new investments in existing power plants, and new or renewed contracts with terms of five years or more, including contracts with power plants located outside of California.[3] A similar performance standard is undergoing rulemaking by the CEC for the Publicly Owned Utilities, and it should be adopted by June 30, 2007.[4] Staff believes that **AQ-SC9** will report GHG emissions consistent with these regulations.

COMPLIANCE WITH LORS

The San Joaquin Valley Air Pollution Control District submitted a Preliminary Determination of Compliance (PDOC) for the PEC project on May 4, 2007 (SJVAPCD 2007). Compliance with all District Rules and Regulations was demonstrated to the District's satisfaction in the PDOC. The District's PDOC conditions are presented in the Conditions of Certification. The District's Final Determination of Compliance (FDOC) is anticipated to be completed in July 2007. Staff has provided comments on the PDOC to the District for their consideration in a letter dated June 4, 2007. Any substantive revisions in the DOC, or staff understanding of facts presented in this Staff Assessment, that result from the District's response to PDOC comments will be incorporated into the Final Staff Assessment. Any substantive revisions in the DOC will be incorporated into the Final Staff Assessment.

FEDERAL

The District is responsible for issuing the Federal New Source Review (NSR) permit. This project will not require a PSD permit from USEPA prior to initiating construction.

[2] Public Utilities Code § 8340 et seq.

[3] See Rule at http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/64072.htm

[4] See CEC Docket # 06-OIR-1, http://www.energy.ca.gov/ghgstandards/documents.

U.S. EPA may provide comments on the District's PDOC and/or this Staff Assessment. Staff will evaluate any comments received from U.S. EPA and address them in the Final Staff Assessment.

STATE

The applicant will demonstrate that the project will comply with Section 41700 of the California State Health and Safety Code, which restricts emissions that would cause nuisance or injury, with the issuance of the District's Final Determination of Compliance and the Energy Commission's affirmative finding for the project.

LOCAL

The District has issued a PDOC (SJVAPCD 2007), which states that the proposed project is expected to comply with all applicable District rules and regulations.

The District rules and regulations specify the emissions control and offset requirements for new sources such as the PEC. Best Available Control Technology will be implemented, and emission reduction credits (ERCs), proposed by the Applicant and approved and certified by the District, will fully mitigate project nonattainment pollutant (including precursors) emissions so that they would be consistent with the strategies and future emissions anticipated under the Districts air quality attainment and maintenance plans.

As part of the Energy Commission's licensing process, in lieu of issuing a construction permit to the applicant for the PEC, the District will prepare and present to the Commission a DOC, both a PDOC, and after a public comment period, a FDOC. The PDOC was published on May 4, 2007. That document evaluates whether and under what conditions the proposed project will comply with the District's applicable rules and regulations, as described below.

Rule 1080 – Stack Monitoring

This rule grants the Air Pollution Control Officer the authority to request the installation and use of continuous emissions monitors (CEMs), and specifies performance standards for the equipment and administrative requirements for record keeping, reporting, and notification. The PDOC includes conditions to assure compliance with this rule. Compliance is expected.

Rule 1081 – Source Sampling

This rule requires adequate and safe facilities for use in sampling to determine compliance with emission limits, and specifies methods and procedures for source testing and sample collection. The PDOC includes conditions to assure compliance with this rule. Compliance is expected.

Rule 1100 – Equipment Breakdown

This rule defines a breakdown condition, the procedures to follow if one occurs, and the requirements for corrective action, issuance of an emergency variance, and reporting. This rule is applied to the owner of any source operation with air pollution control equipment, or related operating equipment that controls air emissions, or continuous

monitoring equipment. The PDOC includes conditions to assure compliance with this rule. Compliance is expected.

Rule 2010 – Permits Required

This rule requires any person who is building, altering, replacing or operating any source that emits, may emit air contaminants, or may reduce emissions, to first obtain authorization from the District in the form of an Authority to Construct or a Permit to Operate. Obtaining the DOC will assure compliance with this rule.

Rule 2201 – New and Modified Stationary Source Review Rule

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

Section 4.1 – Best Available Control Technology

Best Available Control Technology (BACT) is defined as the most stringent emission limitation or control technique of the following: a) achieved in practice for a category and class of source; b) contained in any State Implementation Plan and that have been approved by the U.S. EPA for a category and class of source; c) contained in an applicable federal New Source Performance Standard; or d) any other emission limitation or control technique that the District's Air Pollution Control Officer (APCO) finds is technologically feasible and is cost effective. BACT is required for any new or modified emission unit that results in an emissions increase of 2.0 lb/day. However, Section 4.2.1 states that BACT is not required for CO emissions from any new or modified emissions unit if those sources emit less than 200,000 lb/year of CO. In the case of PEC, BACT applies for NOx, VOC, CO, SO_2, and PM10 emissions from the natural gas turbines. BACT would not apply to the emergency equipment diesel firewater pump engine, as periodic testing of the unit will not result in daily emissions greater than 2.0 lb/day (PEC 2006a, p. 5.2-46). The District has concluded that the project meets BACT requirements (SJVAPCD 2007). Compliance is expected.

Section 4.5 through 4.13 – Emission Offset Requirements

Section 4.5 specifies that emissions offsets for new or modified sources are required when their emissions are equal to or exceed the following levels:

- Oxides of Nitrogen, NOx – 20,000 lbs/year;
- Volatile Organic Compounds, VOC – 20,000 lbs/year;
- Carbon Monoxide, CO – 200,000 lbs/year;
- PM10 – 29,200 lbs/year;
- Sulfur Oxides, SOx – 54,750 lbs/year.

If constructed, the PEC would exceed all of the above emission levels, except SO_2, if the facility operates for 5,000 hours per year as requested in the Application.

Section 4.6 specifies that emissions offsets are not required for increases of CO in attainment areas, if the applicant demonstrates that the emissions increase will not cause or contribute to a violation of the ambient air quality standards, and that those emissions are consistent with Reasonable Further Progress. The District has evaluated the project's CO emissions and has concluded that they are consistent with Reasonable Further Progress and do not require offsets.

Section 4.8 specifies that the emission offsets provided shall be adjusted according to the distance of the offset from the project proposed site. The ratios are:

- Internal or on-site source – 1 to 1;
- Within 15 miles of the source – 1.2 to 1 (non-major source), 1.3 to 1 (major source); and
- 15 miles or more from the source – 1.5 to 1.

Section 4.13.1 specifies that major sources (defined as those sources that emit greater than 25 tons of NOx and VOC, 100 tons CO, or 70 tons of PM10 and SOx) that are shut down and thus generate an ERC may not be used as an offset for a new major source (like PEC) unless those ERCs are included in an EPA-approved attainment plan.

Section 4.13.3 allows for the use of interpollutant offsets (including PM10 precursors for PM10) on a case-by-case basis, provided that the applicant demonstrates that the emissions increase will not cause a violation of any ambient air quality standard. The ratio for interpollutant trading shall be based on an air quality analysis and shall be equal to or greater than the minimum offsetting requirement (the distance ratios) of this rule (Section 4.8).

Section 4.13.4 requires Actual Emissions Reductions (AER) used as offsets to have occurred during the same calendar quarter as the emissions increases being offset. Exceptions to this rule (4.13.6 through 4.13.9) allow PM emission reductions that occurred from October through March to offset PM emissions occurring anytime during the year, for NOx and VOC emission reductions that occurred from April through November to offset NOx and VOC emissions occurring anytime during the year, and for CO emission reductions that occurred from November through February to offset CO emissions occurring anytime during the year.

The Districts has evaluated the offset need and offset proposal, including evaluating the proposed interpollutant offsets. The District has found that the offset proposal will comply with these regulations (SJVAPCD 2007), mitigating PEC's exceedance of the District's emission levels.

Staff is concerned that the District's approach in using the offset emission thresholds on this project may not comply with Section 4.13.4 requirements; however, this is really only an accounting issue for this project and does not impact overall compliance. Compliance with this rule is expected.

Section 4.14 – Ambient Air Quality Standards

Section 4.14.1 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. The District completed the required modeling analysis and found that the project would comply with this regulation as the emissions would not cause new violations for the attainment pollutants and would not cause a significant increase in PM10 levels. The Districts PM10 modeling determined the following comparison with USEPA PM10 significance levels:

	Significance Level	Facility Impact
PM10 24-hour	5 $\mu g/m^3$	1.2 $\mu g/m^3$
PM10 Annual	1 $\mu g/m^3$	0.13 $\mu g/m^3$

Staff also review the applicant's modeling analysis that indicates no new exceedances of ambient air quality standards. Compliance with this rule is expected.

Section 4.15 – Additional Requirements for new Major Sources and Federal Major Modifications

Section 4.15.2 requires that the owner of a proposed new major source or federal major modification demonstrate to the satisfaction of the District that all major stationary sources subject to emission limitations that are owned or operated by the applicant or any entity controlling or under common control with the applicant in California, are in compliance or on a schedule for compliance with all applicable emission limitations and standards. The District provided the certification of compliance as Attachment E to the PDOC (SJVAPCD). Compliance with this rule has been confirmed.

Section 5.0 – Administrative Requirements

Section 5.8 applies to all power plants proposed to be constructed within the SJVAPCD, where an AFC or a Notice of Intention has been submitted to the CEC. It describes the actions to be taken by SJVAPCD to provide information to CEC and ARB to ensure that District's rules and regulations will be satisfied. After the Application has been submitted to CEC and other responsible agencies, including SJVAPCD, the APCO is required to conduct a Determination of Compliance review, identical to that which would be performed if an Application for an Authority to Construct had been received for the power plant. If the AFC does not meet the requirements of this regulation, then the APCO is required to inform the CEC within 20 calendar days following receipt of the AFC, including specifying what additional information is required. In such an instance, the AFC is considered to be incomplete and returned to the Applicant for resubmittal. With the submittal of the PDOC and anticipated submittal of the FDOC compliance is assumed.

Rule 2520 – Federally Mandated Operating Permits

Rule 2520 requires that a project owner file a Title V Operating Permit from the U.S. 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 the U.S. 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. The PDOC includes conditions to assure compliance with this rule. Compliance is expected.

Rule 2540 – Acid Rain Program

A project greater than 25 megawatts (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 Permit (Rule 2520). Monitoring of the NOx and SOx emissions and a relatively small quantity of SOx allowances (from a national SOx allowance bank) will be required as well as the use of a NOx CEM. The PDOC includes conditions to assure compliance with this rule. Compliance is expected.

Rule 4001 – New Source Performance Standards

Rule 4001 specifies that a project must meet the requirements of the Federal New Source Performance Standards (NSPS), according to Title 40, Code of Federal Regulations, Part 60, Chapter 1. Subpart KKKK, that overrides subpart GG, which pertain to Stationary Gas Turbines, requires that a project meet specific NOx and SO_2 standards, meet continuous emission monitoring system requirements, meet various emission and fuel reporting requirements, and meet specified NOx and SOx performance testing requirements. The District has carefully evaluated this rule in the PDOC (SJVAPCD 2007) and the PDOC includes conditions to assure compliance with this rule. Compliance is expected.

Rule 4002 – National Emission Standards for Hazardous Air Pollutants

Rule 4002 incorporates the National Emission Standards for Hazardous Air Pollutants (HAPs) from Part 61 and Part 63, Chapter I, Subchapter C, Title 40 CFR and applies to major sources of HAPs. The facility is not forecast as a major HAPs source but will be required to perform testing to prove it is not a major HAPs source. The PDOC include a condition to assure compliance with this rule. Compliance is expected.

Rule 4101 – Visible Emissions

Prohibits visible air emissions, other than water vapor, of more than No. 1 on the Ringelmann chart (20% opacity) for more than three minutes in any one-hour. Considering the control equipment (SCR/CO catalyst) on the turbines, and the new engine standards applicable for the firewater pump engine visible emissions are not expected during normal operation of the facility. The PDOC includes conditions to assure compliance with this rule. Compliance is expected.

Rule 4102 – Nuisance

Prohibits any emissions “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 person or public or which cause or have a natural tendency to cause injury or damage to business or property.” The types of emission sources at the facility are not expected to cause the potential for nuisance. The PDOC includes a condition to assure compliance with this rule. Compliance is expected.

Rule 4201 – Particulate Matter Concentration

Limits particulates emissions from any source that emits or may emit dust, fumes, or total suspended particulate matter to less than 0.1 grain per dry standard cubic foot (gr/dscf) of gas calculated to 12% of carbon dioxide. The particulate matter grain loading expected for the proposed facility equipment are all well less than this standard. The PDOC includes a condition to assure compliance with this rule. Compliance is expected.

Rule 4202 – Particulate Matter Emission Rate

This rule limits particulate matter emissions for any source operation, which emits or may emit particulate matter emissions, by establishing allowable emission rates. Calculation methods for determining the emission rate based on process weight are specified. Gaseous and liquid fuels are exempt, so the gas turbines and firewater pump engine are exempt from this rule. The cooling tower is not exempt but will have PM10 emissions that are at least two orders of magnitude under that allowed by this rule. Compliance is expected.

Rule 4301 – Fuel Burning Equipment

Rule 4301 provides limits on the concentration of combustion contaminants and specifies maximum emission rates for NOx, SO_2, and combustion contaminant emissions (particulates) for any fuel burning equipment, except for air pollution control equipment which is exempt. The specified limits are 140 lbs/hour of NOx, calculated as NO_2, 200 lbs/hour of SO_2, 0.1 gr/dscf of gas calculated to 12% of carbon dioxide, and 10 lbs/hour of combustion contaminants. The gas turbines and firewater pump do not meet the definition of fuel burning equipment as stated in this rule and are therefore exempt.

Rule 4702 – Internal Combustion Engines – Phase 2

Limits the emissions of nitrogen oxides (NOx), carbon monoxide (CO), and volatile organic compounds (VOC) from internal combustion engines. This rule applies to any internal combustion engine with a rated brake horsepower greater than 50 horsepower. Emergency equipment is exempt from the requirements of this rule, except Section 6.2.3 that requires operating records to confirm the exemption. The PDOC includes conditions to assure compliance with this rule. Compliance is expected.

Rule 4703 – Stationary Gas Turbines

Limits NOx and CO emissions from stationary gas turbines. Establishes requirements for testing, monitoring, and record keeping for NOx and CO emissions from new or modified stationary gas turbines with a designed power of 0.3 MW or higher and/or a maximum heat input rating of more than 3,000,000 Btu per hour. The use of BACT will ensure that the emission requirements of this rule are met. The PDOC includes conditions to assure compliance with this rule. Compliance is expected.

Rule 4801 – Sulfur Compounds

Limits the emissions of sulfur compounds to no greater than 0.2% by volume calculated as SO_2 on a dry basis averaged over 15 consecutive minutes. The use of pipeline quality natural gas and ARB certified diesel fuel (15 ppm sulfur by weight) will assure

compliance with this rule. The PDOC includes a condition to require ultra low sulfur diesel fuel to assure compliance with this rule. Compliance is expected.

Rule 7012 – Hexavalent Chromium – Cooling Towers

Limits emissions of hexavalent chromium from circulating water in cooling towers and prohibits the use or sale of products containing these compounds for treating cooling tower water. Recordkeeping and monitoring requirements and test methods for determining emission concentration limits are specified. An implementation schedule is also included. Hexavalent chromium is not proposed to be used in the cooling tower and the PDOC includes conditions to assure compliance with this rule. Compliance is expected.

REGULATION VIII - FUGITIVE PM10 PROHIBITIONS

Rule 8011 – General Requirements

Specifies the types of chemical stabilizing agents and dust suppressant materials that can (and cannot) be used to minimize fugitive dust from anthropogenic (man-made) sources. The rule also specifies test methods for determining compliance with visible dust emission (VDE) standards, stabilized surface conditions, soil moisture content, silt content for bulk materials, silt content for unpaved roads and unpaved vehicle/ equipment traffic areas, and threshold friction velocity (TFV). Records shall be maintained only for those days that a control measure was implemented, and kept for one year following project completion to demonstrate compliance. An owner subject to Rule 2520 (Federally Mandated Operating Permits) shall keep such records for five years. A fugitive dust management plan for unpaved roads and unpaved vehicle/ equipment traffic areas is discussed as an alternative for Rule 8061 and Rule 8071. The PDOC includes conditions to assure compliance with Regulation VIII rules. Compliance is expected.

Rule 8021 – Construction, Demolition, Excavation, Extraction and Other Earthmoving Activities

Requires fugitive dust emissions throughout construction activities (from pre-activity to active operations and during periods of inactivity) to comply with the conditions of a stabilized surface area and to not exceed an opacity limit of 20%, by means of water application, chemical dust suppressants, or constructing and maintaining wind barriers. A Dust Control Plan is also required and shall be submitted to the APCO at least 30 days prior to the start of any construction activities on any site that will include 10 acres or more of disturbed surface area for residential developments, 5 acres or more of disturbed surface area for non-residential development, or will include moving, depositing, or relocating more than 2,500 cubic yards per day of bulk materials on at least three days. The PDOC includes conditions to assure compliance with Regulation VIII rules. Compliance is expected.

Rule 8031 – Bulk Materials

Limits the fugitive dust emissions from the outdoor handling, storage and transport of bulk materials. Requires fugitive dust emissions to comply with the conditions of a stabilized unpaved road surface and to not exceed an opacity limit of 20%. 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. The PDOC includes conditions to assure compliance with Regulation VIII rules. Compliance is expected.

Rule 8041 – Carryout and Trackout

Limits carryout and trackout during construction, demolition, excavation, extraction, and other earthmoving activities (Rule 8021), from bulk materials handling (Rule 8031), from paved and unpaved roads (Rule 8061), and from unpaved vehicle and equipment traffic areas (Rule 8071) where carryout has occurred or may occur. Specifies acceptable (and unacceptable) methods for cleanup of carryout and trackout. The PDOC includes conditions to assure compliance with Regulation VIII rules. Compliance is expected.

Rule 8051 – Open Areas

Requires any open area of 0.5 acres or more within urban areas, or three acres or more within rural areas, and contains at least 1,000 square feet of disturbed surface area to comply with the conditions of a stabilized unpaved road surface and to not exceed an opacity limit of 20%, by means of water application, chemical dust suppressants, paving, applying and maintaining gravel, or planting vegetation. The PDOC includes conditions to assure compliance with Regulation VIII rules. Compliance is expected.

Rule 8061 – Paved and Unpaved Roads

Specifies the width of paved shoulders on paved roads and guidelines for medians. Requires gravel, roadmix, paving, landscaping, watering, and/or the use of chemical dust suppressants on unpaved roadways to prevent exceeding an opacity limit of 20%. Exemptions to this rule include “any unpaved road segment with less than 26 annual average daily vehicle trips (AADT).” The PDOC includes conditions to assure compliance with Regulation VIII rules. Compliance is expected.

Rule 8071 – Unpaved Vehicle/Equipment Traffic Areas

This rule intends to limit fugitive dust from any unpaved vehicle and equipment traffic area by using gravel, roadmix, paving, landscaping, watering, and/or the use of chemical dust suppressants to prevent exceeding an opacity limit of 20%. Exemptions to this rule include “unpaved vehicle and equipment traffic areas with less than 50 Average Annual Daily Trips (AADT).” The PDOC includes conditions to assure compliance with Regulation VIII rules. Compliance is expected.

NOTEWORTHY PUBLIC BENEFITS

No air quality related noteworthy public benefits have been identified.

CONCLUSIONS

Staff’s analysis concludes that the PEC would likely comply with all laws, ordinances, regulations and standards and would result in an insignificant impact under CEQA if PEC complies with all staff recommended and District required Conditions of

Certification and provides the emission offsets, in quantities recommended by staff and the District in **AQ-SC8** and **AQ-74** through **AQ-77**, respectively.

Staff has considered the minority population surrounding the site (see Socioeconomics Figure 1). Since the project's direct and cumulative air quality impacts have been reduced to less than significant, there is no environmental justice issue for air quality.

The Staff has proposed a number of permit conditions that are in addition to the permit conditions that the SJVAPCD has proposed. In most cases the staff proposed permit conditions deal with air quality issues that the SJVAPCD are not required to address. The Staff proposed Conditions of Certification are summarized as follows. Conditions **AQ-SC1** through **AQ-SC5** are construction related permit conditions. Condition **AQ-SC6** formalizes the applicant's proposal to re-locate the nearest residents away from the site. Condition **AQ-SC7** provides the administrative procedure requirements for project modifications. Condition **AQ-SC8** provides the additional SOx emission offset requirements. Condition **AQ-SC9** is the Commission Greenhouse Gas reporting requirement. Condition **AQ-SC10** is a quarterly emission reporting requirement augmenting District Condition **AQ-51**.

Conditions **AQ-1** through **AQ-94** are the SJVAPCD permit conditions with staff proposed verification language.

PROPOSED CONDITIONS OF CERTIFICATION

Staff recommends the following conditions of certification to address the impacts associated with the construction and operation of the PEC. These Conditions include the SJVAPCD proposed Conditions from the PDOC, with appropriate staff proposed verification language for each condition, as well as Energy Commission staff proposed conditions. However, the conditions presented below may be revised to address comments on the District's PDOC or on the Preliminary Staff Assessment.

STAFF CONDITIONS

AQ-SC1 Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with conditions AQ-SC3, AQ-SC4 and AQ-SC5 for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM Delegates. The AQCMM and AQCMM Delegates shall have full access to all areas of construction on the project site and linear facilities, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM Delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall not be terminated without written consent of the CPM.

Verification: At least 60 days prior to the start of ground disturbance, the project owner shall submit to the CPM for approval, the name, resume, qualifications, and contact information for the on-site AQCMM and all AQCMM Delegates. The AQCMM and all Delegates must be approved by the CPM before the start of ground disturbance.

AQ-SC2 Air Quality Construction Mitigation Plan (AQCMP): The project owner shall provide an AQCMP, for approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with conditions AQ-SC3, AQ-SC4 and AQ-SC5.

Verification: At least 60 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the CPM for approval. The CPM will notify the project owner of any necessary modifications to the plan within 30 days from the date of receipt. The AQCMP must be approved by the CPM before the start of ground disturbance.

AQ-SC3 Construction Fugitive Dust Control: The AQCMM shall submit documentation to the CPM in each Monthly Compliance Report (MCR) that demonstrates compliance with the following mitigation measures for the purposes of preventing all fugitive dust plumes from leaving the project site and linear facility routes. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

a) All unpaved roads and disturbed areas in the project and linear construction sites shall be watered as frequently as necessary to comply with the dust mitigation objectives of AQ-SC4. The frequency of watering may be reduced or eliminated during periods of precipitation.

b) No vehicle shall exceed 10 miles per hour within the construction site.

c) The construction site entrances shall be posted with visible speed limit signs.

d) All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.

e) Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

f) All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

g) All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM.

h) Construction areas adjacent to any paved roadway shall be provided with sandbags or other measures as specified in the Storm Water Pollution Prevention Plan (SWPPP) to prevent run-off to roadways.

i) All paved roads within the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.

j) At least the first 500 feet of any public roadway exiting from the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff from the construction site is visible on the public roadways.

k) All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or shall be treated with appropriate dust suppressant compounds.

l) All vehicles that are used to transport solid bulk material on public roadways and that have the potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least two feet of freeboard.

m) Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

Verification: The project owner shall include in the MCR (1) a summary of all actions taken to maintain compliance with this condition, (2) copies of any complaints filed with the air district in relation to project construction, and (3) any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM Delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported (1) off the project site or (2) 200 feet beyond the centerline of the construction of linear facilities or (3) within 100 feet upwind of any regularly occupied structures not owned by the project owner indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

Step 1: The AQCMM or Delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or Delegate shall direct implementation of additional methods of dust suppression if Step 1 specified above fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or Delegate shall direct a temporary shutdown of the activity causing the emissions if Step 2 specified above fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or Delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the CPM any directive from the AQCMM or Delegate to shut down an activity, provided that the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

Verification: The AQCMP shall include a section detailing how the additional mitigation measures will be accomplished within the time limits specified.

AQ-SC5 Diesel-Fueled Engines Control: The AQCMM shall submit to the CPM, in the MCR, a construction mitigation report that demonstrates compliance with the following mitigation measures for the purposes of controlling diesel construction-related emissions. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

a) All diesel-fueled engines used in the construction of the facility shall be fueled only with ultra-low sulfur diesel, which contains no more than 15 ppm sulfur.

b) All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.

c) All construction diesel engines, which have a rating of 100 hp or more, shall meet, at a minimum, the Tier 2 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations, Title 13, section 2423(b)(1) unless certified by the on-site AQCMM that such engine is not available for a particular item of equipment. In the event a Tier 2 engine is not available for any off-road engine larger than 100 hp, that engine shall be equipped with a Tier 1 engine. In the event a Tier 1 engine is not available for any off-road engine larger than 100 hp, that engine shall be equipped with a catalyzed diesel particulate filter (soot filter), unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices is “not practical” if, among other reasons:

(1) There is no available soot filter that has been certified by either the California Air Resources Board or U.S. Environmental Protection Agency for the engine in question; or

(2) The construction equipment is intended to be on-site for ten (10) days or less.

(3) The CPM may grant relief from this requirement if the AQCMM can demonstrate that they have made a good faith effort to comply with this requirement and that compliance is not possible.

d) The use of a soot filter may be terminated immediately if one of the following conditions exists, provided that the CPM is informed within ten (10) working days of the termination:

(1) The use of the soot filter is excessively reducing normal availability of the construction equipment due to increased downtime for maintenance, and/or reduced power output due to an excessive increase in backpressure.

(2) The soot filter is causing or is reasonably expected to cause significant engine damage.

(3) The soot filter is causing or is reasonably expected to cause a significant risk to workers or the public.

(4) Any other seriously detrimental cause which has the approval of the CPM prior to the termination being implemented.

e) All heavy earthmoving equipment and heavy duty construction related trucks with engines meeting the requirements of (c) above shall be properly maintained and the engines tuned to the engine manufacturer's specifications.

f) All diesel heavy construction equipment shall not remain running at idle for more than five minutes, to the extent practical.

Verification: The project owner shall include in the MCR (1) a summary of all actions taken to maintain compliance with this condition, (2) copies of all diesel fuel purchase records, (3) a list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that equipment has been properly maintained, and (4) any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC6 The project owner shall ensure that the property, referred to as ML2, located approximately one-half mile north of the project site is vacated prior to the initiation of major construction activities.

Verification: The project owner shall provide a written declaration to the CPM signed by the owner/resident of the property referred to as ML2, that they have vacated the property and that no other parties are residing at that property at least 15 days prior to the initiation of well drilling and/or site grading construction activities; whichever occurs first.

AQ-SC7 The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project air permit. The project owner shall submit to the CPM any modification to any permit proposed by the District or U.S. EPA, and any revised permit issued by the District or U.S. EPA, for the project.

Verification: The project owner shall submit any proposed air permit modification to the CPM within five working days of its submittal either by 1) the project owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified air permits to the CPM within 15 days of receipt.

AQ-SC8 The project owner shall provide emission reduction credits to offset the project's SOx emissions at a ratio of 1:1. These emission reductions in shall be provided in the following quarterly amounts: Q1 – 3,560 lbs; Q2 – 3,560 lbs; Q3 – 5,180 lbs; Q4 – 3,900 lbs. These offsets shall be provided using ERCs N-559-5 and/or N-591-5. Quarterly transfers from quarters 1 and 4 to quarters 2 and 3 are allowed. The project owner shall surrender these ERCs prior to first turbine fire. This condition is in addition to the District offset requirements provided in Conditions of Certification **AQ-74 through AQ-77**.

Verification: The project owner shall submit to the CPM confirmation that the appropriate quantity of SOx ERCs have been surrendered to the District at least 30 days prior to initial startup. If the CPM, in consultation with the District, approves a substitution or modification, the CPM shall file a statement of the approval with the commission docket and mail a copy of the statement to every person on the post-certification mailing list. The CPM shall maintain an updated list of approved ERCs for the project. Quarterly average fuel sulfur data from the most representative gas utility pipeline monitoring station shall be submitted with the Quarterly Operation Reports (**AQ-SC10**) and the applicant shall demonstrate that the actual annual SO2 emissions remain below the 8.1 tons of emissions that have been offset by complying with this condition.

AQ-SC9 Until the California Global Warming Solutions Act of 2006 (AB32) is implemented, the project owner shall participate in the voluntary California Climate Action Registry or report on a quarterly basis to the CPM the quantity of greenhouse gases (GHG) emitted as a direct result of facility electricity production as follows:

The project owner shall maintain a record of fuel use in units of million-Btus (mmBtus) for all fuels burned on site for the purpose of power production. These fuels shall include but are not limited to: (1) all fuel burned in the combustion turbines, (2) HRSGs (if applicable) or auxiliary boiler (if applicable), and (3) all fuels used in any capacity for the purpose of turbine startup, shutdown, operation or emission controls.

The project owner may perform annual source tests of CO_2 and CH_4 emissions from the exhaust stacks while firing the facility's primary fuel, using the following test methods or other test methods as approved by the CPM. The project owner shall produce fuel-based emission factors in units of lbs GHG per mmBtu of fuel burned from the annual source tests. If a secondary fuel is approved for the facility, the project owner may also perform these source tests while firing the secondary fuel.

Pollutant	Test Method
CO_2	EPA Method 3A
CH_4	EPA Method 18 (VOC measured as CH_4)

As an alternative to performing annual source tests, the project owner may use the Intergovernmental Panel on Climate Change (IPCC) Methodologies for Estimating Greenhouse Gas Emissions (MEGGE). If MEGGE is chosen, the project owner shall calculate the CO_2, CH_4 and N_2O emissions using the appropriate fuel-based carbon content coefficient (for CO_2) and the appropriate fuel-based emission factors (for CH_4 and N_2O).

The project owner shall convert the N_2O and CH_4 emissions into CO_2 equivalent emissions using the following IPCC Global Warming Potentials (GWP): 310 for N_2O (1 pound of N_2O is equivalent to 310 pounds of CO_2) and 21 for CH_4.

The project owner shall maintain a record of all SF_6 that is used for replenishing on-site transformers. At the end of each reporting period, the project owner shall total the mass of SF_6 used and convert that to a CO_2 equivalent emission using the IPCC GWP of 23,900 for SF_6.

On a quarterly basis, the project owner shall report the CO_2 and CO_2 equivalent emissions from the described emissions of CO_2, N_2O, CH_4 and SF_6 to the CPM.

Verification: Any greenhouse gas emissions that are reported by the project owner to the California Climate Action Registry or to comply with AB32 rules or pursuant to this condition shall be reported to the CPM as part of the Quarterly and the annual Air Quality Report as required in condition **AQ-SC10**.

AQ-SC10 The project owner shall submit to the CPM Quarterly Operation Reports, following the end of each calendar quarter that include operational and emissions information as necessary to demonstrate compliance with the Conditions of Certification herein. The Quarterly Operation Report will specifically note or highlight incidences of noncompliance.

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

DISTRICT PRELIMINARY DETERMINATION OF COMPLIANCE CONDITIONS (SJVAPCD 2007a)

The SJVACPD permits each device separately, which causes duplication of conditions. Staff has compiled the SJVAPCD conditions to eliminate this duplication, with the gas turbine conditions being followed by the cooling tower conditions, followed by the firewater pump conditions, followed by the facility-wide conditions.

Gas Turbine Conditions

1. **SJVAPCD Permit No. Unit C-7220-1-0:** 100 MW Simple-Cycle Power Generating System #1 Consisting of a General Electric LMS100 Natural Gas-Fired Combustion Turbine Generator Served by a Selective Catalytic Reduction (SCR) System and an Oxidation Catalyst.

2. **SJVAPCD Permit No. Unit C-7220-2-0:** 100 MW Simple-Cycle Power Generating System #2 Consisting of a General Electric LMS100 Natural Gas-Fired Combustion Turbine Generator Served by a SCR System and an Oxidation Catalyst.

3. **SJVAPCD Permit No.** Unit **C-7220-3-0:** 100 MW Simple-Cycle Power Generating System #3 Consisting of a General Electric LMS100 Natural Gas-Fired Combustion Turbine Generator Served by a SCR System and an Oxidation Catalyst.

4. **SJVAPCD Permit No. Unit C-7220-4-0:** 100 MW Simple-Cycle Power Generating System #4 Consisting of a General Electric LMS100 Natural Gas-Fired Combustion Turbine Generator Served by a SCR System and an Oxidation Catalyst.

AQ-1 The owner/operator of the Panoche Energy Center Power Plant (PECPP) shall minimize the emissions from the gas turbine to the maximum extent

possible during the commissioning period. Conditions **AQ-2** through **AQ-12** shall apply only during the commissioning period as defined below. Unless otherwise indicated, Conditions **AQ-13** through **AQ-56** shall apply after the commissioning period has ended. [District Rule 2201]

Verification: The project owner shall provide in the monthly commissioning status report (see the verification for Condition **AQ-7**) information regarding the types and effectiveness of methods used to minimize commissioning period emissions.

AQ-2 Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the PEC construction contractor to insure safe and reliable steady state operation of the gas turbines and associated electrical delivery systems. [District Rule 2201]

Verification: The project owner shall provide written notification to the APCO and the CPM of the expected date of first turbine roll at least 15 days before the first turbine roll.

AQ-3 Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a gas turbine is first fired, whichever occurs first. The commissioning period shall terminate when the plant has completed initial performance testing, completed final plant tuning, and is available for commercial operation. [District Rule 2201]

Verification: The project owner shall provide written notification to the APCO and the CPM of the expected date of first turbine roll at least 15 days before the first turbine roll. The project owner shall provide written notification to the APCO within 5 day after the turbines are available for commercial operation.

AQ-4 At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the combustors of this unit shall be tuned to minimize emissions. [District Rule 2201]

Verification: The project owner shall provide combustor tuning information to demonstrate compliance with this condition, and that information shall be submitted to the CEC CPM as part of the monthly commissioning status report noted in the verification of Condition **AQ-7**.

AQ-5 At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Selective Catalytic Reduction (SCR) system and the oxidation catalyst shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

Verification: The project owner shall provide emission abatement system information (such as dates of catalyst installation and ammonia grid initial operation) to demonstrate compliance with this condition, and that information shall be submitted to the CEC CPM as part of the monthly commissioning status report noted in the verification of Condition **AQ-7**.

AQ-6 Coincident with the steady-state operation of the SCR system and the oxidation catalyst at loads greater than 50% and after installation and tuning of the emission controls, NOx, CO, and VOC emissions from this unit shall comply with the limits specified in Condition **AQ-18**. [District Rule 2201]

Verification: The project owner shall provide NOx, CO, and VOC emissions information for steady-state operations of the SCR system at oxidation catalyst loads greater than 50% once emission controls for NOx, CO, and VOC have been installed and tuned to demonstrate compliance with this condition, and that information shall be submitted to the CEC CPM as part of the monthly commissioning status report noted in the verification of Condition **AQ-7**.

AQ-7 The project owner shall submit a plan to the District at least four weeks prior to the first firing of this unit, describing the procedures to be followed during the commissioning period. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not limited to, the tuning of the combustors, the installation and operation of the SCR system and the oxidation catalyst, the installation, calibration, and testing of the NOx and CO continuous emissions monitors, and any activities requiring the firing of this unit without abatement by the SCR system or oxidation catalyst. [District Rule 2201]

Verification: The project owner shall submit a single commissioning plan to the District and the CPM at least four weeks prior to the first firing of the combustion turbine, describing in detail the procedures to be followed for the turbine. The project owner shall submit, commencing one month from the time of gas turbine first fire, a monthly commissioning status report throughout the duration of the commissioning phase that demonstrates compliance with the commissioning plan and demonstrates compliance with all other substantive requirements listed in Conditions **AQ-1** through **AQ-12**. The monthly commissioning status report shall be submitted to the CPM by the 10th of each month for the previous month, for all months with turbine commissioning activities following the turbine first fire date.

AQ-8 Emission rates from the CTG, during the commissioning period, shall not exceed any of the following limits: NOx (as NO_2) - 187.00 lb/hr; PM10 – 6.00 lb/hr; CO – 309.75 lb/hr; or VOC (as methane) – 6.63 lb/hr. [District Rule 2201]

Verification: The project owner shall provide emissions data to demonstrate compliance with this condition, and that data shall be submitted to the CEC CPM as part of the monthly commissioning status report noted in the verification of Condition **AQ-7**.

AQ-9 During the commissioning period, the project owner shall demonstrate NOx and CO compliance with Condition **AQ-6** through the use of properly operated and maintained continuous emissions monitors and recorders as specified in Condition **AQ-8**. The monitored parameters for this unit shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation). [District Rule 2201]

Verification: The project owner shall provide CEM data to demonstrate compliance with Conditions **AQ-6**, **AQ-8**, and **AQ-18**, and that data shall be submitted to the CEC CPM as part of the monthly commissioning phase status report noted in the verification of Condition **AQ-7**.

AQ-10 The continuous emissions monitors specified in these permit conditions shall be installed, calibrated and operational prior to the first firing of the unit. After first firing, the detection range of the CEMS shall be adjusted as necessary to accurately measure the resulting range of NOx and CO emissions concentrations. [District Rule 2201]

Verification: The project owner shall provide notification to the District and the CPM of the anticipated dates for installation, calibration and testing for the CEMS at least ten (10) days prior to installation. The project owner shall provide a report to the District and CPM for approval demonstrating compliance with CEMS calibration requirements prior to turbine first fire. The project owner shall provide ongoing calibration data in the monthly commissioning status reports (see verification of Condition **AQ-7**).

AQ-11 The total number of firing hours of a CTG unit without abatement of emissions by the SCR system and the oxidation catalyst of units C-7220-1, ‘2, ‘3, and ‘4 shall not exceed 800 hours total during the commissioning period. Such operation of a CTG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system and the oxidation catalyst in place. Upon completion of these activities, the project owner shall provide written notice to the District and the unused balance of the 800 firing hours without abatement shall expire. Records of the commissioning hours of operation for units C-7220-1, ‘2, ‘3, and ‘4 shall be maintained. [District Rule 2201]

Verification: The project owner shall provide to the District and the CPM a reporting of the number of firing hours without abatement for the turbine in the monthly commissioning status reports (see verification of Condition **AQ-7**).

AQ-12 The total mass emissions of NOx, SOx, PM10, CO, and VOC that are emitted during the commissioning period shall accrue towards the consecutive twelve month emission limits specified in Condition **AQ-27**. NOx and CO total mass emissions will be determined from CEMs data and SOx, PM10, and VOC total mass emissions will be calculated. [District Rule 2201]

Verification: The project owner shall provide emissions data to demonstrate compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-13 A selective catalytic reduction (SCR) system and an oxidation catalyst shall serve the gas turbine engine. Exhaust ducting may be equipped (if required) with a fresh air inlet blower to be used to lower the exhaust temperature prior to inlet of the SCR system catalyst. The project owner shall submit SCR and oxidation catalyst design details to the District at least 30 days prior to commencement of construction. [District Rule 2201]

Verification: The project owner shall submit SCR and oxidation catalyst design details that demonstrate compliance with this condition to the APCO and the CPM 30 days prior to commencement of construction.

AQ-14 The project owner shall submit continuous emission monitor design, installation, and operational details to the District at least 30 days prior to commencement of construction. [District Rule 2201]

Verification: The project owner shall submit continuous emission monitor design, installation, and operational details to the APCO and the CPM 30 days prior to commencement of construction.

AQ-15 The project owner shall submit to the District information correlating the NOx control system operating parameters to the associated measured NOx output. The information must be sufficient to allow the District to determine compliance with the NOx emission limits of this permit when no continuous emission monitoring data for NOx is available or when the continuous emission monitoring system is not operating properly. [District Rule 4703]

Verification: The project owner shall compile the required NOx control system and emissions data and submit the information to the CPM and the APCO in the Quarterly Operation Report (**AQ-SC10**).

AQ-16 Combustion turbine generator (CTG) and electrical generator lube oil vents shall be equipped with mist eliminators. Visible emissions from lube oil vents shall not exhibit opacity of 5% or greater, except for a period or periods not exceeding three minutes in any one hour. [District Rules 2201 and 4101]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission to verify the installation and proper operation of the lube oil vent mist eliminators.

AQ-17 The CTG shall be fired exclusively on PUC-regulated natural gas with a sulfur content of no greater than 1.0 grain of sulfur compounds (as S) per 100 dry scf of natural gas. [District Rule 2201 and 40 CFR 60.4330(a)(2)]

Verification: The project owner shall compile the required data on the sulfur content of the natural gas and submit the information to the CPM and the APCO in the Quarterly Operation Report (**AQ-SC10**).

AQ-18 Emission rates from the CTG, except during startup or shutdown periods, shall not exceed any of the following limits: NOx (as NO_2) – 8.03 lb/hr and 2.5 ppmvd @ 15% O_2; SOx (as SO_2) – 2.51 lb/hr; PM10 – 6.00 lb/hr; CO – 11.81 lb/hr and 6.0 ppmvd @ 15% O_2; or VOC (as methane) – 2.67 lb/hr and 2.0 ppmvd @ 15% O_2. NOx (as NO_2) emission limits are one hour rolling averages. All other pollutant emission concentration limits are based on three hour rolling averages. [District Rules 2201 and 4703 and 40 CFR 60.4320(a) & (b)]

Verification: The project owner shall submit to the CPM and APCO CTG emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-19 Ammonia (NH_3) emissions shall not exceed either of the following limits: 11.90 lb/hr or 10 ppmvd @ 15% O_2 (based on a 24 hour rolling average). [District Rules 2201 and 4102]

Verification: The project owner shall submit to the CPM and APCO CTG emissions data demonstrating compliance with this condition, using approved calculation methods (**AQ-30**), as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-20 During periods of startup, CTG exhaust emission rates shall not exceed any of the following limits: NOx (as NO_2) – 44.40 lb/hr, SOx – 2.51 lb/hr, PM10 6.00 lb/hr, CO - 106.60 lb/hr, or VOC - 7.60 lb/hr, based on three hour averages. [District Rules 2201]

Verification: The project owner shall submit to the CPM and APCO CTG emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-21 During periods of shutdown, CTG exhaust emission rates shall not exceed any of the following limits: NOx (as NO_2) – 34.29 lb/hr, SOx – 2.51 lb/hr, PM10 6.00 lb/hr, CO – 268.57 lb/hr, or VOC - 17.14 lb/hr, based on three hour averages. [District Rules 2201]

Verification: The project owner shall submit to the CPM and APCO CTG emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-22 Startup shall be defined as the period of time during which a unit is brought from a shutdown status to its SCR operating temperature and pressure, including the time required by the unit's emission control system to reach full operations. Shutdown shall be defined as the period of time during which a unit is taken from an operational to a non-operational status as the fuel supply to the unit is completely turned off. [District Rules 2201 and 4703]

Verification: The project owner shall submit to the CPM and APCO the CTG startup and shutdown event duration data demonstrating compliance with Condition **AQ-23** as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-23 The duration of each startup or shutdown shall not exceed two hours. Startup and shutdown emissions shall be counted toward all applicable emission limits. [District Rules 2201 and 4703]

Verification: The project owner shall submit to the CPM and APCO the CTG startup and shutdown event duration data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-24 The emission control systems shall be in operation and emissions shall be minimized insofar as technologically feasible during startup and shutdown. [District Rule 4703]

Verification: The project owner shall submit to the CPM and APCO the CTG startup and shutdown emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-25 Daily emissions from the CTG shall not exceed any of the following limits: NOx (as NO_2) – 261.1 lb/day; VOC – 79.1 lb/day; CO – 560.4 lb/day; PM10 – 144.1 lb/day; or SOx (as SO_2) - 60.2 lb/day. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO CTG emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-26 Quarterly hours of operation shall not exceed any of the following: 1st Quarter - 1,100 hours, 2nd Quarter - 1,100 hours, 3rd Quarter - 1,600 hours, or 4th Quarter - 1,200 hours. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO CTG operations data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-27 Annual emissions from the CTG, calculated on a twelve consecutive month rolling basis, shall not exceed any of the following: NOx (as NO_2) - 48,465 lb/year; SOx (as SO_2) - 12,550 lb/year; PM10 - 30,000 lb/year; CO - 92,750 lb/year; or VOC - 15,174 lb/year. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO CTG emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-28 Each one hour period shall commence on the hour. Each one hour period in a three hour rolling average will commence on the hour. The three hour average will be compiled from the three most recent one hour periods. Each one hour period in a twenty-four hour average for ammonia slip will commence on the hour. [District Rule 2201]

Verification: The project owner shall compile required emission compliance data using these standards and shall submit the information to the CPM and the APCO as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-29 Daily emissions will be compiled for a twenty-four hour period starting and ending at twelve-midnight. Each month in the twelve consecutive month rolling average emissions shall commence at the beginning of the first day of the month. The twelve consecutive month rolling average emissions to determine compliance with annual emissions limitations shall be compiled from the twelve most recent calendar months. [District Rule 2201]

Verification: The project owner shall compile required emission compliance data using these standards and submit the information to the CPM and the APCO as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-30 Compliance with the ammonia emission limits shall be demonstrated utilizing one of the following procedures: 1) calculate the daily ammonia emissions using the following equation: (ppmvd @ 15% O_2) = ((a - (b x c/1,000,000)) x (1,000,000 / b)) x d, where a = average ammonia injection rate (lb/hr) / (17 lb/lb mol), b = dry exhaust flow rate (lb/hr) / (29 lb/lb mol), c = change in measured NOx concentration ppmvd @ 15% O_2 across the catalyst, and d =

correction factor. The correction factor shall be derived annually during compliance testing by comparing the measured and calculated ammonia slip; 2.) Utilize another District-approved calculation method using measured surrogate parameters to determine the daily ammonia emissions in ppmvd @ 15% O_2. If this option is chosen, the project owner shall submit a detailed calculation protocol for District approval at least 60 days prior to commencement of operation; 3.) Alternatively, the project owner may utilize a continuous in-stack ammonia monitor to verify compliance with the ammonia emissions limit. If this option is chosen, the project owner shall submit a monitoring plan for District approval at least 60 days prior to commencement of operation. [District Rule 2201]

Verification: The project owner shall submit for approval their proposed ammonia calculation procedure using one of the methods identified above to the CPM and the APCO for approval 15 days prior to turbine first fire, and then submit to the CPM and APCO for approval any requested modifications to the calculation procedure, not including revised source test correction factors, at least 15 days prior to the Quarterly Operation Report (**AQ-SC10**) where the modified calculation procedure is first used.

AQ-31 Source testing to measure startup and shutdown NOx, CO, and VOC mass emission rates shall be conducted for one of the gas turbines (C-7220-1, C-7220-2, C-7220-3, or C-7220-4) prior to the end of the commissioning period and at least once every seven years thereafter. CEM relative accuracy shall be determined during startup source testing in accordance with 40 CFR 60, Appendix B. If CEM data is not certifiable to determine compliance with NOx and CO startup emission limits, then source testing to measure startup NOx and CO mass emission rates shall be conducted at least once every 12 months. [District Rule 1081]

Verification: The results and field data collected during source tests shall be submitted to the CPM and the District within 60 days of testing. Testing shall be conducted for the CTG upon initial operation, and at least once every seven years.

AQ-32 The project owner shall conduct an initial speciated HAPS and total VOC source test for one of the GTEs (C-7220-1, '2, ‘3 or '4), by District witnessed in situ sampling of exhaust gases by a qualified independent source test firm. PEC shall correlate the total HAPS emissions rate and the single highest HAP emission rate to the VOC mass emission determined during the speciated HAPs source test. Initial and annual compliance with the HAPS emissions limit (25 tpy all HAPs or 10 tpy any single HAP) shall be demonstrated by the combined VOC emissions rates for the GTEs (C-7220-1, '2, ‘3, and '4) determined during initial and annual compliance source testing and the correlation between VOC emissions and HAP(s). [District Rule 4002]

Verification: The results and field data collected during source tests shall be submitted to the CPM and the District within 60 days of testing. The correlated HAPs emission factors determined by these source tests shall be used for annual HAPs emission estimates, used to demonstrate HAPs minor source status, to be provided in the fourth quarter’s Quarterly Operation Reports (**AQ-SC10**).

AQ-33 Source testing to measure the NOx, CO, VOC, and NH_3 emission rates (lb/hr and ppmvd @ 15% O_2) and PM10 emission rate (lb/hr) shall be conducted within 120 days after initial operation and at least once every twelve months thereafter. [District Rules 1081 and 4703 and 40 CFR 60.4400(a)]

Verification: The results and field data collected during source tests shall be submitted to the CPM and the District within 60 days of testing.

AQ-34 The sulfur content of each fuel source shall be: (i) documented in a valid purchase contract, a supplier certification, a tariff sheet or transportation contract or (ii) shall be demonstrated within 60 days after the end of the commissioning period and monitored weekly thereafter. If the sulfur content is demonstrated to be less than 1.0 gr/100 scf for eight consecutive weeks, then the monitoring frequency shall be every six months. If the result of any six month monitoring demonstrates that the fuel does not meet the fuel sulfur content limit, weekly monitoring shall resume. [40 CFR 60.4360, 60.4365(a) and 60.4370(c)]

Verification: The result of the natural gas fuel sulfur monitoring data and other fuel sulfur content source data shall be submitted to the CPM and the APCO in the Quarterly Operation Report (**AQ-SC10**).

AQ-35 The following test methods shall be used: NOx - EPA Method 7E or 20, PM10 - EPA Method 5/202 (front half and back half), CO - EPA Method 10 or 10B, O_2 - EPA Method 3, 3A, or 20, VOC - EPA Method 18 or 25, and ammonia – EPA Method 206. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. The request to utilize EPA approved alternative source testing methods must be submitted in writing and written approval received from the District prior to the submission of the source test plan. [District Rules 1081 and 4703 and 40 CFR 60.4400(1)(i)]

Verification: The project owner shall notify the CPM and the District 30 days prior to any compliance source test. The project owner shall provide a source test plan to the CPM and District for the CPM and District approval 15 days prior to testing.

AQ-36 Fuel sulfur content shall be monitored using one of the following methods: ASTM Methods D1072, D3246, D4084, D4468, D4810, D6228, D6667 or Gas Processors Association Standard 2377. [40 CFR 60.4415(a)(1)(i)]

Verification: The fuel sulfur content data shall be submitted to the CPM and the APCO in the Quarterly Operation Report (**AQ-SC10**).

AQ-37 The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O_2 analyzer during District inspections. The sampling ports shall be located in accordance with the ARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Source Emission Monitoring and Testing. [District Rule 1081]

Verification: Prior to construction of the turbine stacks the project owner shall provide to the CPM for approval detailed plan drawings of the turbine stacks that show the sampling ports and demonstrate compliance with the requirements of this condition. The project owner shall make the site available for inspection of the turbine stacks by representatives of the District, ARB and the Commission.

AQ-38 Compliance demonstration (source testing) shall be District witnessed or authorized and samples shall be collected by a certified testing laboratory. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified 30 days prior to any compliance source test, and a source test plan must be submitted for approval 15 days prior to testing. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]

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

AQ-39 The turbine shall be equipped with a continuous monitoring system to measure and record fuel consumption. [District Rules 2201 and 4703 and 40 CFR 60.4335(b)(1)]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission to verify the continuous monitoring system is properly installed and operational.

AQ-40 The owner or operator shall install, certify, maintain, operate and quality-assure a Continuous Emission Monitoring System (CEMS) which continuously measures and records the exhaust gas NOx, CO and O_2 concentrations. Continuous emissions monitor(s) shall be capable of monitoring emissions during normal operating conditions, and during startups and shutdowns provided the CEMS pass the relative accuracy requirement for startups and shutdowns specified herein. If relative accuracy of CEMS cannot be demonstrated during startup conditions, CEMS results during startup and shutdown events shall be replaced with startup emission rates obtained from source testing to determine compliance with emission limits contained in this document. [District Rules 1080, 2201 and 4703 and 40 CFR 60.4335(b)(1)]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission to verify the continuous monitoring system is properly installed and operational.

AQ-41 The CEMS shall complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period or shall meet equivalent specifications established by mutual agreement of the District, the ARB and the EPA. [District Rule 1080 and 40 CFR 60.4345(b)]

Verification: The project owner shall submit to the CPM and APCO CEMS audits demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-42 The NOx, CO and O_2 CEMS shall meet the requirements in 40 CFR 60, Appendix F Procedure 1 and Part 60, Appendix B Performance Specification 2 (PS 2), or shall meet equivalent specifications established by mutual agreement of the District, the ARB, and the EPA. [District Rule 1080 and 40 CFR 60.4345(a)]

Verification: The project owner shall submit to the CPM and APCO CEMS audits demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-43 Audits of continuous emission monitors shall be conducted quarterly, except during quarters in which relative accuracy and total accuracy testing is performed, in accordance with EPA guidelines. The District shall be notified prior to completion of the audits. Audit reports shall be submitted along with quarterly compliance reports to the District. [District Rule 1080]

Verification: The project owner shall submit to the CPM and APCO the CEMS audits demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-44 The owner/operator shall perform a relative accuracy test audit (RATA) for the NOx, CO, and O_2 CEMs as specified by 40 CFR Part 60, Appendix F, 5.11, at least once every four calendar quarters. The project owner shall comply with the applicable requirements for quality assurance testing and maintenance of the continuous emission monitor equipment in accordance with the procedures and guidance specified in 40 CFR Part 60, Appendix F. [District Rule 1080]

Verification: The project owner shall submit to the CPM and APCO CEMS audits demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-45 Results of the CEM system shall be averaged over a one hour period for NOx emissions and a three hour period for CO emissions using consecutive 15-minute sampling periods in accordance with all applicable requirements of CFR 60.13. [District Rule 4703 and 40 CFR 60.13]

Verification: The project owner shall submit to the CPM and APCO emission data required in the Quarterly Operation Reports (**AQ-SC10**) that follows the definitions of this condition.

AQ-46 Excess emissions shall be defined as any operating hour in which the 4-hour or 30-day rolling average NOx concentration exceeds applicable emissions limit and a period of monitor downtime shall be any unit operating hour in which sufficient data are not obtained to validate the hour for either NOx or O_2 (or both). [40 CFR 60.4380(b)(1)]

Verification: The project owner shall submit to the CPM and APCO emission data and monitor downtime data in the Quarterly Operation Reports (**AQ-SC10**) that follows the definitions of this condition.

AQ-47 Results of continuous emissions monitoring shall be reduced according to the procedure established in 40 CFR, Part 51, Appendix P, paragraphs 5.0 through 5.3.3, or by other methods deemed equivalent by mutual agreement with the District, the ARB, and the EPA. [District Rule 1080]

Verification: The project owner shall submit to the CPM and APCO emission data required in the Quarterly Operation Reports (**AQ-SC10**) that follows the definitions of this condition.

AQ-48 The facility shall install and maintain equipment, facilities, and systems compatible with the District's CEM data polling software system and shall make CEM data available to the District's automated polling system on a daily basis. [District Rule 1080]

Verification: The project owner shall provide a Continuous Emission Monitoring System (CEMS) protocol for approval by the CPM and the APCO at least 60 days prior to installation of the CEMS. The project owner shall make the site available for inspection of the CEMS by representatives of the District, ARB and the Commission.

AQ-49 Upon notice by the District that the facility's CEM system is not providing polling data, the facility may continue to operate without providing automated data for a maximum of 30 days per calendar year provided the CEM data is sent to the District by a District-approved alternative method. [District Rule 1080]

Verification: The project owner shall provide required non-polled CEM data to the District by a District-approved alternative method.

AQ-50 The owner or operator shall, upon written notice from the APCO, provide a summary of the data obtained from the CEM systems. This summary shall be in the form and the manner prescribed by the APCO. [District Rule 1080]

Verification: The project owner shall submit to the CPM and APCO CEMS summary data upon written notice from the APCO.

AQ-51 The owner or operator shall submit a written report of CEM operations for each calendar quarter to the APCO. The report is due on the 30th day following the end of the calendar quarter and shall include the following: Time intervals, data and magnitude of excess NOx emissions, nature and the cause of excess (if known), corrective actions taken and preventative measures adopted; Averaging period used for data reporting corresponding to the averaging period specified in the emission test period and used to determine compliance with an emissions standard; Applicable time and date of each period during which the CEM was inoperative (monitor downtime), except for zero and span checks, and the nature of system repairs and adjustments; A negative declaration when no excess emissions occurred. [District Rule 1080 and 40 CFR 60.4375(a) and 60.4395]

Verification: The project owner shall submit to the CPM and APCO the CEMS audits demonstrating compliance with this condition as part of the Quarterly Operation Report required by this condition and condition **AQ-SC10**.

AQ-52 APCO or an authorized representative shall be allowed to inspect, as determined to be necessary, the required monitoring devices to ensure that such devices are functioning properly. [District Rule 1080]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission to verify monitoring devices are functioning properly.

AQ-53 The project owner shall notify the District of any breakdown condition as soon as reasonably possible, but no later than one hour after its detection, unless the owner or operator demonstrates to the District's satisfaction that the longer reporting period was necessary. [District Rule 1100, 6.1]

Verification: The project owner shall comply with the notification requirements of the District and submit written copies of these notification reports to the CPM and the APCO as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-54 The District shall be notified in writing within ten days following the correction of any breakdown condition. The breakdown notification shall include a description of the equipment malfunction or failure, the date and cause of the initial failure, the estimated emissions in excess of those allowed, and the methods utilized to restore normal operations. [District Rule 1100, 7.0]

Verification: The project owner shall comply with the notification requirements of the District and submit written copies of these notification reports to the CPM and the APCO as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-55 The project owner shall maintain the following records: date and time, duration, and type of any startup, shutdown, or malfunction; performance testing; evaluations, calibrations, checks, adjustments, any period during which a continuous monitoring system or monitoring device was inoperative, and maintenance of any continuous emission monitor. [District Rules 1080, 2201, and 4703 and 40 CFR 60.8(d)]

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

AQ-56 The project owner shall maintain the following records: quarterly hours of operation, fuel consumption (scf/hr and scf/rolling twelve month period), continuous emission monitor measurements, calculated ammonia slip, and calculated NOx mass emission rates (lb/hr and lb/twelve month rolling period). [District Rules 2201 and 4703]

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

SJVAPCD Permit No. Unit C-7220-5-0: 160 BHP John Deere Model 6068T, or Equivalent, Tier 2 Certified Diesel-Fired Emergency IC Engine Powering a Firewater Pump

AQ-57 The project owner shall obtain written District approval for the use of any equivalent equipment not specifically approved in the District's Determination of Compliance. Approval of the equivalent equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate equipment is equivalent to the specifically authorized equipment. [District Rule 2201]

Verification: The project owner shall obtain CPM and APCO approval for the use of any equivalent IC engine not specifically approved in the District's Determination of Compliance. Approval of an equivalent IC engine shall only be made after the CPM and APCO determine that the submitted design and performance data for the proposed IC engine is at least equivalent to the approved IC engine. [District Rule 2201]

AQ-58 The project owner's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2201]

Verification: The project owner shall submit a request for approval including specific design and performance data for an equivalent emergency firewater pump IC engine not specifically approved in the Determination of Compliance to the APCO and the CPM at least 90 days prior to the installation of the emergency firewater pump IC engine.

AQ-59 Alternate equipment shall be of the same class and category of source as the equipment authorized by the Determination of Compliance. [District Rule 2201] N

Verification: The project owner shall submit a request for approval including specific design and performance data for an equivalent emergency firewater pump IC engine not specifically approved in the Determination of Compliance to the APCO and the CPM at least 90 days prior to the installation of the emergency firewater pump IC engine.

AQ-60 No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]

Verification: The project owner shall submit a request for approval including specific design and performance data for an equivalent emergency firewater pump IC engine not specifically approved by the Determination of Compliance to the APCO and the CPM at least 90 days prior to the installation of the emergency firewater pump IC engine.

AQ-61 The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap, roof overhang, or any other obstruction. [District Rule 4102]

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

AQ-62 Only ARB certified diesel fuel containing not more than 0.0015% sulfur by weight is to be used. [District Rules 2201 and 4801 and 17 CCR 93115]

Verification: The project owner shall compile the data on the sulfur content of the diesel fuel received and submit the information to the CPM and the APCO in the Quarterly Operation Report (**AQ-SC10**).

AQ-63 This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO approved alternative. [District Rule 4702 and 17 CCR 93115]

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

AQ-64 Emissions from this IC engine shall not exceed any of the following limits: 4.5 g-NOx/bhp-hr, 0.6 g-CO/bhp-hr, or 0.4 g-VOC/bhp-hr. [District Rule 2201 and 13 CCR 2423 and 17 CCR 93115]

Verification: The project owner shall submit to the CPM and APCO IC engine manufacturer guaranteed emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**) and shall maintain this record for inspection at the site as long as the engine is in service.

AQ-65 Emissions from this IC engine shall not exceed 0.15 g-PM10/bhp-hr based on USEPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102 and 13 CCR 2423 and 17 CCR 93115]

Verification: The project owner shall submit to the CPM and APCO IC engine emissions data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-66 This engine shall be operated only for maintenance, testing, required regulatory purposes, and during emergency situations. For testing purposes, the engine shall only be operated the number of hours necessary to comply with the testing requirements of the National Fire Protection Association (NFPA) 25 - "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems", 1998 edition. Total hours of operation for all maintenance, testing, and required regulatory purposes shall not exceed 52 hours per calendar year. [District Rule 4702 and 17 CCR 93115]

Verification: The project owner shall submit to the CPM and APCO firewater pump IC engine operations data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-67 The project owner shall maintain monthly records of emergency and non-emergency operation. Records shall include the number of hours of emergency operation, the date and number of hours of all testing and maintenance operations, and the purpose of the operation (for example: load testing, weekly testing, rolling blackout, general area power outage, etc.). For

units with automated testing systems, the operator may, as an alternative to keeping records of actual operation for testing purposes, maintain a readily accessible written record of the automated testing schedule. [District Rule 4702 and 17 CCR 93115]

Verification: The project owner shall submit to the CPM and APCO firewater pump IC engine monthly operations data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

SJVAPCD Permit No. Unit C-7220-6-0: 14,300 GPM Induced Draft Cooling Tower Served by a High Efficiency Drift Eliminator

AQ-68 Project owner shall submit cooling tower design details including the cooling tower type, drift eliminator design details, and materials of construction to the District at least 90 days before the tower is operated. [District Rule 7012]

Verification: The project owner shall provide copies of cooling tower and drift eliminator design details to the CPM and the District for approval at least 30 days prior to construction of permanent foundations for the cooling tower.

AQ-69 No hexavalent chromium containing compounds shall be added to cooling tower circulating water. [District Rule 7012]

Verification: The project owner shall provide the list of cooling tower water additives (i.e. biocides, fungicides, anti-scaling compounds, etc.) demonstrating compliance with this condition to the CPM for approval at least 30 days prior to operation of the cooling tower and shall provide any revisions to the cooling tower water additives list to the CPM for approval prior using the new water additive.

AQ-70 Drift eliminator drift rate shall not exceed 0.0005%. [District Rule 2201]

Verification: The project owner shall provide copies of cooling tower and drift eliminator design and manufacturers drift rate guarantee details to the CPM and the District for approval at least 30 days prior to construction of permanent foundations for the cooling tower.

AQ-71 PM10 emission rate from the cooling tower shall not exceed 8.4 lb/day. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO the cooling tower emission data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-72 Compliance with the PM10 daily emission limit shall demonstrated as follows: PM10 lb/day = circulating water recirculation rate x total dissolved solids concentration in the blowdown water x design drift rate. [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO the cooling tower emission data demonstrating compliance with this condition as part of the Quarterly Operation Report (**AQ-SC10**).

AQ-73 Compliance with the PM10 emission limit shall be determined by blowdown water sample analysis by independent laboratory within 120 days of initial operation and quarterly thereafter. [District Rule 1081]

Verification: The results and field data collected from cooling tower blowdown water samples analysis shall be submitted to the CPM and the District as part of the Quarterly Operation Report (**AQ-SC10**).

FACILITY-WIDE CONDITIONS

AQ-74 Prior to initial operation of the facility, the project owner shall provide NOx emission reduction credits for the following quantity of emissions: 1st quarter - 38,249 lb, 2nd quarter - 38,249 lb, 3rd quarter - 55,635 lb, and fourth quarter - 41,726 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 9/21/06). [District Rule 2201]

Verification: At least 60 days prior to commencing CTG first fire, the project owner shall surrender NOx ERC certificates in the amounts shown to the District and provide documentation of that surrender to the CPM.

AQ-75 Prior to initial operation of the facility, the project owner shall provide PM10 emission reduction credits for the following quantity of emissions: 1st quarter - 20,364 lb, 2nd quarter - 20,364 lb, 3rd quarter - 29,620 lb, and fourth quarter - 22,215 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 9/21/06). SOx ERCs may be used to offset PM10 increases at an interpollutant ratio of 1.867 lb-SOx : 1.0 lb-PM10. [District Rule 2201]

Verification: At least 60 days prior to commencing CTG first fire, the project owner shall surrender PM10 and/or SOx ERC certificates in the amounts shown or based on the SOx interpollutant ratio shown to the District and provide documentation of that surrender to the CPM.

AQ-76 Prior to initial operation of the facility, the project owner shall provide VOC emission reduction credits for the following quantity of emissions: 1st quarter – 8,953 lb, 2nd quarter – 8,953 lb, 3rd quarter - 13,023 lb, and fourth quarter - 9,767 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 9/21/06). [District Rule 2201]

Verification: At least 60 days prior to commencing CTG first fire, the project owner shall surrender VOC ERC certificates in the amounts shown to the District and provide documentation of that surrender to the CPM.

AQ-77 ERC Certificate Numbers S-2437-2, S-2362-2, S-2431-4, S-2432-4, S-2433-4, S-2434-4, S-2436-4, S-2435-4, N-559-5, N-591-5, S-2465-1 (or certificates split from these certificates) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Demonstration of Compliance shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Demonstration of Compliance. [District Rule 2201]

Verification: At least 60 days prior to commencing CTG first fire, the project owner shall surrender ERC certificates in the amounts shown to the District and provide documentation of that surrender to the CPM.

AQ-78 The project owner shall submit an application to comply with Rule 2520 - Federally Mandated Operating Permits within twelve months of commencing operation. [District Rule 2520]

Verification: The project owner shall submit a copy of their Title V – Federal Mandated Operating Permit Application to the CPM within 12 months of commencing operation.

AQ-79 The project owner shall submit an application to comply with Rule 2540 - Acid Rain Program. [District Rule 2540]

Verification: The project owner shall submit to the CPM copies of the Title IV permit at least fifteen (15) days prior to the initial firing of the CTG, and shall submit proof that necessary Title IV SO_2 emission allotments have been acquired as necessary for compliance with Title IV requirements annually in the first Quarterly Compliance Report (**AQ-SC10**) that is due after the annual SO_2 allotment due date.

AQ-80 All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201]

Verification: The project owner shall submit maintenance records for all equipment to the CPM and the APCO in the Quarterly Operation Report (**AQ-SC10**).

AQ-81 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

Verification: The project owner will document any complaints that it has received from the public in the Quarterly Operation Report (**AQ-SC10**). The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission.

AQ-82 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]

Verification: The project owner shall document any known opacity violations in the Quarterly Operation Report (AQ-SC10). The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission.

AQ-83 Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Verification: The project owner shall submit the results of the initial and annual source tests per Condition **AQ-33**.

AQ-84 All records shall be maintained and retained on-site for a period of at least 5 years and shall be made available for District inspection upon request. [District Rules 1070, 2201, and 4703]

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

AQ-85 Disturbances of soil related to any construction, demolition, excavation, extraction, or other earthmoving activities shall comply with the requirements for fugitive dust control in District Rule 8021 unless specifically exempted under Section 4.0 of Rule 8021 or Rule 8011. [District Rules 8011 and 8021]

Verification: The project owner shall document compliance with Rule 8021 in the Monthly Compliance Report (**AQ-SC3**), and as necessary after construction is complete in the Quarterly Operation Report (**AQ-SC10**).

AQ-86 An owner/operator shall submit a Dust Control Plan to the APCO prior to the start of any construction activity on any site that will include 10 acres or more of disturbed surface area for residential developments, or 5 acres or more of disturbed surface area for non-residential development, or will include moving, depositing, or relocating more than 2,500 cubic yards per day of bulk materials on at least three days. [District Rules 8011 and 8021]

Verification: The project owner shall submit a Dust Control Plan to the CPM and APCO at least 30 days prior to the start of any construction activities to show compliance with this condition and Condition **AQ-SC2**.

AQ-87 An owner/operator shall prevent or cleanup any carryout or trackout in accordance with the requirements of District Rule 8041 Section 5.0, unless specifically exempted under Section 4.0 of Rule 8041 (8/19/04) or Rule 8011(8/19/04). [District Rules 8011 and 8041]

Verification: The project owner shall document compliance with Rule 8041 in the Monthly Compliance Report (**AQ-SC3)**, and as necessary after construction is complete in the Quarterly Operation Report (**AQ-SC10**).

AQ-88 Whenever open areas are disturbed, or vehicles are used in open areas, the facility shall comply with the requirements of Section 5.0 of District Rule 8051, unless specifically exempted under Section 4.0 of Rule 8051 or Rule 8011. [District Rules 8011 and 8051]

Verification: The project owner shall document compliance with Rule 8051 in the Monthly Compliance Report (**AQ-SC3)**, and as necessary after construction is complete in the Quarterly Operation Report (**AQ-SC10**).

AQ-89 Any paved road or unpaved road shall comply with the requirements of District Rule 8061 unless specifically exempted under Section 4.0 of Rule 8061 or Rule 8011. [District Rules 8011 and 8061]

Verification: The project owner shall document compliance with Rule 8061 in the Monthly Compliance Report (**AQ-SC3)**, and as necessary after construction is complete in the Quarterly Operation Report (**AQ-SC10**).

AQ-90 Water, gravel, roadmix, or chemical/organic dust stabilizers/suppressants, vegetative materials, or other District-approved control measure shall be applied to unpaved vehicle travel areas as required to limit Visible Dust Emissions to 20% opacity and comply with the requirements for a stabilized unpaved road as defined in Section 3.59 of District Rule 8011. [District Rule 8011 and 8071]

Verification: The project owner shall document compliance with Rule 8071 in the Monthly Compliance Report (**AQ-SC3)**, and as necessary after construction is complete in the Quarterly Operation Report (**AQ-SC10**).

AQ-91 Where dusting materials are allowed to accumulate on paved surfaces, the accumulation shall be removed daily or water and/or chemical/organic dust stabilizers/suppressants shall be applied to the paved surface as required to maintain continuous compliance with the requirements for a stabilized unpaved road as defined in Section 3.59 of District Rule 8011 and limit Visible Dust Emissions (VDE) to 20% opacity. [District Rule 8011 and 8071]

Verification: The project owner shall document compliance with Rule 8071 in the Monthly Compliance Report (**AQ-SC3)**, and as necessary after construction is complete in the Quarterly Operation Report (**AQ-SC10**).

AQ-92 On each day that 50 or more Vehicle Daily Trips or 25 or more Vehicle Daily Trips with 3 axles or more will occur on an unpaved vehicle/equipment traffic area, the project owner shall apply water, gravel, roadmix, or chemical/organic dust stabilizers/suppressants, vegetative materials, or other District-approved control measure as required to limit Visible Dust Emissions to 20% opacity and comply with the requirements for a stabilized unpaved road as defined in Section 3.59 of District Rule 8011. [District Rule 8011 and 8071]

Verification: The project owner shall document compliance with Rule 8071 in the Monthly Compliance Report (**AQ-SC3)**, and as necessary after construction is complete in the Quarterly Operation Report (**AQ-SC10**).

AQ-93 Whenever any portion of the site becomes inactive, the project owner shall restrict access and periodically stabilize any disturbed surface to comply with the conditions for a stabilized surface as defined in Section 3.58 of District Rule 8011. [District Rules 8011 and 8071]

Verification: The project owner shall document compliance with Rules 8011 and 8071 in the Monthly Compliance Report (**AQ-SC3)**, and as necessary after construction is complete in the Quarterly Operation Report (**AQ-SC10**).

AQ-94 Records and other supporting documentation shall be maintained as required to demonstrate compliance with the requirements of the rules under Regulation VIII only for those days that a control measure was implemented. Such records shall include the type of control measure(s) used, the location and extent of coverage, and the date, amount, and frequency of application of dust suppressant, manufacturer's dust suppressant product information sheet that identifies the name of the dust suppressant and application instructions.

Records shall be kept for one year following project completion that results in the termination of all dust generating activities. [District Rules 8011, 8031, and 8071]

Verification: The project owner shall document compliance with Regulation VIII rules in the Monthly Compliance Report (**AQ-SC3)**, and as necessary after construction is complete in the Quarterly Operation Report (**AQ-SC10**).

ACRONYMS

AQCMM	Air Quality Construction Mitigation Manager
AQCMP	Air Quality Construction Mitigation Plan
APCO	Air Pollution Control Officer (SJVAPCD)
ARB	California Air Resources Board (also CARB)
AVR	Automatic Voltage Regulator
BACT	Best Available Control Technology
bhp	brake horse power
ARB	California Air Resources Board (also CARB)
CEC	California Energy Commission (or Energy Commission)
CEQA	California Environmental Quality Act
CO	Carbon Monoxide
CTG	Combustion Turbine Generator
CPM	(CEC) Compliance Project Manager
E-stop	Emergency Stop (for gas turbines)
ERC	Emission Reduction Credit
FDOC	Final Determination Of Compliance
gr	Grains (1 gr $\cong$ 0.0648 grams, 7000 gr = 1 pound)
GTE	Gas Turbine Engine
HRSG	Heat Recovery Steam Generator
ISCST3	Industrial Source Complex Short Term, version 3
MMBtu	Million British thermal units
MW	Megawatts (1,000,000 Watts)
NH_3	Ammonia
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen *or* Nitrogen Oxides
NSR	New Source Review
PDOC	Preliminary Determination Of Compliance
PEC	Panoche Energy Center
PM10	Particulate Mater less than 10 microns in diameter
PM2.5	Particulate Mater less than 2.5 microns in diameter
ppm	Parts Per Million
ppmv	Parts Per Million by Volume
ppmvd	Parts Per Million by Volume, Dry
PSA	Preliminary Staff Assessment (this document)
PSD	Prevention of Significant Deterioration
scf	Standard Cubic Feet
SCR	Selective Catalytic Reduction
SIP	State Implementation Plan
SJVAPCD	San Joaquin Valley Air Pollution Control District (also District)
SO_2	Sulfur Dioxide
SO_3	Sulfate
SOx	Oxides of Sulfur
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds

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BIOLOGICAL RESOURCES

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SUMMARY OF CONCLUSIONS

The proposed Panoche Energy Center (PEC) is located in western Fresno County within the northern population of the state threatened, and federally endangered, San Joaquin kit fox (SJKF) (*Vulpes macrotis mutica*), and within an area that has been designated by the U.S. Fish and Wildlife Service (USFWS) to be preserved for the habitat connectivity of this species. Consultation with USFWS under the federal Endangered Species is required. Implementation of the proposed Conditions of Certification presented in this Preliminary Staff Assessment will mitigate impacts to biological resources to less than significant levels. Staff determines that a Biological Assessment must be completed by the applicant and approved by the USFWS so that staff can complete the Final Staff Assessment.

INTRODUCTION

This section provides the California Energy Commission (Energy Commission) staff's preliminary analysis of potential impacts to biological resources from the construction and operation of the PEC as proposed by Panoche Energy Center, LLC (applicant). This analysis addresses potential impacts to state and federally listed species, species of special concern, and other areas of critical biological concern. Information contained in this document includes a detailed description of the existing biotic environment, an analysis of potential impacts to biological resources and, where necessary, specifies mitigation planning and compensation measures to reduce potential impacts to less than significant levels. Additionally, this analysis determines compliance with applicable laws, ordinances, regulations, and standards (LORS), and identifies applicable Conditions of Certification.

This analysis is based, in part, on information provided in the Application for Certification for the PEC, ongoing contact with the applicant, responses to staff data requests, staff site visits conducted on January 19 and February 28, 2007, and discussions with USFWS and California Department of Fish and Game (CDFG).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The applicant shall abide by the following Laws, Ordinances, Regulations, and Standards (LORS) during project construction and operation as listed in **Biological Resources Table 1**.

BIOLOGICAL RESOURCES Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal	
Endangered Species Act (Title 16, United States Code, section 1531 *et seq*.; Title 50, Code of Federal Regulations, part 17.1 *et seq*.)	Designates and provides for the protection of threatened and endangered plant and animal species, and their critical habitat. The administering agency is USFWS.
Migratory Bird Treaty Act (Title 16, United States Code, sections 703-711)	Prohibits the take or possession of any migratory nongame bird (or any part of such migratory nongame bird), including nests with viable eggs. The administering agency is USFWS.
State	
California Endangered Species Act (Fish and Game Code, sections 2050 et seq.)	Protects California's rare, threatened, and endangered species.
California Code of Regulations (Title 14, sections 670.2 and 670.5)	Lists the plants and animals that are classified as rare, threatened, or endangered in California.
Fully Protected Species (Fish and Game Code, sections 3511, 4700, 5050, and 5515)	Designates certain species as fully protected and prohibits take of such species or their habitat. The administering agency is CDFG.
Native Plant Protection Act (Fish and Game Code, section 1900 *et seq*.)	Designates rare, threatened, and endangered plants in California, prohibits the taking of listed plants. The administering agency is CDFG.
Nest or Eggs (Fish and Game Code, section 3503)	Prohibits take, possession, or needless destruction of the nest or eggs of any bird. The administering agency is CDFG.
Migratory Birds (Fish and Game Code, section 3513)	Prohibits take or possession of any migratory nongame bird as designated in the Migratory Bird Treat Act or any part of such migratory nongame bird. The administering agency is CDFG.
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. The administering agency is CDFG.
Local	
Fresno County General Plan – Open Space and Conservation Element	Requires that proposed development projects are compatible with policies set forth in the natural resources section, which provide for the protection and enhancement of fish and wildlife species, riparian and wetland habitats and native vegetation resources.

SETTING

REGIONAL SETTING

The proposed PEC site is located in the western portion of the San Joaquin Valley in an unincorporated area of western Fresno County, approximately 50 miles west of the City of Fresno and two miles east of Interstate 5. Historically, this portion of the San Joaquin Valley contained many natural habitats that supported a variety of native plant and animal species. However, these natural environments have been largely converted to agricultural and urban land uses. Nearby natural areas, where the majority of the special-status species near the proposed project area have been recorded, are located to the south and west of the project area and include Tumey Hills, Panoche Hills, Ciervo Hills, and Monocline Ridge. The nearest natural area is Tumey Hills, located approximately 4.2 miles west of the proposed PEC site.

PROJECT SITE AND VICINITY DESCRIPTION

Near the proposed project, agricultural production is the predominant land use, with other mixed uses including urban areas, industrial, and commercial facilities. The proposed PEC site is located adjacent to the northwest corner of the existing Panoche Substation and two existing power plants. The proposed PEC site (12.8 acres) and laydown area (8 acres) are located within an active pomegranate orchard. The adjacent land uses also support agricultural production and are comprised of active apricot and pomegranate orchards.

Existing Vegetation and Wildlife

The applicant conducted a reconnaissance-level survey of biological resources within the proposed project area and within a 1-mile radius surrounding the proposed project area on April 21, 2006. The survey included an inventory of all plant and wildlife species observed and an assessment of potential habitat suitability for special-status species.

The proposed PEC site and vicinity are highly disturbed due to intensive agricultural operations, including regular herbicide application to manage vegetation in the pomegranate orchard understory. As a result, native plant communities are not present in the project area. Herbaceous cover, when present, is limited to weedy annuals including redstem filaree (*Erodium cicutarium*), common groundsel (*Senicio vulgaris*), foxtail chess (*Bromus madritensis*), and sow-thistle (*Sonchus* sp.). The only native plant species documented during the survey was miner's lettuce (*Claytonia perfoliata*), an understory plant that commonly occurs in orchards within the San Joaquin Valley.

Direct observations in the project area included various non-sensitive wildlife species such as coyote (*Canis latrans*), western toad (*Bufo boreas*), and a variety of bird species typically found in disturbed/developed areas such as house finch (*Carpodacus mexicanus*), northern mocking bird (*Mimus polyglottus*), mourning dove (*Zenaida macroura*), brown-headed cowbird (*Molothrus ater*), killdeer (*Charadrius vociferous*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), American crow (*Corvus branchyrhynchos*), cliff swallow (*Petrochelidon fulva*), and Brewer's blackbird (*Euphagus cyanocephalus*). Additional bird species identified during surveys include red-tailed hawk (*Buteo jamaicensis*), western kingbird (*Tyrannus verticalis*),

American goldfinch (*Carduelis tristis*), and American pipit (*Anthus rubescens*). Agricultural lands provide foraging and breeding habitat for populations of Botta's gophers (*Thomomys bottae*), voles (*Microtus* sp.), western harvest mice (*Reithrodontomys megalotis*), and house mice (*Mus musculus*). The proposed project area is also likely utilized by California ground squirrels (*Spermophilus beecheyi*). Based on the level of disturbance in the area, the proposed PEC site is not expected to support a wide diversity of native wildlife species.

Agricultural land uses have a direct effect upon the type of wildlife species that are likely to use an area. Croplands/orchards are generally found on fertile soils on flat or nearly flat topography that historically supported prime habitat for native species. Although agricultural fields can provide a year-round source of food for various wildlife species, agricultural activities including harvest practices, fencing, trapping, and pesticide/herbicide application can reduce the value of these lands to wildlife. However, these areas may still provide foraging habitat for migrating and resident birds, and various mammals including coyotes and foxes. Suitable habitat for denning and nesting may occur along the weedy edges of fields and irrigation canals as well as in fallow agricultural fields.

Wetlands were not identified within the proposed project area. Two agricultural drainages are located immediately south of the Panoche Substation and east of Davidson Avenue. These drainages do not support vegetation and are not considered jurisdictional waters of the U.S. by the Army Corps of Engineers or CDFG. The proposed PEC site is located approximately 2 miles southwest of Panoche Creek and approximately 2.7 miles west of the California Aqueduct. The nearest blue line stream, which originates in the Tumey Hills, is located approximately 1.8 miles southwest of the proposed project area.

Special-Status Species

Special-status species include those listed as threatened or endangered under the federal or California Endangered Species Acts, species proposed for listing, species of special concern, and other species which have been identified by the USFWS or CDFG as unique or rare. **Biological Resources Table 2** identifies the special-status species that were historically present or have the potential to be present within the vicinity of the proposed project area.

Special-status plant and wildlife species were not observed in or adjacent to the proposed project area during biological reconnaissance surveys conducted by the applicant on April 21, 2006 or subsequent staff site visits conducted on January 19 and February 28, 2007. Although not observed in the proposed project area, several special-status wildlife species are known to utilize agricultural areas in the region and thus have suitable habitat near the proposed PEC site. These species include but are not limited to Swainson's hawk (*Buteo swainsoni*), California horned lark (*Eremophila alpestris actia*), San Joaquin kit fox (*Vulpes macrotis mutica*), burrowing owl (*Athene cunicularia*), and short-eared owl (*Asio flammeus*). These species are indicated with an asterisk in **Biological Resources Table 2**.

Special-status plant species are not expected to occur in the proposed project area. The California Natural Diversity Database (CNDDB) and California Native Plant Society

(CNPS) literature search identified 12 plant species that are known to occur within the vicinity of the proposed project. However, there are no recorded occurrences of special-status plant species within one mile of the proposed project area. These species were determined to have little or no potential to occur on site due to the high-level of disturbance from ongoing agricultural activities and the resulting lack of suitable environmental conditions to support these species.

BIOLOGICAL RESOURCES Table 2
Special-Status Species Historically or Potentially Occurring in the Vicinity of the Proposed PEC Site

Scientific name	Common name	Status	Habitat Type	Potential To Occur
Plants				
Atriplex vallicola	Lost Hills crownscale	CNPS List 1B	Chenopod scrub, valley and foothill grasslands, vernal pools; elevation 50-635 m	low
Cordylanthus mollis ssp. hispidus	Hispid bird's-beak	CNPS List 1B	Meadows and seeps, playas, valley and foothill grasslands (alkaline); elevation 1-155 m	low
Deinandra halliana	Hall's tarplant	CNPS List 1B	Chenopod scrub, cismontane woodland, valley and foothill grassland (clay); elevation 300-950 m	low
Delphinium recurvatum	Recurved larkspur	CNPS List 1B	Chenopod scrub, cismontane woodland, valley and foothill grassland (alkaline); elevation 3-750 m	low
Eriogonum temblorense	Temblor buckwheat	CNPS List 1B	Valley and foothill grassland (clay or sandstone); elevation 300-1000 m	low
Erodium macrophyllum	Round-leaved filaree	CNPS List 1B	Cismontane woodland, valley and foothill grassland/clay; elevation 15-1200 m	low
Layia heterotricha	Pale-yellow layia	CNPS List 1B	Cismontane woodland, pinyon-juniper woodland, valley and foothill grassland (alkaline or clay); elevation 300-1705 m	low
Layia munzii	Munz's tidy-tips	CNPS List 1B	Chenopod scrub, valley and foothill grassland (alkaline or clay); elevation 150-700 m	low
Lepidium jaredii ssp. album	Panoche pepper-grass	CNPS List 1B	Valley and foothill grassland (alluvial fans, washes); elevation 185-275 m	low
Madia radiata	Showy madia	CNPS List 1B	Cismontane woodland, valley and foothill grassland; elevation 25-900 m	low
Monolopia congdonii	San Joaquin woollythreads	FE, CNPS List 1B	Chenopod scrub, valley and foothill grassland (sandy); elevation 60-800 m	low
Sagittaria sanfordii	Sanford's arrowhead	CNPS List 1B	Marshes and swamps; elevation 0-610 m	low
Insects and Crustacea				
Branchinecta lynchi	Vernal pool fairy shrimp	FT	Vernal pools	low
Coelus gracilis	San Joaquin dune beetle	FC	Vegetated sand dunes	low
Desmocerus californicus dimorphus	Valley elderberry longhorn beetle	FE	Elderberry shrubs in riparian and oak savannah habitats	low
Reptiles and Amphibians				
Ambystoma californiensa	California tiger salamander, central population	FT	Small ponds, lakes or vernal polls	low

Scientific name	Common name	Status	Habitat Type	Potential To Occur
Anniella pulchura pulchura	Silvery legless lizard	CSC	Beaches, sandy washes, woodland, chaparral and riparian areas; requires loose soil for burrowing or thick duff or leaf litter;	low
Emys (=Clemmys) marmorata	Western pond turtle	CSC	Woodlands, grasslands and open forests; occupies aquatic habitats	low
Gambelia sila	Blunt-nosed leopard lizard	FE, CE	Open habitats with scatted low bushes on alkali flats, low foothills, plains, washes, arroyos	low
Masticophis flagellum ruddocki	San Joaquin whipsnake	CSC	Open, dry grassland and saltbush scrub habitats with little to no tree cover	low
Phrynosoma coronatum frontale	California horned lizard	CSC	Grasslands, brushlands, woodlands and open coniferous forests with sandy or loose soil; requires abundant ant colonies	low
Rana aurora draytonii	California red-legged frog	FT	Permanent and semi-permanent aquatic habitats; may aestivate in rodent burrows or cracks	low
Thamnophis gigas	Giant garter snake	FT, CT	Sloughs, canals and other small waterways; requires grassy banks and emergent vegetation for basking	low
Fish				
Hypomesus transpacificus	Delta smelt	FT	Brackish water within the Sacramento-San Joaquin estuary	low
Oncorhynchus mykiss	Central valley steelhead	FT	Streams, rivers, lakes in Sacramento River basin	low
Birds				
Agelaius tricolor	Tricolor blackbird	CSC	Nest in dense colonies in emergent marsh vegetation with water at or near the nesting colony; requires large foraging areas with insects	low
**Asio flammeus*	Short-eared owl	CSC	Freshwater and salt marshes, lowland meadows and irrigated alfalfa fields	moderate
**Athene cunicularia*	Burrowing owl	CSC	Open, dry grasslands, agricultural and range lands, and desert habitats often associated with burrowing animals, such as ground squirrels	moderate
**Buteo swainsoni*	Swainson's hawk	CT	Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, grain fields	moderate
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	FC, CE	Wide, dense riparian forests	low
Falco mexicanus	Prairie falcon	CSC	Nests in cliffs or escarpments; forages in adjacent dry, open terrain or uplands, marshes and seasonal marshes	low
Haliaeetus leucocephalus	Bald eagle	FT, CE	Nests and roosts in coniferous forests within 1 mile of water	low
**Eremophila alpestris actia*	California horned lark	CSC	Open habitats with trees and large shrubs, ground nesters	moderate
Riparia riparia	Bank swallow	CT	Nests in bluffs or banks, usually adjacent to water	low
Mammals				
Ammospermophilus nelsoni	San Joaquin antelope squirrel	CT	Arid grasslands with loamy soils and moderate shrub cover	low
Antrozous pallidus	Pallid bat	CSC	Roosts in rocky outcrops, cliffs and crevices; forages in open habitat	low
Eumops perotis californicus	Western mastiff bat	CSC	Roosts and breeds in rock crevices, may also use trees, buildings, tunnels; forages in arid to semi-arid habitats	low
Dipodomys ingens	Giant kangaroo rat	FE, CE	Restricted to flat, sparsely vegetated areas with annual grassland or shrubland habitats; requires uncultivated soils for burrowing	low

Scientific name	Common name	Status	Habitat Type	Potential To Occur
Dipodomys nitratoides exilis	Fresno kangaroo rat	FE	Alkali sink habitats; elevation 60-90 m	low
Onychomys torridus tularensis	Tulare grasshopper mouse	CSC	Grasslands, chaparral, sagebrush and bitterbrush scrub, alkali desert scrub	low
Taxidea taxus	American badger	CSC	Open areas with scattered shrubs and trees for cover, loose soil for digging	low
**Vulpes macrotis mutica*	San Joaquin kit fox	FE, CT	Native grasslands and scrublands, agriculture matrix of row crops, irrigated and non-irrigated pasture, orchards, vineyards	high

Source: (PEC 2006a, CDFG 2007, USFWS 2007, CNPS 2007)

Status Key

State Status
CE = State listed as Endangered
CT = State listed as Threatened
CSC = California Species of Concern

California Native Plant Society (CNPS) Status
CNPS List 1B = Plants rare, threatened, or endangered in California, but more common elsewhere

Federal Status
FE = Federally listed as Endangered
FT = Federally listed as Threatened
FC = Candidate for Federal listing

Potential to Occur
High = Suitable habitat is present within the proposed site; occurrence records exist for species in proximity to the site; species expected to occur on site
Moderate = Low-quality suitable habitat is present within or near the proposed site; species was not identified during reconnaissance surveys of the site; species not expected to occur
Low = Suitable habitat is not present on site; species not expected to occur

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

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

- Have an adverse impact, either directly through take, or indirectly through habitat modification or interruption of migration corridors, on any state- or federally-listed species;
- Have an indirect or direct adverse effect on any sensitive natural community identified in federal, state or local plans, policies, or regulations;
- Interfere with the movement of any native wildlife species (resident or migratory) or with established native wildlife (resident or migratory) corridors; or
- Conflict with applicable federal, state, or local laws, ordinances, regulations and standards protecting biological resources, as listed in **Biological Resources Table 1**.

DIRECT/INDIRECT IMPACTS AND MITIGATION

According to California Environmental Quality Act (CEQA) Guidelines, direct impacts are a result of construction or operation of the project and occur at the same time and place as project activities. Indirect impacts are caused by the project, but can occur later in time or farther removed in distance from the project site, but are reasonably foreseeable and project-related. This section analyzes the potential for direct and indirect impacts of construction and operation of the proposed project to biological resources and provides mitigation, as necessary, in an effort to reduce the severity of potentially adverse impacts.

Applicant-proposed avoidance and minimization measures have been incorporated into the project description and considered part of the proposed project in an effort to reduce impacts to biological resources. These measures are separate from the Conditions of Certification, which are proposed in addition to the project description for the purpose of mitigating significant impacts. Following is a list of applicant-proposed impact avoidance and minimization measures (PEC 2006a, page 5.6-13):

- No tree removal during the bird breeding season (February 1 to August 31);
- Any existing raptor nests near the project area should be removed during the non-breeding season to minimize potential for nesting in the same location the following year;
- Pre-construction survey shall be conducted for any nesting raptor species;
- In order to minimize trapping of common wildlife, set up fences around construction zones and relocate any trapped wildlife. Fenced areas and trenches should be checked regularly by a biological monitor to rescue and relocate any trapped animals;
- Provide biological orientation training for workers onsite to educate them on procedures for minimizing impacts to common wildlife species and any rare occurrences of special-status species that have a low potential to occur in the project area; and
- An approved, designated biologist shall implement the above measures.

Construction Impacts and Mitigation

The proposed project consists of various components related to the generation and transmission of electricity, including:

- **Power Plant Site.** The proposed PEC site would permanently occupy 12.8 acres within a 128-acre parcel currently used as an active pomegranate orchard. The proposed PEC is a simple-cycle power generation project consisting of four General Electric LMS 100 natural gas fired combustion turbine generators (CTGs). Each of these CTGs is capable of generating 100 megawatts (MW) for a total net generation capacity of 400 MW. Process water will be supplied via two onsite supply wells connected to a deep brackish aquifer and wastewater would be disposed of via a deep well injection system. The deep well injection system would require a Class I non-hazardous Underground Injection Control (UIC) permit from the U.S. Environmental Protection Agency (EPA).

- **Access Road.** A new 50-foot paved road would be constructed to access the site from West Panoche Road. The access road would have two 12-foot wide lanes with 5-foot wide gravel shoulders on both sides and contoured drainage ditches.
- **Laydown and Parking Area.** The construction laydown area, which includes equipment staging and parking, would be located immediately south of the proposed power plant site. The 8-acre laydown area would be within the same 128-acre parcel as the PEC and is currently an active pomegranate orchard. The temporary laydown area would be restored to agricultural use once construction is complete.
- **Electric Interconnection.** Electricity generated from the PEC would be interconnected to the PG&E transmission grid through a 230-kV switchyard via a new 300-foot overhead 230-kV transmission line to the existing PG&E Panoche Substation. The 230-kV conductors would be supported by two 65-foot tall structures with 15-foot lightning masts attached to the structure peaks. The transmission line would extend from the northeast corner of the proposed PEC site northeast to the southwest corner of the existing Panoche Substation. In order to accommodate the termination of the 230-kV transmission line at the Panoche Substation, the existing 230-kV bus must be extended beyond the southern boundary of the substation property. The proposed expansion would require approximately 320 feet by 300 feet (96,000 square feet) of additional property to be acquired by PG&E.
- **Natural Gas Pipeline.** The proposed project includes a 2,400-foot natural gas supply pipeline that would be installed underground, north of Panoche Substation along Panoche Road. Pipeline installation would require a trench approximately 18 inches wide and 48 inches deep.
- **Reconductor.** In order to mitigate a potential Category “B” emergency overload resulting from operation of the PEC, reconductor of 1 mile of the existing Wilson-Gregg 230-kV transmission line would be required. It is not anticipated that temporary impacts associated with the reconductoring would have an adverse affect on biological resources; however, this component of the proposed project would require certification by the California Public Utilities Commission, and is not analyzed further in this document.

The proposed project would result in temporary disturbance and/or permanent loss of the existing pomegranate orchard. Temporary disturbance includes short-term impacts during construction of the power plant, substation expansion, pipeline installation, and construction of a new access road. Each of these activities would cause the removal of existing vegetation and disturbance of surface soils. In addition to substation expansion and PEC installation, permanent loss of the orchard would occur where new tower or pole foundations are installed for the electrical interconnection.

Construction Impacts to Vegetation

Construction impacts to vegetation may occur in a variety of ways, including the direct removal of plants during the course of construction. As these impacts are generally localized and are primarily temporary in nature, they are not usually considered significant unless the habitat type is regionally unique or is known to support sensitive species. These activities would result in the disturbance of approximately 20.8 acres of land (consisting of existing orchards); an estimated 8 acres would be temporarily

disturbed and approximately 12.8 acres would be permanently disturbed. However, as the proposed project site is located entirely within an active orchard and impacts to native vegetation would not occur, these impacts would be considered less than significant and no mitigation is proposed. Construction-related impacts to the temporary laydown area would be mitigated by restoring the site to agricultural use once construction is complete.

Construction Impacts to Wildlife

Direct loss of small mammals, reptiles, and other less mobile species could occur during project construction. This would result primarily from the use of construction vehicles and the grading of the project site and laydown areas. Fossorial species, such as small burrowing animals (lizards, snakes, and small mammals), may be harmed through the crushing of burrows, loss of refugia from predators, and direct mortality from construction activities. Construction activities and human presence can also alter or disrupt the breeding and foraging habitat for common wildlife species.

Wildlife may become entrapped in open trenches during construction of the PEC or installation of the natural gas pipeline. As an impact avoidance and minimization measure, the applicant would set up fences around construction zones to prevent the entrapment of wildlife. Fenced areas and trenches would be inspected prior to construction activities each day. Additionally, staff recommends implementation of Condition of Certification **BIO-10** (Mitigation Management to Avoid Harassment or Harm) which would also require the installation of escape ramps. Implementation of these measures is expected to mitigate adverse impacts to wildlife.

Birds may nest in the pomegranate trees, which are proposed for removal to construct the PEC. With the exception of a few species, nesting birds are protected under the Migratory Bird Treaty Act (MTBA) and are also offered protection by Fish and Game Code, section 3503. Impacts to nesting species would be considered significant without mitigation. To reduce impacts to breeding birds and ensure compliance with the MTBA, the applicant has proposed Avoidance and Minimization Measures that prohibit tree removal between February 1 and August 31. Also, per the applicant-proposed avoidance and minimization measures, pre-construction surveys would be conducted to identify raptor nests. Additionally, staff recommends, that the pre-construction survey include nests of birds protected under the MTBA and Fish and Game Code, section 3503 (see Condition of Certification **BIO-10** (Mitigation Management to Avoid Harassment or Harm)). Implementation of these measures is expected to mitigate adverse impacts to nesting birds that may occur in the project area.

Construction Impacts to Special-Status Species

Vegetation

Special-status plant species are not expected to occur in the proposed project area. As previously described, CNDDB and CNPS databases identified 12 plant species that are known to occur within the vicinity of the proposed project. However, there are no recorded occurrences of special-status plant species within one mile of the proposed project area and habitat suitability is generally poor within the proposed PEC site due to

ongoing agricultural operations. Therefore, significant adverse impacts to special-status plant species are not expected to occur from construction of the proposed project.

Wildlife

Several special-status wildlife species were identified that are known to utilize agricultural habitat and thus have potential to occur in the proposed project area. These species include the short-eared owl (*Asio flammeus*), burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), California horned lark (*Eremophila alpestris actia*), and San Joaquin kit fox (SJKF) (*Vulpes macrotis mutica*). Of these, only SJKF is expected to occur in the proposed project area. Due to a lack of open habitat, the short-eared owl, burrowing owl, Swainson's hawk, and California horned lark are not expected to occur.

Critical habitat is a formal designation under the Federal Endangered Species Act where specific areas are designated as essential to the conservation and recovery of a federally listed species. These areas may require special management consideration or protection. Critical habitat for special-status wildlife does not occur in the proposed project area (CDFG 2007).

Short-eared owl is a California Species of Concern that inhabits open fields, meadows, marshes, and prairies. The diet of this species generally consists of rodents, especially voles, other small mammals and insects. Short-eared owls may be diurnal, crepuscular or nocturnal; although hunting typically occurs at night. To catch prey, this species flies low over open fields, seizing prey with their talons (Elrich 1988). A CNDDB record documented in 1993 identified this species in non-native grassland approximately 5.75 miles southeast of the proposed project area (PEC 2006a). Due to a lack of suitable habitat, this species is not expected to occur in the proposed project area. Therefore, significant adverse impacts to short-eared owl are not expected to occur from construction of the proposed project.

Burrowing owl is a California Species of Concern that is a yearlong resident of open, dry grassland, prairie, or desert floor. Similar to the short-eared owl, this species is diurnal, crepuscular, and nocturnal and is thought to be semi-colonial. Burrowing owl is known to occur in urban areas, disturbed areas, and at the edges of agricultural fields and typically hunts from a perch or hops after prey on the ground. Due to intensive agricultural practices and lack of suitable burrow sites, nesting habitat for this species does not appear to occur in the proposed project area. Additionally, the orchard does not provide the hunting visibility required by this species. The nearest CNDDB record is approximately 5 miles southwest of the proposed project (PEC 2006a). Significant adverse impacts to burrowing owl are not expected to occur from construction of the proposed project.

Swainson's hawk is a California threatened species that requires large amounts of foraging habitat, preferably grassland or pasture habitats. Preferred prey items are voles, gophers, birds, and insects such as grasshoppers (Estep 1989). This species has adapted to the use of some croplands, including alfalfa, hay, grain, tomatoes, beets, and other row crops (Estep 1989). Crops such as cotton, corn, rice, orchards, and vineyards are not suitable due to a lack of suitable prey or the prey is unavailable to the Swainson's hawks due to crop structure. Swainson's hawks are known to occur in the

region, but prefer to forage in alfalfa fields or harvested row crops where the visibility and number of prey items is high. Regionally, these areas are the primary foraging area for locally nesting Swainson's hawks. The nearest CNDDB record for Swainson's hawk was documented in 2005, 5.25 miles north of the proposed project area along the eastern embankment of the California Aqueduct (PEC 2006a). Due to a lack of suitable foraging habitat, this species is not expected to occur in the proposed project area. Therefore, significant adverse impacts to Swainson's hawk are not expected to occur from construction of the proposed project.

California horned lark is a California Species of Concern that typically inhabits shortgrass prairies, agricultural fields, sparse brushlands, deserts and other open areas in California. This species may be locally common in grazed pastures, fallow fields and other agricultural areas. California horned lark nests consist of ground depressions and are vulnerable to destruction from agricultural equipment. Current agricultural practices at the proposed PEC site would not support nesting California horned lark. According to a 1992 CNDDB record, this species was observed approximately 9 miles southeast of the proposed project area in a fallow agricultural field (PEC 2006a). Due to a lack of suitable habitat, this species is not expected to occur in the proposed project area. Therefore, significant adverse impacts to California horned lark are not expected to occur from construction of the proposed project.

San Joaquin kit fox (SJKF), a California Threatened and federally Endangered species, utilizes **agricultural** land within the San Joaquin Valley. As illustrated in **Biological Resources Figure 1**, the proposed PEC site is within the eastern boundary of the northern core population, as designated by USFWS. Additionally, the proposed PEC site is located in an area that has been identified by USFWS to be preserved for SJKF habitat connectivity. The nearest CNDDB occurrence record is approximately 3 miles west and was documented in 1999. Because SJKF may travel more than 9 miles overnight during the breeding season (USFWS 1998) and there is contiguous non-irrigated agricultural habitat between the known core population and the proposed PEC site, SJKF may utilize the existing habitat within the proposed PEC site for foraging or as a migration corridor. USFWS categorizes suitable SJKF habitat according to level of quality in order to determine habitat compensation ratios: 1) natural, 2) grassland, and 3) agricultural/ruderal (Jones 2007). The agricultural/ruderal classification (lowest habitat quality classification) applies to the proposed PEC site. CDFG has determined that the proposed PEC site is not suitable for SJKF denning (PEC 2007a). However, there is the potential for individuals to be adversely impacted during project construction and operation as a result of habitat loss.

Loss of SJKF habitat would be considered significant without mitigation and requires consultation with the USFWS to develop mitigation measures and provisions for incidental take. USFWS has identified an ESA consultation process by which the applicant and USFWS enter into a Memorandum of Understanding thereby providing a federal nexus for the proposed project and triggering Section 7 consultation. The Section 7 process, including preparation of a Biological Assessment (BA) by the applicant and a Biological Opinion (BO) by USFWS, will specify actions that are required to avoid, minimize or compensate for any potentially adverse impacts to SJKF and their habitat. In order to provide a complete analysis of potential impacts to SJKF resulting from the proposed project, a USFWS-approved BA must be completed and

submitted prior to publication of the Final Staff Assessment. Habitat compensation will also be required and USFWS has identified the Krayenhagen Hills Conservation Bank as a preferred location to purchase mitigation credits at 1.1:1 acres for permanent disturbance and 0.3:1 for temporary disturbance (Jones 2007). USFWS may require additional protective measures pursuant to the Federal ESA consultation process.

Implementation of the following Conditions of Certification will further avoid and mitigate potentially adverse impacts to SJKF to less than significant levels: **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (Worker Environmental Awareness Program), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-8** (Federal Biological Opinion), **BIO-9** (Impact Avoidance and Minimization Features), **BIO-10** (Mitigation Management of Avoid Harassment or Harm), and **BIO-11** (Habitat Compensation). Condition of Certification **BIO-9** contains the general measures from UFSWS Standardized Recommendations for Protection of SJKF Prior to or During Ground Disturbance (1999).

General Construction Impacts

Construction activities have the potential to create a variety of temporary impacts to biological resources including:

- **Noise** (for a complete discussion of noise impacts, see the **Noise** section of this Staff Assessment). Construction activities would result in a short-term temporary increase in the ambient noise level. Such activities have the potential to disrupt the nesting, roosting, or foraging activities of local wildlife. However, the existing Wellhead and CalPeak Panoche Peaker Plants, PG&E Substation, traffic on West Panoche Road, and intensive agricultural operations in the immediate vicinity of the proposed PEC site create an elevated ambient noise level to which local wildlife species (including SJKF) have acclimated. As such, construction noise is not expected to adversely impact sensitive biological resources.
- **Lighting** (for a complete discussion of visual resource impacts, see the **Visual Resources** section of this Staff Assessment). Since night construction would not occur (PEC 2006a, page 5.12-9), excess lighting would not significantly impact wildlife in the vicinity of the proposed PEC site. The applicant would direct lighting to avoid excessive glare and backscatter. Additionally, existing energy facilities provide an elevated ambient level of lighting to which local wildlife, including nocturnal species, have acclimated.

Operation Impacts and Mitigation

Potential impacts resulting from operation of the PEC include avian collision with and/or electrocution by the electric interconnection facilities and disturbance to wildlife due to increased noise and lighting.

Avian Collision and Electrocution

The proposed project includes four 90-foot turbine stacks, a 60-foot cooling tower, and two 80-foot transmission support structures (consisting of a 65-foor tower with 15-foot lightning mast). The proposed transmission support structures are two H- or A-frame dead end take off structures with a 300-foot transmission span.

Bird collisions with power lines and transmission structures generally occur when a power line or other structure transects a daily flight path used by a concentration of birds and migrating birds are traveling at reduced altitudes and encounter tall structures in their path (Brown 1993). Collision rates generally increase in low light conditions, during inclement weather, during strong winds, and during panic flushes when birds are startled by a disturbance or are fleeing from danger. Collisions are more probable near wetlands, within valleys that are bisected by power lines, and within narrow passes where power lines run perpendicular to flight paths (APLIC 1996); these features are not present in the vicinity of the proposed project area. Therefore, staff concludes that the PEC transmission structures would not pose a significant collision threat to resident or migratory bird populations.

Red-tailed hawk and other large aerial perching birds, including those offered state and/or federal protection, are susceptible to transmission line electrocution. Because raptors and other large birds often perch on tall structures that offer optimal views of potential prey, the design characteristics of transmission towers/poles are a major factor in raptor electrocutions (APLIC 1996). Electrocution occurs only when a bird simultaneously contacts two energized phase conductors or an energized conductor and grounded hardware. This happens most frequently when a bird attempts to perch on a transmission tower/pole with insufficient clearance between these elements. Raptor species that utilize the towers for nesting could be electrocuted while landing. Furthermore, nests may be built in areas that are susceptible to electrical charges that may result in fire as well as an electrical outage. However, the majority of raptor electrocutions are caused by lines that are energized at voltage levels between 1-kV and 60-kV, and "the likelihood of electrocutions occurring at voltages greater than 60-kV is low" because phase-to-phase and phase-to-ground clearances for lines greater than 60-kV are typically sufficient to prevent bird electrocution (APLIC 2006). The proposed PEC transmission lines would be 230 kV; therefore, phase-to-phase and phase-to-ground clearances are expected to be sufficient to minimize bird electrocutions. However, the following measure is proposed to ensure adequate spacing of phase conductors.

Potential impacts to wildlife resulting from electrocution by transmission lines may be mitigated by incorporating the construction design recommendations provided in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (see Condition of Certification **BIO-9**). Specifically, the phase conductors shall be separated by a minimum of 150 cm (60 in). In addition to the aforementioned separation requirements, Condition of Certification **BIO-9** states that bird perch diverters and/or specifically designed avian protection materials should be used to cover electrical equipment where adequate separation is not feasible (APLIC 2006). With implementation of this mitigation, significant avian mortality due to electrocution by PEC transmission structures is not expected to occur.

Noise

Wildlife species in the vicinity of the proposed PEC are accustomed to elevated ambient noise levels as a result of the existing Wellhead and CalPeak Panoche Peaker Plants, PG&E Panoche Substation, traffic on West Panoche Road, and intensive agricultural

operations. Although operation of the PEC would create additional noise, significant impacts to biological resources are not expected.

Light

Existing energy facilities adjacent to the proposed PEC site provide an elevated ambient level of lighting to which local wildlife, including nocturnal species, have acclimated. Although operation of the PEC would create additional light, significant impacts to biological resources are not expected.

Hazardous Materials

An accidental release of hazardous materials such as aqueous ammonia has the potential to negatively impact sensitive biological species if these species are found on the proposed project site or nearby. The probability of a hazardous materials spill occurring at PEC is extremely low. Staff has determined that appropriate procedures will be in place to address any disposal and/or treatment of hazardous materials on the proposed project site – more information about these standard procedures are addressed in the **Hazardous Materials** and **Waste Management** sections of this staff assessment. Due to the lack of sensitive biological resources on site or in the project vicinity and the extremely low probability of a catastrophic hazardous materials spill, staff concludes there will be no significant impact to biological resources associated with hazardous materials.

CUMULATIVE IMPACTS AND MITIGATION

Cumulative impacts are those that result from the incremental impacts of an action considered with other past, present, and reasonable foreseeable future actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over time.

The PEC would permanently remove approximately 12.8 acres and temporarily disturb 8 acres of SJKF habitat, requiring consultation with USFWS. In addition to the PEC, there are projects proposed in western Fresno County that require consultation with USFWS regarding impacts to SJKF, including habitat compensation:

- Starwood Power-Midway, LLC has submitted an application to the Energy Commission (06-AFC-10) for the Starwood Power-Midway Peaking Project, which is an 120 MW peaking facility located approximately 0.25 miles east of the proposed PEC site.
- The U.S. Department of Justice, Federal Bureau of Prisons is expected to complete construction of a medium-security Federal Correctional Institution requiring approximately 960 acres of primarily agricultural land (orange orchards) near the City of Mendota, approximately 10 miles east of the proposed PEC site. The federal Biological Opinion was finalized in March 2004 (CEC 2007).

Construction and operation of these projects would adversely affect SJKF, due to habitat destruction and fragmentation. However, consultation with USFWS including habitat compensation at a USFWS-approved mitigation bank is intended to address long-term impacts to this species and compliance with the requirements of Section 7 of the federal Endangered Species Act will mitigate cumulative impacts to SJKF.

COMPLIANCE WITH LORS

To comply with applicable LORS, specifically the federal Endangered Species Act, the applicant would need to obtain a USFWS determination under ESA Section 7, as undertaken by USFWS. The USFWS Biological Opinion (BO) may identify additional mitigation requirements in addition to the Conditions of Certification presented in this document. The Energy Commission's certifying power supersedes that of any State of local regulatory agency (i.e., CDFG) per the Warren Alquist Act (section 25500), therefore a CDFG section 2080.1 Consistency Determination is not required by the Energy Commission. Staff has recommended mitigation measures and Conditions of Certification which, when considered together with the Biological Assessment (BA) and federal BO, will meet the requirements of the California Endangered Species Act that any impacts to listed species be minimized and fully mitigated.

USFWS has identified an ESA consultation process by which the applicant and USFWS enter into a Memorandum-of-Understanding thereby providing a federal nexus for the proposed project and triggering Section 7 consultation. To obtain a USFWS determination, the Applicant will prepare a BA for submittal to USFWS. After reviewing the BA, USFWS may issue a BO within 135 days.

NOTEWORTHY PUBLIC BENEFITS

Construction and operation of the PEC would not result in any noteworthy public benefits with regard to biological resources.

CONCLUSIONS

Without mitigation, the proposed PEC project would result in significant adverse impacts to biological resources. The proposed PEC is within the eastern boundary of the northern core SJKF population, thereby requiring federal Endangered Species Act consultation with USFWS. The Conditions of Certification proposed in this Preliminary Staff Assessment, including measures provided in the USFWS Biological Opinion, are necessary to mitigate impacts to biological resources from the proposed PEC to less than significant levels.

In coordination with the U.S. EPA, the applicant will prepare a BA for the USFWS to review in preparation of a BO. Staff requires a USFWS-approved BA to fully analyze potential impacts to SJKF resulting from the proposed PEC project and to complete the Final Staff Assessment.

PROPOSED CONDITIONS OF CERTIFICATION

Designated Biologist Selection

BIO-1 The project owner shall assign a Designated Biologist to the project. The project owner shall submit the resume of the proposed Designated Biologist, with at least 3 references and contact information, to the Energy Commission Compliance Project Manager (CPM) for approval.

The Designated Biologist must at least meet the following minimum qualifications:

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

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

Verification: The project owner shall submit the specified information at least 90 days prior to the start of any site (or related facilities) mobilization. No site or related facility activities shall commence until an approved Designated Biologist is available to be on site.

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM at least ten working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the project owner shall immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.

Designated Biologist Duties

BIO-2 The project owner shall ensure that the Designated Biologist performs the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities. The Designated Biologist may be assisted by the approved Biological Monitor(s), but remains the contact for the project owner and CPM.

1. Advise the project owner's Construction and Operation Managers on the implementation of the biological resources Conditions of Certification;
2. Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan, to be submitted by the project owner;
3. Be available to supervise, conduct and coordinate mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special status species or their habitat;
4. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;

5. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (i.e. parking lots) for animals in harm's way;

6. Notify the project owner and the CPM of any non-compliance with any biological resources Condition of Certification;

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

8. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the Monthly Compliance Report and the Annual Report; and

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

Verification: The Designated Biologist shall submit in the Monthly Compliance Report to the CPM copies of all written reports and summaries that document biological resources activities. If actions may affect biological resources during operation a Designated Biologist shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report unless their duties are ceased as approved by the CPM.

Biological Monitor Qualifications

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

Biological Monitor(s) training by the Designated Biologist shall include familiarity with the Conditions of Certification and the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), WEAP and all permits.

Verification: The project owner shall submit the specified information to the CPM for approval at least 30 days prior to the start of any site (or related facilities) mobilization. The Designated Biologist shall submit a written statement to the CPM confirming that individual Biological Monitor(s) have been trained including the date when training was completed. If additional Biological Monitors are needed during construction, the specified information shall be submitted to the CPM for approval 10 days prior to their first day of monitoring activities.

Designated Biologist and Biological Monitor Authority

BIO-4 The project owner's Construction/Operation Manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources Conditions of Certification.

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

The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued;

2. Inform the project owner and the Construction/Operation Manager when to resume activities; and

3. Notify the CPM if there is a halt of any activities, and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the work stoppage.

If the Designated Biologist is unavailable for direct consultation, the Biological Monitor shall act on behalf of the Designated Biologist.

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

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

Worker Environmental Awareness Program

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

The WEAP must:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material and electronic media is made available to all participants;

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

3. Present the reasons for protecting these resources;

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

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

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

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

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

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

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

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

Biological Resources Mitigation Implementation and Monitoring Plan

BIO-6 The project owner shall submit two copies of the proposed Biological Resources Mitigation Implementation and monitoring Plan (BRMIMP) to the CPM (for review and approval) and to USFWS (for review and comment) and shall implement the measures identified in the approved BRMIMP.

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

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

2. All biological resources Conditions of Certification identified as necessary to avoid or mitigate impacts;

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

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

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

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

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

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

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

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

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

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

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

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

15. Restoration and revegetation plan;

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

17. A copy of all biological resources related permits obtained.

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

The CPM, in consultation with the USFWS and any other appropriate agencies, will determine the BRMIMP's acceptability within 45 days of receipt. If there are any permits that have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to the CPM and the USFWS within five (5) days of their receipt and the BRMIMP shall be revised or supplemented to reflect the permit condition within 10 days of their receipt by the project owner. Ten days prior to site and related facilities mobilization the revised BRMIMP shall be resubmitted to the CPM.

The project owner shall notify the CPM no less than five working days before implementing any modifications to the approved BRMIMP to obtain CPM approval. Any changes to the approved BRMIMP must also be approved by the CPM and the USFWS to ensure no conflicts exist.

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

Closure Plan Measures

BIO-7 The project owner shall incorporate into the permanent or unexpected permanent closure plan and the BRMIMP, measures that address the local biological resources.

The planned permanent or unexpected permanent closure plan shall address the following biological resources 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 related facilities;

3. Measures to restore wildlife habitat to promote the re-establishment of native plant and wildlife species; and

4. Revegetation of the plant site and other disturbed areas utilizing appropriate seed mixture.

Verification: Draft permanent or unexpected closure measures shall be made part of the BRMIMP. At least 12 months prior to commencement of closure activities, the

project owner shall address all biological resources related issues associated with facility closure, and provide final measures, in a Biological Resources Element. The Biological Resources Element shall be incorporated into the Facility Closure Plan and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

Federal Biological Opinion

BIO-8 The project owner shall provide a copy of the final Biological Opinion per Section 7 of the federal Endangered Species Act obtained from the U. S. Fish and Wildlife Service. The terms and conditions contained in the Biological Opinion shall be incorporated into the project's BRMIMP.

Verification: At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit to the CPM a copy of the U. S. Fish and Wildlife Service's Biological Opinion.

Impact Avoidance Mitigation Features

BIO-9 Any time the project owner modifies or finalizes the project design they shall incorporate all feasible measures that avoid or minimize impacts to the local biological resources, including:

1. Design, install and maintain transmission line poles, access roads, pulling sites, and storage and parking areas to avoid identified sensitive resources;

2. Design, install and maintain transmission lines and all electrical components in accordance with the APLIC *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* to reduce the likelihood of electrocutions of large birds;

3. Eliminate any California Exotic Pest Plants of Concern (CalEPPC) List A species from landscaping plans;

4. Prescribe a road sealant that is non-toxic to wildlife and plants; and

5. Design, install, and maintain facility lighting to prevent side casting of light towards wildlife habitat;

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP. Implementation of the measures will be reported in the Monthly Compliance Reports by the Designated Biologist. Within thirty (30) days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how measures have been completed.

Mitigation Management to Avoid Harassment or Harm

BIO-10 The project owner shall implement the following measures to manage their construction site, and related facilities, in a manner to avoid or minimize impacts to the local biological resources. Some of the following measures

were adopted from USFWS "Standardized Recommendations for Protection of SJKF Prior to or During Ground Disturbance" (1999).

1. Install temporary fencing and provide wildlife escape ramps for construction areas that contain steep walled holes or trenches if outside of an approved, permanent exclusionary fence. The temporary fence shall be hardware cloth or similar materials that are approved by USFWS. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals by the Designated Biologist or Biological Monitor;

2. Make certain all food-related trash is disposed of in closed containers and removed at least once a week from the project site;

3. Prohibit feeding of wildlife by staff and subcontractors;

4. Prohibit non-security related firearms or weapons from being brought to the site;

5. Prohibit pets from being brought to the site;

6. Report all inadvertent deaths of sensitive species to the appropriate project representative. Injured animals shall be reported to CDFG and the project owner shall follow instructions that are provided by CDFG. The Sacramento USFWS Office shall be notified in writing within three working days of the accidental death or injury to a SJKF during project related activities. Contact USFWS and CDFG for specific notification procedures;

7. Minimize use of rodenticides and herbicides in the project area and prohibit the use of chemicals and pesticides known to cause harm to amphibians. If rodent control must be conducted, zinc phosphide shall be used;

8. Project-related vehicles shall observe a 20-mph speed limit in all project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. Off-road traffic outside of designated project areas is prohibited.

9. Project owner shall conduct pre-construction surveys for nesting birds if construction and removal activities are scheduled to occur during the breeding season for raptors and other migratory birds. Surveys shall be conducted in areas within 500 feet of tower sites, laydown/staging areas, power plant sites, and access road/spur road locations. Project owner shall be responsible for designating a qualified biologist who can conduct pre-construction surveys and monitoring for nests and breeding birds. If nests or breeding birds are found during the survey, a disturbance-free buffer shall be established in coordination with CDFG.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP. Implementation of the measures will be reported in the Monthly Compliance Reports by the Designated Biologist. Within thirty (30) days after

completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how measures have been completed.

Habitat Compensation

BIO-11 The project owner shall provide habitat compensation for temporary and permanent impacts to San Joaquin Kit Fox at a location and amount approved by USFWS.

Verification: No less than 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit written verification to the CPM and USFWS that the transaction for habitat compensation has occurred.

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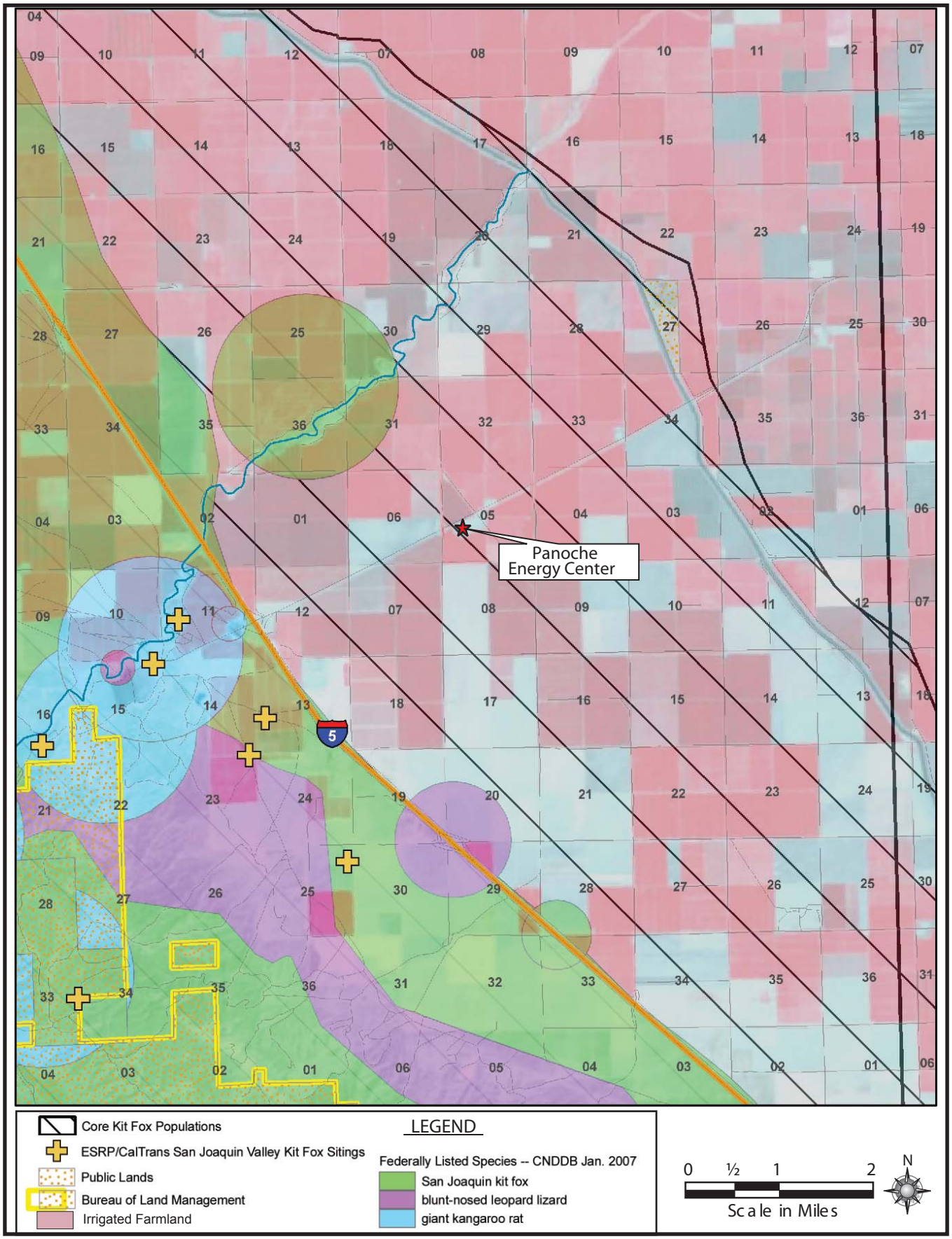
BIOLOGICAL RESOURCES - FIGURE 1

Panoche Energy Center - Sensitive Species in the Vicinity of Project



CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Aspen Environmental Group

CULTURAL RESOURCES

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SUMMARY OF CONCLUSIONS

Staff has determined that the Panoche Energy Center (PEC) would have no impact on known significant archaeological resources, historic structures, or ethnographic resources. With the adoption and implementation of the proposed Conditions of Certification, **CUL-1** through **CUL-7**, the PEC would have no impact on potentially significant archaeological resources which may be discovered during construction.

INTRODUCTION

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

Prehistoric archaeological resources are those materials relating to prehistoric human occupation and use of an area. These resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of Native American human behavior. In the Central Valley of California, the prehistoric period began over 11,500 years ago and extended through the eighteenth century until 1769, the time when the first Spaniards settled in Alta California.

Historic-period resources are those materials, archaeological and architectural, usually associated with Euro-American exploration and settlement of an area and the beginning of a written historical record. They may include archaeological deposits, sites, structures, traveled ways, artifacts, or other evidence of human activity. Under federal and state requirements, historical cultural resources must be greater than 50 years old to be considered of potential historical importance. A resource less than 50 years of age may be historically important if the resource is of exceptional significance.

Ethnographic resources are those materials important to the heritage of a particular ethnic or cultural group, such as African Americans, Mexican Americans, Native Americans, or European, Asian, or Latino immigrants and their descendants. They may include traditional resource collecting areas, ceremonial sites, topographic features, cemeteries, shrines, or ethnic neighborhoods and structures.

For the PEC, staff provides an overview of the environmental setting and history of the project area, an inventory of the cultural resources identified in the project vicinity, a consideration of the significance of those cultural resources, and an analysis of the effects of possible project impacts on those cultural resources, using significance criteria from the California Environmental Quality Act (CEQA). Where significant impacts to significant cultural resources, both known and not yet discovered, cannot be avoided, measures to mitigate the adverse effects on or loss of the resources are proposed. The primary concerns are to ensure that all potential impacts to significant cultural resources

are identified and that conditions are imposed on the project that would ensure that any significant impacts are reduced to a less than significant level.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Projects licensed by the Energy Commission are reviewed to ensure compliance with all applicable laws. For this project, in which there is no federal involvement,[1] the applicable laws are primarily state laws, in particular, CEQA. Although the Energy Commission has pre-emptive authority over local laws, it typically ensures compliance with local laws, ordinances, regulations, standards, plans, and policies.

CULTURAL RESOURCES Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
State	
Public Resources Code, section 21083.2	The lead agency may require reasonable steps to preserve a unique archaeological resource in place. Otherwise, the project applicant is required to fund mitigation measures to the extent prescribed in this section. This section also allows a lead agency to make provisions for archaeological resources unexpectedly encountered during construction, which may require the project applicant to fund mitigation and delay construction in the area of the find (CEQA).
California Code of Regulations, Title 14, section 15064.5, subsections (d), (e), and (f)	Subsection (d) allows the project applicant to develop an agreement with Native Americans on a plan for the disposition of remains from known Native American burials impacted by the project. Subsection (e) requires the landowner (or authorized representative) to rebury Native American remains elsewhere on the property if other disposition cannot be negotiated within 24 hours of accidental discovery and required construction stoppage. Subsection (f) directs the lead agency to make provisions for historical or unique archaeological resources that are accidentally discovered during construction, which may require the project applicant to fund mitigation and delay construction in the area of the find (CEQA Guidelines).

[1] Cultural resources are indirectly protected under provisions of the federal Antiquities Act of 1906 (Title 16, United States Code, Section 431 et seq.) and subsequent related legislation, policies, and enacting responsibilities, e.g., federal agency regulations and guidelines for implementation of the Antiquities Act.

California Code of Regulations, Title 14, section 15126.4(b)	This section describes options for the lead agency and for the project applicant to arrive at appropriate, reasonable, enforceable mitigation measures for minimizing significant adverse impacts from a project. It prescribes the manner of maintenance, repair, stabilization, restoration, conservation, or reconstruction as mitigation of a project's impact on a historical resource; discusses documentation as a mitigation measure; and advises mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery through excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan (CEQA Guidelines).
Public Resources Code 5024.1	The California Register of Historical Resources (CRHR) is established and includes properties determined eligible for the National Register of Historic Places (NRHP)(criteria: A. events, B. important persons, C. distinctive construction, and D. data); State Historic Landmark No. 770 and subsequent numbered landmarks; points of historical interest recommended for listing by the State Historical Resources Commission; and historical resources, historic districts, and landmarks designated or listed by a city or county under a local ordinance. CRHR criteria are 1) events, 2) important persons, 3) distinctive construction, and 4) data.
Public Resources Code 5020.1 (h)	"Historic district" means a definable unified geographic entity that possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development.
California Health and Safety Code, Section 7050.5	This code makes it a misdemeanor to disturb or remove human remains found outside a cemetery. This code also requires a project owner to halt construction if human remains are discovered and to contact the county coroner.
Local	
Fresno County General Plan (2000) Policy OS-J.1	The County shall require discretionary development projects to identify and protect important historical, archaeological, paleontological, and cultural sites and their contributing environment, as part of any required CEQA review.
Fresno County General Plan (2000) Policy OS-J.2	The County shall hold the locations of archaeological sites confidential.
Fresno County General Plan (2000) Policy OS-J.3	The County shall solicit the views of the local Native American community regarding development projects affecting sites of concern to Native Americans.
Fresno County General Plan (2000) Policy OS-J.4	The County shall maintain an inventory (Index of Historical Properties in Fresno County) of sites and structures determined to be of historical significance.

SETTING

REGIONAL SETTING

The project area is located in the western San Joaquin Valley, in the Central Valley Physiographic Province of California, at an elevation of about 420 feet above mean sea level. The local terrain is nearly flat, with a very gradual upslope to the northeast toward Panoche Creek, the source of the alluvial fan on which the proposed site is located.

The area is in predominately irrigated agricultural use, but in the immediate vicinity of the proposed plant site, there are a PG&E substation (the Panoche Substation), and two existing power plants (the Wellhead and the CalPeak plants), with another power plant (Starwood-Midway Power) currently under review for California Energy Commission (CEC) certification (PEC 2006a: p. 5.3-1; p. 1-2).

PROJECT, SITE, AND VICINITY DESCRIPTION

The proposed project site is located south of West Panoche Road in Fresno County, approximately two miles east of Interstate Highway 5 and 50 miles west of the City of Fresno. The approximately 128-acre parcel, on part of which the applicant proposes to build the PEC, is currently a pomegranate field. The Panoche Substation is located at the northeast corner of the proposed plant site, and the existing CalPeak Plant is on the east side of the substation. The proposed Starwood-Midway plant would be constructed on a parcel just east of the substation, and the existing Wellhead plant is located just south of the proposed Starwood-Midway parcel. There are three groupings of residential/agricultural buildings in the immediate area: a group of three small residences across West Panoche Road from the proposed PEC plant, a residential "five-plex" located between the proposed Starwood-Midway plant and West Panoche Road, and a grouping of agricultural buildings on the north side of West Panoche Road, about .5 mile east of the proposed PEC plant. Three 230-kV transmission lines and a natural gas pipeline run approximately southeast-to-northwest, the transmission lines running between the proposed plant site and the substation, and the gas pipeline running just west of the agricultural complex. The substation, power plants, and existing linear facilities comprise a small light industrial cluster in what is otherwise a great unbroken expanse of agriculture (PEC 2006a: pp. 3.1 to 3.2; Fig. 5.7-1).

The proposed plant would have a nominal output of 400 megawatts (MW). The plant equipment would consist of four natural-gas-fired combustion turbine-generators, with a mechanical-draft evaporative cooling tower and circulating water pumps, natural-gas compressors, generator step-up and auxiliary transformers, a demineralizing water treatment system, and water- and wastewater-storage tanks (PEC 2006a: p. 3-4; Fig. 3.5-1).

Construction, as presently planned, would be at about one to three feet above existing grade, with imported fill used to establish finish grade (PEC 2006a: p 3-33). The geotechnical study of the plant site recommends that the surface soils either be stripped and replaced to a maximum of ten feet, if mat foundations are to be used, or that driven pile foundations be used without soil improvement. The excavations for foundations and for the underground piping could, therefore, be dug down through native soils or through as much as 13 feet of fill soils, depending on which part of the site is being excavated

and/or what kinds of foundations are ultimately chosen. With these variables possibly remaining unresolved until construction ensues, staff must assume that project excavations could extend into undisturbed, native soils (PEC 2006a, Appendix L: pp. 9-10, 14). Additionally, fill soils to raise the proposed plant site grade would be obtained from a commercial site, but removed site soils would be disposed of "as topsoil in yet-to-be-determined nearby agricultural settings" (PEC 2007a: Data Response 28 Rev).

The proposed 16-inch-diameter, 2,400-foot-long underground natural gas pipeline would run north from a new metering station on the east side of the proposed plant site and exit the plant site at the northeast corner. It would then run northwest parallel to the 230-kV line, turn east and run along the south side of West Panoche Road to tap into a PG&E trunk line about 1,100 feet away. An alternate route would follow much the same course, except that it would run along the north side of West Panoche Road. The construction would be open-trench, with excavations to four feet in depth and 18 inches in width (PEC 2006a: p. 3-40; PEC 2007a: Data Response 29 Rev).

The proposed 230-kV overhead interconnection line route would run about 300 feet in length, from the northeast corner of the proposed plant site to the tie-in at the Panoche Substation. To accommodate this interconnection at the substation, the existing 230-kV bus would have to be extended. This expansion would entail the acquisition by PG&E of a parcel of land, measuring 320 feet (north-south) X 150 feet (east-west), to the south of the existing 230-kV bus. The proposed project would require bus modifications, expansion of the main ground grid, and new lighting and fencing at the Panoche Substation. Two dead-end take-off structures would be required to support the interconnection line, one at the new outdoor switchyard of the proposed facility and one at the substation (PEC 2006a: pp. 3-34 to 3-37).

Transmitting the output from the proposed PEC to the state's electrical grid would require the reconductoring of one mile of the Wilson-Gregg 230-kV transmission line on the north side of the San Joaquin River in Madera County, just north of the town of Herndon. Concomitantly, the terminal equipment of the Gregg Substation would have to be upgraded to accommodate the new ampacity rating of the new conductors on the Wilson-Gregg transmission line (PEC 2006g; PEC 2007d: p. CR-3).

The proposed plant would use water from two wells which would be drilled on-site to tap "a lower aquifer." This water would be used for all needs at the proposed plant except for human consumption, for which bottled water would be obtained. Treatment of the well water by reverse osmosis and demineralization would produce the water quality required for the various process purposes (PEC 2006a: pp. 3-13 to 3-17).

Wastewater would be disposed of using a new deep well injection system, requiring the installation of a wastewater collection tank and the drilling of six Class I non-hazardous deep injection wells at a depth of 5,000 feet below ground surface (PEC 2006a: pp. 3-18 to 3-19; Fitzgerald 2007).

Prehistoric Setting

Regional Climatic and Environmental History

Until the late nineteenth century, a large, shallow, seasonal lake, Tulare Lake, was located southeast of the project area. Depending on the lake's fluctuating levels, the project area was at times covered by marshlands whose plant and wildlife resources made it attractive to Native American hunters and fishermen (PEC 2006a: p. 5.7-2). The run-off from rivers rising in the south-central Sierra Nevada fed the lake, so the extent of the lake varied with the season and with regional precipitation. Geologists believe the average level of Tulare Lake fluctuated seven or eight times during the past 11,500 years. The lake level was generally higher during the early Holocene (prior to ~6,200 years before the present (B.P.)), but reached a major highstand from ~750 to 150 years B.P. (Negrini, et al., 2005). In 1862, Tulare Lake reached its highest recorded level, covering 486,000 acres (Lindsay n.d.). Starting in the 1870s, American grain farmers on the east side of the valley began building levees and irrigating crops with water from the rivers that fed Lake Tulare, resulting in its apparent disappearance by 1895 (Menefee and Dodge 1913: Ch. 24). Since then, in especially wet years Tulare Lake reappears as an extensive but shallow flooding of the agricultural fields which replaced it (Balkin, Halbur, and Stringfellow 2006).

Prehistoric Human Occupation in the San Joaquin Valley[2]

California archaeologists have divided the prehistory of the San Joaquin Valley into three periods. The Early Period is the least well known and the least well evidenced in known archaeological sites, but the Middle Period is only marginally better represented. Sites of the Late Period have had the most archaeological attention, and they have been richer in artifacts than sites of the earlier periods. Additionally, since the Late Period ends with the advent of Europeans in California, the historic record provides information on the traditional lifeways of California Native Americans, and this information is useful for interpreting the archaeological sites of the Late Period. Consequently, the reconstruction of prehistoric lifeways for the Late Period is both fuller and better anchored in time than the earlier two periods.

Early Period (~12,000-7,000 B.P.)

The earliest generally accepted evidence for the human occupation of the North American continent, dating from about 12,000 years ago, is the occurrence of large, very skillfully made stone spear points, sometimes in association with the remains of large game animals. This occupation is known archaeologically as the Big Game Hunting Tradition. The Big Game Hunting Tradition, centered in the Great Plains and American Southwest, but evidenced all over the continent, apparently had a nearly exclusive focus on the exploitation of now-extinct giant mammals (megafauna). This tradition coincided with the end of the last major North American glaciation, known geologically as the Late Pleistocene, followed by the Holocene, our own geological era.

Archaeologists believe that California did not have the Big Game Hunting Tradition, although its characteristic fluted projectile points have been found all over the state.

[2] Amanda C. Cannon and Michael K. Lerch, of Statistical Research, Inc., made major contributions to the following discussion of San Joaquin Valley prehistory.

Such projectile points, known as Clovis points, have been recovered from the relict shores of Tulare Lake in association with the bones of such extinct animals as horse, bison, giant sloth, and mammoth/mastodon, indicating a date for the occupation of Tulare Lake before 11,000 B.P. (Moratto 1984: pp. 81-82). Recently, a site at Tulare Lake produced the oldest known human remains in the Americas. These remains, consisting of human cranial fragments, were dated using uranium series methods. As published in the *Federal Register* in 2005, the bones yielded an age of 15,696 ± 370 years. This implies that a human population could have been active in California from the height of the Pleistocene onward (*Federal Register* 2005). When the glaciers of the Pleistocene era retreated and the warmer and drier climate of the Holocene caused the sea level to rise along the coast, the formerly plentiful inland lakes to shrink or dry up, and the extinction of megafauna (Moratto 1984: pp. 78-81), California's late Pleistocene peoples were forced to adopt a general hunter-forager subsistence mode and to live near reliable water sources where food and plant resources were consistently available.

After 7,000 B.P., the present climate and environment were established in California, and Native Americans refined their exploitative abilities by developing their technology and adapting their lifestyle to the seasonal availability of a wide variety of local food sources. For the Early Holocene time period, archaeologists have identified a prevailing region-wide hunting tradition in central and southern California. Moratto presents a discussion of this synthesis of archaeological findings as the "Western Pluvial Lakes Tradition" (WPLT), characterized by: site locations on or near shorelines of bodies of water; an economy based on hunting a variety of animals and birds and on gathering shellfish and vegetal products; the absence of groundstone artifacts (indicative of non-use of hard seeds as food); characteristic percussion-flaked stone artifacts; and a diverse stone toolkit, including a distinctive flaked-stone crescent-shaped tool (Moratto 1984: pp. 90-103). Like fluted projectile points, the WPLT is represented at Tulare Lake, but "it is likely that most of the archaeological evidence of Central Valley habitation prior to circa 4,000-5,000 B.C. lies deeply buried under alluvium" (Moratto 1984: p. 214).

One putatively Early site on the margins of ancient Tulare Lake is the Tranquility site (CA-FRE-48). The site was discovered in 1939 a short distance north of the town of Tranquility, 18 miles east of the PEC project area along the Kings River. Highly mineralized human skeletons of 25 adults, eight children, and two infants were found in apparent association with fossilized bones of extinct bison, camel, and horse, as well as more recent animals. Ultimately, the fossils and human remains were determined to lie in separate strata, and associated artifacts and a radiocarbon date placed the human remains within the late Middle Period at 2,550 B.P. (Angel 1966; Hewes 1946; Moratto 1984: pp. 65-66). Nonetheless, the data from the Tranquility site confirm early human use of marsh resources in the project region.

Middle Period (7,000 to 2,500 B.P.)

The lower San Joaquin Valley "remains one of the least known archaeological areas in California" (Moratto 1984: p. 215). Such San Joaquin Valley sites as are known for this period represent the younger end of the Middle Period time span and evidence a time of significant occupation between 4,000 and 1,500 years B.P. and another between 500 and 150 years B.P. The interval between the two may indicate a period of climatic aridity. The known sites of the period suggest cultural affiliations with both the Santa

Barbara coast and the Mojave Desert, but not with the Delta region to the north (Moratto 1984: p. 215). As elsewhere in California during the equivalent time periods, at this time the increased presence of groundstone milling artifacts, used to process hard seeds into meal, indicates an increased use of vegetal food sources by prehistoric Native Americans in the lower San Joaquin Valley (PEC 2006a App. J: p. 1-10).

Late Period (2,500 to 300 years B.P.)

In this period, known prehistoric sites are, again, not many, but there is evidence that populations expanded and villages increased in numbers after about 500 B.P. in the southern and western parts of the San Joaquin Valley (Moratto 1984: p. 215). The archaeological evidence indicates that significant changes occurred from the Middle to the Late Period. Important differences include: groundstone artifacts associated with acorn processing, bow-and-arrow technology, and large occupation sites representing permanent villages with large, semi-subterranean communal structures (PEC 2006a App. J: p. 1-10).

Local Chronological Sequence

A more detailed local chronological sequence for the western San Joaquin Valley during the Middle and Late periods is based on excavations at sites CA-FRE-128 and 129 at Little Panoche Reservoir (Olsen and Payen 1968); the Grayson site (CA-MER-94) at San Luis Reservoir (Olsen and Payen 1969); CA-MER-130 at Pacheco Pass (Olsen and Payen 1983); CA-MER-3, the Menjoulet site (Pritchard 1970); and CA-MER-119, the San Luis Forebay site (Pritchard 1983). The Merced County sites are located west of Los Banos and approximately 40 miles northwest of the proposed PEC project area, whereas the Fresno County sites at Little Panoche Reservoir are situated about 15 miles northwest of the PEC location.

The earliest period in the western San Joaquin Valley sequence is the Positas Complex (ca. 5,200-4,500 years B.P.), which is characterized by small, shaped mortars, short cylindrical pestles, milling stones, and spire-lopped *Olivella* beads. Positas Complex deposits were the basal cultural component at the Grayson site, where they were overlain by sediments containing an artifact assemblage consistent with the Early period. The Positas complex has not been as well accepted as the other phases in the sequence (Moratto 1984: p. 191), due to anomalous radiocarbon dates from the Grayson site. Dates of 450±100 B.C. and 1305±90 A.D. from the Positas component at the Grayson site are more consistent with the Middle and Late period occupations and indicate that this component is actually younger than the overlying Pacheco deposits.

The succeeding Pacheco complex includes two phases. The earlier one, Pacheco B (ca. 4,500-2,500 years B.P.), is poorly documented but includes characteristic leaf-shaped bifaces, large, stemmed and side-notched points, rectangular *Haliotis* ornaments, and thick rectangular *Olivella* beads, as well as abundant milling stones, mortars, and pestles. The Pacheco A complex (2,500-1,000 years B.P.) is represented by flexed burials associated with distinctive *Olivella* and *Macoma* beads types, both mortars-and-pestles and millingslabs-and-handstones, and a variety of projectile points. The earliest evidence of architecture appears in the form of small, circular houses about 10-12 feet in diameter.

The Gonzaga complex (ca. 1,000-450 years B.P.) is marked by extended and flexed burials, bowl mortars, shaped pestles, relatively rare squared and tapered-stemmed projectile points, distinctive *Haliotis* ornaments, and thin rectangular, split-punched, and oval *Olivella* beads. Bone artifacts include awls, pins, mammal-bone tubes, bird-bone whistles, and grass cutters made from the scapulae of large mammals. Distinctive spool-shaped polished stone ear ornaments and cylindrical plugs are also found. Milling equipment continues include both mortars and millingslabs. House pits increase in size up to 20–30 feet in diameter, some with evidence of center posts.

The protohistoric Panoche complex (450-200 years B.P.) is separated from the earlier Gonzaga complex by a hiatus that may reflect abandonment of the region due to adverse environmental conditions. Panoche complex deposits are identified by large circular structures, up to 75 feet in diameter, and smaller dwellings about 30-50 feet in diameter. Mortuary practices include flexed burials, as well as primary and secondary cremations. Artifacts typical of this complex include small side-notched arrow points and a varied assortment of shell and groundstone artifacts. Beads recovered from Panoche deposits include clamshell disk, *Haliotis* epidermis disk, and *Olivella* lipped, side-ground, and rough disk.

In their review of the above sequences for a regional study, Hildebrandt and Mikkelsen (1993: p. 44) observed:

> Based on regional comparisons of numerous traits, it was noted that each major temporal period seemed to reflect occupations by different populations, or at least populations with divergent cultural/geographic affinities. The Positas Complex, although poorly represented, showed relationships to the south coast while the Pacheco Complex was thought to possibly represent intrusion of peoples from the Monterey Bay area. Most conspicuous of all was the Gonzaga Complex with its extended burials similar to the delta, followed by the protohistoric Panoche Complex, probably representing the ethnographically recorded Yokuts.

Ethnographic Setting

Historians recognize three periods in California: the eighteenth- and nineteenth-century Spanish exploration and settlement, the brief tenure of Mexico, and the subsequent American takeover and annexation. All of the latter periods equate to the ethnographic period for California Native Americans, during which any written records regarding Native Americans, all anthropological writings about Native Americans, and the contributions of Native Americans themselves compose what scholars know about Native American lifeways in California since Euro-American contact.[3]

The project area is located within the boundaries of the Northern Valley Yokuts territory, at the northeastern end of the San Joaquin Valley, south of Panoche Creek. “Yokuts” is a term applied to a large and diverse group of people inhabiting the San Joaquin Valley and Sierra Nevada foothills of central California. The Northern Valley Yokuts inhabited a

[3] The following discussion was adapted from PEC 2006a App. J: pp. 1-11 to 1-12, which relied strongly on Wallace 1978. Additional contributions were made by Amanda C. Cannon and Michael K. Lerch, of Statistical Research, Inc.

40-to-60-mile-wide area straddling the San Joaquin River, south of the Mokelumne River, east of the Diablo Range, and north of the sharp bend that the San Joaquin River takes to the northeast. For the Northern Valley Yokuts, the San Joaquin River and its main tributaries served as a lifeline to the valley, as a source of fish and game, and as an environment favorable to another important food source, the Valley oak.

Although information is limited and often equivocal, ethnographic accounts indicate that as many as 63 groups may have inhabited the Northern Valley Yokuts territory (Latta 1999). According to Latta's (1999) map of the San Joaquin Valley Yokuts region, the Kahwatchwah occupied the area surrounding Little Panoche Creek and the towns of Firebaugh, Los Banos, and Ingomar. A village, Kahtomah, was located just north of Los Banos on the south bank of Los Banos Creek. During the Mission Period, many of the Kahtomah villagers were taken to Mission San Juan Bautista (Latta 1999: p. 145).

Other ethnographic groups within the area and surrounding the Chowchilla and Fresno rivers included the Chauchela and Hueche, respectively. Between the towns of Mendota and Fresno City, the Hoyumne inhabited the area north of the San Joaquin River, whereas the Pitkache occupied the area to the south. For the most part, Wallace (1978) describes a similar distribution of ethnographic groups within the Northern Valley Yokuts territory. However, Wallace (1978: p. 462) identifies the Nopchinchi, rather than the Kahwatchwah, as the group occupying the area west of the San Joaquin River near the towns of Firebaugh, Los Banos, and Ingomar.

The Northern Valley Yokuts built their villages on mounds along river banks to avoid the spring floods which resulted from heavy Sierra snow melts. Living beside rivers and streams provided plentiful river perch, Sacramento pike, salmon, and sturgeon. Hunting provided waterfowl, such as geese and ducks, and animals, such as antelope, elk, and brown bear, although by all indications fish constituted the major portion of the Northern Yokuts diet. The surrounding woodland, grasslands, and marshes provided acorns, seeds, and tule roots. A chief headed each tribal village, which averaged around 300 people. Family houses were round or oval, with sunken floors, a conically shaped pole-frame structure, and woven tule mat coverings. Each village also had a lodge for dances and other community functions, as well as a sweathouse.

The Northern Valley Yokuts used bone harpoon tips for fishing, stone sinkers for nets, chert projectile points for hunting, and mortars, pestles, scrapers, knives, and bone awl tools to process food. Marine shells, traded from coastal tribes, were used for necklaces and other adornments, and marine shell beads sometimes accompanied the dead. The Yokuts used tule reed rafts to navigate the waterways for fishing and fowling. They also manufactured intricate baskets for a variety of purposes, including gathering, storing, cooking, eating, winnowing, and transporting food materials. Very little is known of the Northern Valley Yokuts's clothing, but their tattoos served not only as personal decoration but also as a form of individual identification. The Northern Valley Yokuts either cremated their dead or buried them in a flexed position.

According to early accounts, the Yokuts traded with neighboring tribes and were fairly peaceful. Initially, the Coast Mountain Range served as a natural barrier against heavy recruitment by the coastal Spanish missions. By the early nineteenth century, however, Spanish (and later, Mexican) missionaries began to explore the interior valley,

searching both for fugitive Native American neophytes, who had fled the missions, and for fresh converts. The Yokuts resented the intrusion and eventually stole horses and cattle from ranchos and missions in retaliation. Eventually, the Northern Valley Yokuts were decimated by the usurpation of their land by Mexican rancheros, Forty-Niners, farmers, and by epidemic disease, with malaria, in 1833, being the most devastating.

Historical Setting

Because the aridity of much of the San Joaquin Valley made it unsuitable for the kind of agriculture Euro-Americans practiced, non-Native-American settlement did not occur on any significant scale in the project area until the early twentieth century, when irrigation systems were developed (PEC 2006a. App. J, Attachment D: p. 3).

Spanish Period (1769 to 1821)

Starting in 1769 at what would become San Diego, Spain sought to reinforce its claims to Alta California by establishing a series of missions to pacify and Christianize the Indians of the territory, with the object of making them stable, tax-paying citizens of New Spain. Expeditions in the early nineteenth century, sent from the established coastal missions into the interior to find suitable locations for new missions, were met with resistance from the Native Americans living there, and one explorer-missionary's 1806 journal described the interior as a dry, miserable place, unsuitable for settlement (Smith 2004). Nonetheless, sporadic Spanish, and later Mexican, Russian, and American, explorations in the Great Valley fed international tensions, but resulted in no Euro-American settlement (PEC 2006, p. 5.7-6)

Mexican Period (1821 to 1848)

Mexico gained her independence from Spain in 1821, and Alta California became one of the provinces of the new Republic of Mexico. After the government secularized the missions, starting in 1834, the Mexican governors of Alta California began making large rancho grants of former mission lands to Mexican citizens, particularly to soldiers and members of prominent families who had financed various government initiatives. In the 1840s, the Mexican authorities made a few large rancho grants of San Joaquin valley land, but no actual homesteads were established there under the Spanish or Mexican authorities. Rancho Laguna de Tache, consisting of over 48,000 acres of land straddling the boundary of present-day Fresno and Kings Counties and granted to Mañuel de Jesus Castro in 1846, was the only Mexican land grant in modern Fresno County. The project area was not included in any Mexican land grant (PEC 2006, p. 5.7-6; Herbert, et al. 2006, p. 2).

American Period

With the Mexican cession of Alta California (and much of what would become the American Southwest) at the conclusion of the Mexican War in 1848, the project area came under the control of the United States. The Gold Rush brought settlers to the Upper Kings River part of what would become Fresno County in the 1850s, but the northwestern part of the county, where the project area is located, did not appeal to American settlers. In the 1870s, the arid climate finally caused a community of Basque families who had been raising stock in the area for some 20 years to abandon their

homesteads, and later attempts at the dry farming of wheat and barley in the area were short-lived (PEC 2006a. App. J, Attachment D: p. 3).

Panoche Road, established in the mid-1870s and running southwest from the area of present-day White's Bridge Ferry to the mountains, was the earliest historic-era development in the project area. This road was designated a county road in 1892 and a principal California Automobile Association route in 1914. By 1922, it was the only oiled road in the area. Fresno County's later network of paved and unpaved county and farm roads mostly followed north-south and east-west section lines, but Panoche Road remained distinctive, with its generally diagonal route and gentle curves (PEC 2006a. App. J, Attachment D: p. 5).

By the early twentieth century, irrigated agriculture, using canals to divert the waters of eastern Fresno County rivers, proved the great fertility of the region's soils, and land speculators began buying large parcels west of Mendota in an area called Mendota Plains, which includes the project area. The speculators enticed buyers through promotional campaigns touting the abundant groundwater of the area and the probability of future irrigation projects. Drawing water from shallow wells, farmers near Mendota began irrigating their fields, but suffered crop failures due to the high boron content of the groundwater. During the 1920s, cotton emerged as a valuable crop which thrived despite the boron in the well water. In the late 1920s, the Firebaugh Canal Company was established, drawing water from the San Joaquin River (Stroshane 2002: pp. 4; 7), and with better-quality water now available, west Fresno County farmers began to grow wheat and barley profitably. World War II greatly raised the demand for cotton and grain crops, but after the war local agricultural production diversified into vegetables, melons, flax, and alfalfa, with the aid of federal agricultural subsidies. In 1968, irrigation water from the State Water Project arrived in western Fresno County via the San Luis Canal, located about three miles east of the project area. This continuous supply of good water has allowed the area's agricultural productivity to expand to its present high level (PEC 2006a. App. J, Attachment D: pp. 3-5).

One of the early twentieth-century land speculators left his name on a local landmark: the Chaney Ranch. Andrew J. Chaney, of Hollister, was one of five San Benito County partners who formed the Silver Creek and Panoche Land Company, incorporated in 1891. In 1907, the partnership owned the entire section, Section 5, where the project is located. The Chaney family established the ranch (address: 43405 West Panoche Road) across Panoche Road and just east of the proposed project site. By 1920, the family had moved out of the area and sold Section 5 to a C. D. Hillman, but the "Chaney Ranch" name, first appearing on a 1911 topographic map, endured (PEC 2006a. App. J, Attachment D: p. 6; Department of Parks and Recreation "Building, Structure, and Object" Form for Vaquero Farms/Chaney Ranch).

Resources Inventory

Methods: Records Search, Background Research, and Native American Contacts[4]

The applicant's records search at the California Historical Resources Information System (CHRIS) South San Joaquin Valley Information Center (SSJVIC) at California State University, Bakersfield, sought to identify all known cultural resources located within the boundaries of the proposed plant site, the laydown area, the substation expansion, and within a 0.5-mile-wide area of these parcels (defined as the PEC study area). The records search (SSJVIC file No. 06-160) sought information on any previously identified prehistoric and historic archaeological sites, historic architectural properties, and Native American sacred sites in the 0.5-mile-wide study area (PEC 2006a: pp. 5.7-9 to 5.7-12).

Additionally, Rand F. Herbert, a qualified architectural historian, Steven J. Melvin, and Nathan Hallam, of JRP Historical Consulting, reviewed known inventories of historic properties to identify any known or evaluated historic-period standing structures located within a 0.5-mile-radius around the proposed plant site, laydown area, and substation expansion. They reviewed the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), the list of California Historical Landmarks, and the list of California Points of Historical Interest. They consulted with the Fresno County Assessor's Office, Fresno County Clerk's Office, the Fresno County Planning Department, and the First American Real Estate Property Solutions. They also researched local and regional history at the California State Library, the Shields Library at the University of California, Davis, the Central Library of the Fresno County Public Library System, and the Henry Madden Library of California State University at Fresno (PEC 2006a. App. J, Attachment D, Section 2: p. 1). Additionally, they conducted a field survey of the study area, discussed below.

On April 6, 2006, the applicant wrote to the Native American Heritage Commission, asking that their (NAHC) database of Native American sacred lands be checked for any known properties within a one-mile radius study area and requesting contact information for Native Americans who have expressed an interest in being notified about development projects in Fresno County (PEC 2006a: p. 5.7-9). On May 9, 2006, the applicant sent letters to six Native Americans on the NAHC-provided list, asking them to provide information on any cultural resources which could be affected by the proposed project (PEC 2006a: p. 5.7-9; App. J, Attachment C).

On December 14, 2006, Energy Commission staff also obtained from the NAHC the names and addresses of Native Americans interested in the western Fresno County area. On December 18, 2006, staff sent a letter to 21 Native Americans, informing them of the project and asking that they contact staff if they had any concerns about the project's potential effects on cultural resources.

[4] This section presents the research activities undertaken to inventory known cultural resources. Activities undertaken to identify new resources are presented in the section just below. The findings from all identification activities are presented in the three following sections with headings beginning with "Findings."

When staff learned from the JRP team's report that the Panoche Substation was at least 56 years old (PEC 2006a: p. 5.7-9; App. J: Fig. 2), staff requested that the substation be researched, recorded, and evaluated for significance. To provide a context for the evaluation of the substation, the JRP team researched it, using the CEC California Substation Database, aerial photographs, and histories of PG&E and of California's electrical power development (PEC 2007d: Data Response No. 62; DPR 523 for the Panoche Substation).

When the reconductoring of one mile of the Wilson-Gregg 230-kV transmission line in Madera County and the upgrading of the terminal equipment at the Gregg Substation were identified, in January, 2007, as part of the PEC project, staff requested information about this additional project area in the second round of Data Requests (Data Request Nos. 63-68). Requested information included: a location map of the impact area; details of the construction techniques and potential impacts from them on native soils in the impact area; a CHRIS record search; a search of the Native American Heritage Commission's sacred lands database; an archaeological survey of the area within 50 feet of the centerline of the transmission line; and the recordation and evaluation, by a qualified architectural historian, of the substation and transmission line as potential historically significant structures, if either or both should prove to be 45 years old or older.

Consequently, on February 21, 2007, the applicant obtained a second CHRIS record search from the SSJVIC. The project impact area for the record search was the area within 0.25 mile of all sides of the segment of the Wilson-Gregg transmission line which would be reconductored (PEC 2007d: Data Response 64 Rev). Additionally, Cheryl Brookshear, of JRP Historical Consulting, researched the Wilson-Gregg transmission line and Gregg Substation, reviewing the same sources as were consulted for the historical context of the Panoche substation, above, and established that the transmission line, but not the substation, was older than 45 years (PEC 2007d: Data Response 66 Rev; DRP 523 for the Wilson-Gregg Transmission Line). No other structures in the vicinity of the transmission line or substation were of sufficient age to be considered potential cultural resources.

On February 22, 2007, the applicant made a second request to the NAHC, this time to check the Wilson-Gregg transmission line and Gregg Substation area for possible known Native American sacred sites or traditional cultural properties (Armstrong 2007a). On February 27, 2007, the NAHC responded (Ferguson 2007a). On February 27, 2007, after telephone consultation with Matthew Armstrong, URS archaeologist, Energy Commission staff agreed that the applicant did not need to identify and contact Native Americans having traditional ties to the Wilson-Gregg transmission line and Gregg Substation area because the reconductoring would involve no excavation or significant ground disturbance (Armstrong 2007b).

Methods: Field Surveys

On April 21, 2006, using 5-meter-wide transects, Christine Hacking, a Registered Professional Archaeologist, and Matthew Armstrong conducted an intensive pedestrian survey for archaeological resources on the proposed 12.8-acre power plant parcel, the 8-acre laydown area, and the routes of the access road and the natural gas line (south of West Panoche Road). On June 21, Matthew Armstrong returned to survey the

substation expansion parcel and the alternate natural gas line (north of West Panoche Road), applying the same survey methods (PEC 2006a: pp. 5.7-11 to 5.7-12). Because the yet-to-be-determined disposal site for soils removed from the proposed plant site has not yet been identified, it is not known whether or not it has been surveyed for cultural resources.

On June 5, 2006, Rand F. Herbert, a qualified architectural historian, Steven J. Melvin, and Nathan Hallam, of JRP Historical Consulting, conducted an intensive survey of the buildings and structures immediately adjacent to the proposed plant site parcel, and recorded and evaluated those older than 45 years on Department of Parks and Recreation (DPR) 523 forms (PEC 2006a. App. J, Attachment D, Section 2: p. 1). Additionally, in response to a Data Request from staff, on January 22, 2007, the JRP historical architectural team visited the Panoche Substation to record and evaluate it for CRHR eligibility. The team completed DPR 523 forms for the substation (PEC 2007d: Data Response No. 62; DPR 523 for the Panoche Substation).

The reconductoring of the Wilson-Gregg transmission line necessitated additional field survey for both archaeological and historical architectural resources. On February 14, 2007, in response to staff Data Request No. 65 Rev, Matthew Armstrong conducted a pedestrian archaeological survey of the area 50 feet to either side of the centerline of the one-mile-long Wilson-Gregg transmission line segment (constituting a surveyed corridor 100 feet wide) using 5-meter transects, with ground visibility ranging from 35 to 100% (PEC 2007d: Data Response 65 Rev; letter report dated February 28, 2007). In response to staff Data Request No. 66 Rev, on February 16, 2007, Cheryl Brookshear, a qualified architectural historian, of JRP Consulting, visited and recorded the one-mile segment of the Wilson-Gregg transmission line on DPR 523 “Primary” and “Building, Structure, and Object” forms, including a recommendation regarding the eligibility of this transmission line for the CRHR (PEC 2007d: Data Response 66 Rev; DRP 523 for the Wilson-Gregg Transmission Line).

A geotechnical exploration at the proposed plant site, conducted by the applicant during the period of June 12 through June 16, 2006, was intended to provide soil condition data to aid in the design of plant foundations. The study consisted of 20 borings to a maximum depth of 65 feet below the existing ground surface, placed to correspond to the locations of proposed units and major equipment (PEC 2006a: Appendix L: p. 4).

Findings: Prehistoric and Historical Archaeological Resources Identified and Evaluated for Historical Significance

The applicant’s CHRIS records search (SSJVIC file No. 06-160) sought information on any previously identified prehistoric and historic archaeological sites, historic architectural properties, and Native American sacred sites in the 0.5-mile-wide study area. The records search found that none of the impact areas associated with the proposed project had been previously surveyed. There were four previous cultural resources surveys in the larger study area, but no known cultural resources have been identified in the 0.5-mile-wide study area (PEC 2006a: pp. 5.7-9 to 5.7-12). The nearest known prehistoric sites occur about two miles north of the PEC project area, along Panoche Creek. Several lithic scatters and milling sites were identified, which were probably associated with a nearby single extensive village site (CA-FRE-372). These

sites were characterized as “occupational sites used frequently and over time by the local prehistoric occupants” (Solis 2006: p. 5-3).

The applicant’s second record search (SSJVIC file No. 07-062), for known cultural resources within the Wilson-Gregg transmission line study area (defined as the area within 0.25 mile of all sides of the segment which would be reconductored) identified five previous archaeological surveys, but no known archaeological sites (PEC 2007d: Data Response 64 Rev).

The applicant’s archaeological survey of the proposed PEC plant site, laydown area, access road, natural gas line route, and substation expansion parcel, as discussed above, identified no archaeological resources in those locations (PEC 2006a: p. 5.7-12). Additionally, no archaeological deposits were identified by the applicant’s additional pedestrian archaeological survey of a 100-foot-wide corridor inclusive of the one-mile-long Wilson-Gregg transmission line segment proposed for reconductoring (PEC 2007d: Data Response 65 Rev). The yet-to-be-determined disposal site for soils removed from the proposed plant site has not yet been surveyed for cultural resources, but the applicant has indicated that an agricultural setting is the preferred choice, with the removed soils being spread over some nearby field or fields (PEC 2007a: Response 28 Rev). It is staff’s assumption that there would be no adverse impacts to currently unknown archaeological sites from soil disposal in such a location and in such a manner.

The 20 borings of the geotechnical study were not observed by an archaeologist, but staff finds that the soil descriptions in the report and in the detailed boring logs (PEC 2006a, Appendix L: Figs. A-2 to A-21) are not consistent in color, composition, or content with the kinds of soils usually indicative of archaeological deposits. The geotechnical study, however, speculated on the possibility of encountering subsurface irrigation and water supply lines (PEC 2006a, Appendix L: p. 8). If encountered, these could be considered historical archaeological remains, depending on their age and the level of technology represented. To be historically significant, they would have to be more than 45 years old and would have to be unusual or unique in their materials (non-mass-produced) or in their design.

Based on the negative results of the archaeological literature search and of the field survey for archaeological deposits, staff has concluded that the construction and operation of the PEC would have no impacts on known, significant archaeological resources.

The potential for as-yet-undiscovered archaeological resources, however, is not completely eliminated by the negative findings of the applicant’s two record checks, two archaeological surveys, and the absence of indications of cultural material in the borings of the geotechnical study at the proposed plant site. The presence of several known prehistoric sites about two miles north of the proposed PEC plant site (one of them an extensive habitation site) suggests that the possibility of encountering buried archaeological deposits is not nil in the plant site area. Consequently, staff would have to consider the project’s potential for significant impacts to as-yet-unknown archaeological resources.

Findings: Historic Structures Identified and Evaluated for Historical Significance

The review of known inventories of historic structures carried out by Rand F. Herbert, Steven J. Melvin, and Nathan Hallam, of JRP Historical Consulting, identified no known historic structures either listed or determined eligible for listing within a 0.5-mile-radius study area around the proposed PEC plant site, laydown area, and substation expansion (PEC 2006a. App. J, Attachment D, Section 2: p. 1).

The JRP team's historic architecture intensive field survey entailed field observation and recording. The JRP team produced DPR 523 forms and detailed descriptions and evaluations of CRHR eligibility for several resources located near the proposed plant site (PEC 2006a. App. J, Attachment D: pp. 9-17; PEC 2007d: Data Response No. 62; DPR 523 for the Panoche Substation):

- Three buildings older than 45 years (a large storage building, a residence, and an auxiliary building) in the agricultural complex at 43405 West Panoche Road, known historically as Chaney Ranch;
- A cluster of five farm worker houses located in the northwest corner of Section 5;
- Another cluster of three farm worker houses located north of and just across West Panoche Road from the proposed project site;
- West Panoche Road itself; and
- The Panoche Substation.

The JRP team concluded that none of the evaluated resources was eligible for the CRHR. They recommended the Chaney Ranch agricultural complex at 43405 West Panoche Road as ineligible for the CRHR because none of the three buildings older than 45 years was associated with any significant historic event or person, or possessed architectural merit or distinction. The background historical research did not indicate that A. J. Chaney was a historically significant figure. Moreover, none of the present-day Chaney Ranch buildings could be dated to the establishment of the ranch. Additionally, the three buildings lacked physical integrity due to alterations (PEC 2006a. App. J, Attachment D: pp. 20-22). The two clusters of farm worker houses (one located in the northwest corner of Section 5 and the other across West Panoche Road from the proposed PEC project site) similarly have no association with historically significant events or persons and no architectural merit. They, too, lack integrity, due to dilapidation (PEC 2006a. App. J, Attachment D: pp. 22-23). West Panoche Road itself was recognized as having historically played an important role in the region, but it lacks integrity due to its having been repeatedly improved over the years (PEC 2006a. App. J, Attachment D: pp. 23-24). The Panoche Substation was recommended as ineligible because it meets none of the criteria for the CRHR, and, further, it lacks integrity due to having been upgraded over time (PEC 2007d: Data Response No. 62; DPR 523 for the Panoche Substation).

The JRP evaluation of the Wilson-Gregg transmission line recommended that the transmission line is not eligible for the CRHR because, like the Panoche Substation, it meets none of the criteria for the CRHR, and, further, it lacks integrity due to having been upgraded over time (PEC 2007d: Data Response 66 Rev; DRP 523 for the Wilson-Gregg Transmission Line).

In summary, no standing structures either on or near the proposed power plant have been recommended as eligible for the CRHR, so no assessment of the impacts from the construction or operation of the proposed PEC to this class of cultural resources would be required.

Findings: Ethnographic Resources Identified and Evaluated for Historical Significance

On May 4, 2006, the NAHC informed the applicant that no known Native American cultural resources in the project area were found in the NAHC's sacred lands database. On May 9, 2006, the applicant sent out letters (with maps of the project) to six Native Americans the NAHC identified as concerned about development projects in Fresno County, representing three Native Americans groups. On June 30, 2006, to ensure that all potentially concerned groups were informed, the applicant also made follow-up telephone calls to individuals representing two groups which had not responded to the May 4th letter. Thus, representatives of three groups, the Chaushilha Tribe, the Table Mountain Rancheria, and the Santa Rosa Rancheria were contacted by the applicant. To date, only the representative of one of the responding Native American groups expressed any concern. On June 5, 2006, Brian T. Austin, the Tribal Attorney for the Chaushilha Tribe requested that the Tribal Council be notified if artifacts are found (PEC 2006a: p. 5.7-9; PEC 2006a: Appendix J; Attachment C).

On December 14, 2006, Energy Commission staff also obtained from the NAHC the names and addresses of Native Americans interested in the western Fresno County area. On December 18, 2006, staff sent letters to 21 Native Americans, informing them of the project and asking that they contact staff if they had any concerns about the project's potential effects on cultural resources. To date no responses have been received.

The applicant's requested check of the NAHC's sacred lands database for the Wilson-Gregg transmission line and Gregg Substation area identified no known sacred sites or traditional cultural properties near that potential impact area.

In summary, unless further communications with Native Americans disclose significant sites of ethnographic concern, at this time no significant ethnographic sites have been identified that must be considered when evaluating the impacts of the construction of the PEC.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Various laws apply to the evaluation and treatment of cultural resources. CEQA requires the Energy Commission to evaluate resources by determining whether they meet several sets of specified criteria. These evaluations then influence the analysis of potential impacts to the resources and the mitigation that may be required to ameliorate any such impacts.

The CEQA Guidelines provide a definition of a historical resource as a "resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing

in the CRHR", or "a resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting the requirements of Section 5024.1 (g) of the Public Resources Code," or "any object , building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency's determination is supported by substantial evidence in light of the whole record." (California Code of Regulations, Title 14, section 15064.5(a)). Historical resources that are automatically listed in the CRHR include California historical resources listed in or formally determined eligible for the NRHP and California Registered Historical Landmarks from No. 770 onward (Public Resources Code, Section 5024.1(d)).

Under the CEQA Guidelines, a resource is generally considered to be historically significant if it meets the criteria for listing in the CRHR. These criteria are essentially the same as the eligibility criteria for the NRHP. In addition to being at least 50 years old,[5] a resource must meet at least one of the following four criteria: is associated with events that have made a significant contribution to the broad patterns of our history (Criterion 1); or, is associated with the lives of persons significant in our past (Criterion 2); or, that embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values (Criterion 3); or, that has yielded, or may be likely to yield, information important to history or prehistory (Criterion 4) (Public Resources Code section 5024.1). In addition, historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association (California Code of Regulations, Title 14, section 4852(c)).

Even if a resource is not listed or determined to be eligible for listing in the CRHR, CEQA allows the lead agency to make a determination as to whether the resource is a historical resource as defined in Public Resources Code sections 5020.1 (j) or 5024.1. Whether a proposed project would cause a substantial adverse change in the significance of historical resources is the issue that staff analyzes to determine if the project may have a significant effect on the environment.

GENERAL OVERVIEW OF DIRECT/INDIRECT PROJECT IMPACTS AND MITIGATION FOR CULTURAL RESOURCES

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

[5] The Office of Historic Preservation's Instructions for Recording Historical Resources (1995) endorses recording and evaluating resources over 45 years of age to accommodate a five-year lag in the planning process.

the new structures produce something harmful to the materials or structural integrity of the historic structures, such as emissions or vibrations.

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

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

PEC Construction Impacts and Mitigation

Direct Impacts on Previously Unknown Archaeological Resources and Proposed Mitigation

The applicant's records search revealed no previously recorded archaeological sites located within one-half mile of the study area. Contacted Native Americans also disclosed no archaeological sites in the area. The applicant's field survey of PEC impact areas, similarly, found no archaeological resources in any of the proposed project impact areas. Staff therefore agrees with the applicant that construction impacts from the PEC would affect no known archaeological resources (PEC 2006a: p. 5.7-16), and consequently, no mitigation would be required for known resources.

Because the proposed PEC construction requires subsurface ground disturbance in an area that was utilized in prehistory and history (as indicated in the sections on prehistoric and historic settings), staff must consider the possibility of the PEC project encountering as yet unknown archaeological resources during construction. The possibility of prehistoric deposits is suggested by the propinquity of the prehistoric sites on Panoche Creek, by the resources-rich nature of the marshy early prehistoric landscape, and by the geologic landform on which the proposed PEC would be built—an alluvial fan—which could mask prehistoric archaeological remains under the deposited sediments. In addition, some potential to encounter historical archaeological remains in the form of buried irrigation system lines was noted by the geotechnical study (PEC 2006a, Appendix L: p. 8). If any newly found resources are eligible for the CRHR, the direct impacts from construction could materially impair the resources. Staff anticipates the following kinds of direct impacts to potential but as yet undiscovered archaeological deposits:

- Ground disturbance potentially resulting from the pre-construction removal of from 0-10 feet of the natural soils at the proposed plant site, prior to applying engineered fill to raise the finished site grade to one-to-three feet above the present grade. The soil

removal could directly impact possible archaeological resources, unidentified at this time, which could be present in the native soils of the proposed site;

- The geotechnical study of the plant site recommends that the surface soils either be stripped and replaced to a maximum of ten feet, if mat foundations are to be used, or that driven pile foundations be used without soil improvement. The excavations for foundations and for the underground piping could, therefore, be dug down through undisturbed soils or through as much as 13 feet of disturbed soils. Consequently, project excavations could extend into undisturbed, native soils (PEC 2006a, Appendix L: pp. 9-10, 14);
- Disposal of soils removed from the proposed plant site at an agricultural site, which will be identified later, could result in burial of currently unknown archaeological deposits under the applied soils. Burial in this instance is not considered a significant impact to any known or unknown archaeological deposits;
- Construction of the short (300 feet) 230-kV overhead transmission line would entail installation of five A- or H-frame support structures, 65 feet tall. Two of these would be dead-end structures, one at the east end of the new on-site switchyard, and the other at the Panoche Substation (PEC 2006a: pp. 3-35 to 3-36). The foundations of these structures could entail excavations into either or both imported fill and natural undisturbed soils at the structure locations in the new on-site switchyard and could result in significant impacts to possible buried archaeological resources, unidentified at this time, to the extent of the area and depth of the excavations into undisturbed, natural soils for the foundations;
- The proposed project's new interconnection at the Panoche Substation would require the expansion of the substation's boundaries to the south to accommodate the necessary new equipment (PEC 2006a: p. 3-35). The expansion of the main ground grid and the new lighting and fencing would entail ground disturbance in the area of the expansion and could result in significant impacts to possible buried archaeological resources, unidentified at this time, to the extent of the area and depth of the excavations into undisturbed, natural soils for the equipment, fencing, and lighting foundations;
- The proposed project's new interconnection at the Panoche Substation would require equipment modifications at the substation (PEC 2006a: p. 3-35), but would not be a significant impact because the substation was not recommended as a significant cultural resource (PEC 2007d: Data Response 62 Rev; DRP 523 for the Panoche Substation);
- The reconductoring of one mile of the Wilson-Gregg 230-kV line in Madera County would be accomplished primarily through the use of a helicopter, with a landing location, materials storage, and staging area at the Gregg Substation. Some ground vehicle activity would be necessary, as well, but this would entail vehicles driving in the existing orchards or on existing dirt access roads, with application of rock possibly necessary in some areas, depending on the soil conditions, to improve traction (PEC 2007d: Data Response 67 Rev). This would not result in foreseeable significant impacts to buried archaeological resources;
- The upgrading of the terminal equipment at the Gregg Substation to accommodate the ampacity rating of the new conductors would not be a significant impact because

the substation was not recommended as a significant cultural resource (PEC 2007d: Data Response 66 Rev; DRP 523 for the Wilson-Gregg Transmission Line);

- The 12-inch-diameter, 2,400-foot-long underground natural gas pipeline would be laid in an open trench, which would be four feet deep and 18 inches wide, excavated into mostly undisturbed native soils (PEC 2006a: p. 3-40; Data Response 29 Rev). Installation of this pipeline could directly impact possible buried archaeological resources, unidentified at this time, to the extent of the area and depth of the trench excavation;
- Two wells would be drilled on-site to obtain groundwater for all water needs at the proposed plant except for human consumption (PEC 2006a: pp. 3-13 to 3-17). Drilling wells and excavating water piping trenches through either or both imported fill and natural undisturbed soils could directly impact possible buried archaeological resources, unidentified at this time, to the extent of the area and depth of the well and trench excavations; and
- Six Class I non-hazardous deep injection wells would be drilled to a depth of 5,000 feet below the present ground surface for the disposal of all wastewater except for that resulting from domestic/sanitary uses, which would be sent to a septic tank and leach field (PEC 2006a: pp. 3-18 to 3-19). Drilling wells and excavating water piping trenches through either or both imported fill and natural undisturbed soils could directly impact buried archaeological resources, unidentified at this time, to the extent of the area and depth of the well and trench excavations.

In recognition of the possibility that prehistoric archaeological deposits could be encountered during construction, CEQA advises a lead agency to make provisions for archaeological resources unexpectedly encountered during construction, and the project owner may be required to train workers to recognize cultural resources, fund mitigation, and delay construction in the area of the find (Public Resources Code, section 21083.2; California Code of Regulations, Title 14, sections 15064.5(f) and 15126.4(b)). Consequently, staff recommends that procedures for identifying, evaluating, and possibly mitigating impacts to newly discovered archaeological resources be put into place by means of Conditions of Certification to reduce those impacts to a less than significant level.

The applicant provided six mitigation measures for the appropriate treatment of any known cultural resources identified in the impact areas of the PEC project (PEC 2006a: pp. 5.7-19 to 5.7-20). The applicant also proposed one mitigation measure for the appropriate treatment of buried and previously unknown archaeological resources encountered during construction (PEC 2006a: p. 5.7-20). This measure, applicant's CUL-7, proposes to:

- Attempt avoidance of direct and indirect impacts through design modification or through physical demarcation, crew education, and archaeological and Native American monitoring;
- Determine the significance of the discovered resource through CEC and SHPO consultation with "the project archaeologist," if avoidance is not possible;
- Devise measures to mitigate impacts, in consultation with the CEC and the SHPO, if a discovered resource is determined significant; and

- Carry out those mitigation measures.

All of the treatment procedures proposed by the applicant for both known and newly discovered cultural resources would be incorporated into staff's proposed measures for identifying, evaluating, and possibly mitigating impacts to previously unknown archaeological resources discovered during construction (see "Proposed Conditions of Certification," **CUL-1** through **CUL-7**, after "Conclusions and Recommendations," below). Staff proposes having an archaeologist survey the chosen soil disposal site and record any identified archaeological deposits. Staff also proposes having an archaeologist monitor all construction activities entailing earthwork, and, in addition, for a Native American to join the archaeologist in monitoring construction activities where any prehistoric cultural resources have been discovered. The construction activities which staff would have an archaeologist monitor are:

1. The initial soil stripping of the proposed plant site;

2. The application of removed plant-site soils to the selected disposal site, if archaeological deposits were identified there, so that the archaeologist can direct the burial of the newly identified deposits and prevent damage to them from earthmoving activities;

3. The excavation of all foundation holes on the plant site;

4. The excavation of the trenches for the natural gas pipeline, the process water pipelines, and the wastewater pipelines; and

5. Any soil-disturbing activities associated with the reconductoring of the Wilson-Gregg transmission line.

Staff believes that providing archaeological monitoring is warranted because the area has a long history of human utilization, because a known prehistoric habitation site is located two miles away, because the past ecology of the area would have made it attractive to Native Americans, and because the geology of the area would have contributed to the burial of prehistoric deposits.

Direct Impacts on Historic Structures and Proposed Mitigation

No previously recorded historic structures were identified in the construction zones of the project, so no standing historic structures would be demolished for this project. The field survey for historical architecture identified no significant standing structures within 0.5 mile of the proposed project, so no impact to the integrity of setting, the integrity of association, or the integrity of feeling of any significant standing historic structure would result from the proposed plant's 90-foot-tall combustion turbine stacks introducing a new, vertical, visual element into the wider, otherwise mostly flat historic landscape.

No historically significant standing structures have been identified on or within 0.5 mile of the project site, so no project-related impacts that would materially impair the significance of such resources would occur during PEC construction or operation. Thus, no mitigation measures would be required for this class of cultural resources.

Direct Impacts on Ethnographic Resources and Proposed Mitigation

No ethnographic resources, either previously recorded or newly disclosed in the communications with Native Americans initiated by the applicant for the proposed project, were identified in the vicinity of the project. Consequently, no mitigation measures would be required for this class of cultural resources.

Indirect Impacts

Neither the applicant nor staff identified any indirect impacts to cultural resources in the impact area of the proposed project, and so no mitigation of indirect PEC impacts would be required for any class of cultural resources.

Operation Impacts and Mitigation

During operation of the proposed power plant, if a leak should develop in the gas or water pipelines supplying the plant, repair of the buried utility could require the excavation of a large hole. Such repairs could impact previously unknown subsurface archaeological resources in areas unaffected by the original trench excavation. The measures proposed for mitigating impacts to previously unknown archaeological resources during the construction of the plant and linear facilities (below) would also serve to mitigate impacts from repairs occurring during operation of the plant.

Cumulative Impacts and Mitigation

Cumulative impacts refer to a proposed project's incremental effect, viewed over time, together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Public Resources Code, section 21083.2; California Code of Regulations, Title 14, sections 15064(h), 15065(c), 15130, and 15355).

The construction of other projects in the same vicinity as the proposed project, such as the proposed Starwood Midway Project (06_AFC-10), could affect possible unknown subsurface archaeological deposits (both prehistoric and historic). The implementation of mitigation measures requiring construction monitoring, evaluation of resources discovered during monitoring, and avoidance or data recovery for resources evaluated as significant (eligible for the CRHR) by other, future projects in the same vicinity as the proposed PEC can mitigate impacts to as yet undiscovered subsurface archaeological deposits to a less than significant level. Thus any adverse cumulative impact would probably be mitigated.

COMPLIANCE WITH APPLICABLE LORS

If the Conditions of Certification, below, are properly implemented, the proposed PEC project would result in a less than significant impact on newly found cultural resources or on any known resources which may be impacted in a previously unanticipated manner. The project would therefore be in compliance with CEQA and the other applicable state laws, ordinances, regulations, and standards listed in Table 1.

In its 2000 General Plan, Fresno County established policies promoting the review of proposed projects for potential important archaeological and historic sites, the mitigation

of adverse impacts to such resources, the confidential identification of archaeological resources, Native American consultation, and maintenance of a county index of historic sites and structures (see Table 1).

Staff's Conditions of Certification require specific actions not just to promote but to effect historic preservation and mitigate impacts to all cultural resources in order to ensure CEQA compliance. Consequently, if the PEC implements these conditions, its actions would be consistent with the cultural resources preservation policies of Fresno County.

CONCLUSIONS AND RECOMMENDATIONS

Staff has determined that the PEC would have no impact on known significant archaeological resources, historic structures, or ethnographic resources. With the adoption and implementation of the proposed Conditions of Certification, the PEC would have no impact on potentially significant archaeological resources which may be discovered during construction.

Staff recommends that the Commission adopt the following proposed cultural resources Conditions of Certification (**CUL-1** through **CUL-7**, see below for list and details). These conditions are intended to facilitate the identification and assessment of previously unknown archaeological resources encountered during construction and to mitigate any significant impacts from the project on any newly found resources assessed as significant. To accomplish this, the conditions provide for:

- The hiring of a Cultural Resources Specialist, Cultural Resources Monitors, and Cultural Resources Technical Specialists;
- The archaeological survey of the as yet unidentified soil disposal location;
- Cultural resources awareness training for construction workers;
- The archaeological and Native American (if needed) monitoring of ground-disturbing activities;
- The recovery of significant data from discovered archaeological deposits;
- The writing of a technical archaeological report on monitoring activities and findings; and
- The curation of recovered artifacts and associated notes, records, and reports.

When properly implemented and enforced, staff believes that these Conditions of Certification would mitigate any impacts to unknown significant archaeological resources newly discovered in the project impact areas to a less than significant level.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of preconstruction site mobilization; construction ground disturbance; construction grading, boring, and trenching; and construction, the project owner shall obtain the services of a Cultural Resources Specialist (CRS), and one or more alternates, if alternates are needed. The CRS shall manage all monitoring, mitigation, curation and reporting activities required in

accordance with the Conditions of Certification (Conditions). The CRS may elect to obtain the services of Cultural Resources Monitors (CRMs) and other technical specialists, if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure that the CRS makes recommendations regarding the eligibility to the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner (Discovery). No preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, or construction shall occur prior to CPM approval of the CRS, unless specifically approved by the CPM. Approval of a CRS may be denied or revoked for non-compliance on this or other projects.

CULTURAL RESOURCES SPECIALIST

The resumes for the CRS and alternate(s) shall include information demonstrating to the satisfaction of the CPM that their training and backgrounds conform to the U.S. Secretary of Interior's Professional Qualifications Standards, as published in the Code of Federal Regulations, 36 CFR Part 61. In addition, the CRS shall have the following qualifications:

1. The CRS's qualifications shall be appropriate to the needs of the project and shall include a background in anthropology, archaeology, history, architectural history, or a related field; and

2. At least three years of archaeological or historic, as appropriate, resources mitigation and field experience in California.

3. At least one year of experience in a decision-making capacity on cultural resources projects in California and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources.

The resumes of the CRS and alternate CRS shall include the names and telephone numbers of contacts familiar with the work of the CRS/alternate CRS on referenced projects and demonstrate to the satisfaction of the CPM that the CRS/alternate CRS has the appropriate training and experience to effectively implement the Conditions of Certification.

CULTURAL RESOURCES MONITORS

CRMs shall have the following qualifications:

1. a BS or BA degree in anthropology, archaeology, historical archaeology or a related field and one year experience monitoring in California; or

2. an AS or AA degree in anthropology, archaeology, historical archaeology or a related field, and four years experience monitoring in California; or

3. enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology or a related field, and two years of monitoring experience in California.

CULTURAL RESOURCES TECHNICAL SPECIALISTS

The resume(s) of any additional technical specialists, e.g., historical archaeologist, historian, architectural historian, and/or physical anthropologist, shall be submitted to the CPM for approval.

Verification:

1. At least 45 days prior to the start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, the project owner shall submit the resume for the CRS, and alternate(s) if desired, to the CPM for review and approval.

2. At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval. At the same time, the project owner shall also provide to the approved new CRS the AFC and all cultural documents, field notes, photographs, and other cultural materials generated by the project.

3. At least 20 days prior to preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, the CRS shall provide a letter naming anticipated CRMs for the project and stating that the identified CRMs meet the minimum qualifications for cultural resources monitoring required by this Condition. If additional CRMs are obtained during the project, the CRS shall provide additional letters to the CPM identifying the CRMs and attesting to the qualifications of the CRMs, at least five days prior to the CRMs beginning on-site duties.

4. At least 10 days prior to beginning tasks, the resume(s) of any additional technical specialists shall be provided to the CPM for review and approval.

5. At least 10 days prior to the start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources Conditions.

CUL-2 Prior to the start of preconstruction site mobilization; construction ground disturbance; construction grading, boring, and trenching; and construction, if the CRS has not previously worked on the project, the project owner shall provide the CRS with copies of the AFC, data responses, and confidential cultural resources reports for the project. The project owner shall also provide the CRS and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps shall include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1” = 200’) for plotting cultural features or materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to

the CRS and CPM. The CPM shall review submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities.

If construction of the project would proceed in phases, maps and drawings, not previously provided, shall be submitted prior to the start of each phase. Written notification identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

At a minimum, the CRS shall consult weekly with the project construction manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases. No preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, or construction shall occur prior to CPM approval of maps and drawings, unless specifically approved by the CPM.

Verification:

1. At least 40 days prior to the start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, the project owner shall provide the AFC, data responses, and confidential cultural resources documents to the CRS, if needed, and the subject maps and drawings to the CRS and CPM. The CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities.

2. If there are changes to any project related-footprint, revised maps and drawings shall be provided at least 15 days prior to start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction for those changes.

3. If project construction is phased, if not previously provided, the project owner shall submit the subject maps and drawings 15 days prior to each phase.

4. On a weekly basis during preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, a current schedule of anticipated project activity shall be provided to the CRS and CPM by letter, email, or fax.

5. Within five days of identifying changes, the project owner shall provide written notice of any changes to scheduling of construction phase.

CUL-3 Prior to the start of preconstruction site mobilization; construction ground disturbance; construction grading, boring, and trenching; and construction, the project owner shall submit the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by or under the direction of the CRS, to the CPM for review and approval. The CRMMP shall be provided in the Archaeological Resource Management Report (ARMR) format, and, per ARMR guidelines, the author's name shall appear on the title page of the

CRMMP. The CRMMP shall identify general and specific measures to minimize potential impacts to sensitive cultural resources. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, each monitor, and the project owner's on-site construction manager. No preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, or construction shall occur prior to CPM approval of the CRMMP, unless specifically approved by the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures:

1. A proposed general research design that includes a discussion of archaeological research questions and testable hypotheses specifically applicable to the project area, and a discussion of artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design. A prescriptive treatment plan may be included in the CRMMP for limited resource types. A refined research design will be prepared for any resource where data recovery is required.

2. The following statement included in the Introduction: "Any discussion, summary, or paraphrasing of the Conditions in this CRMMP is intended as general guidance and as an aid to the user in understanding the Conditions and their implementation. The Conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the Conditions in the CRMMP. The Cultural Resources Conditions of Certification from the Commission Decision are contained in Appendix A."

3. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during ground disturbance, construction, and post-construction analysis phases of the project.

4. Identification of the person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team.

5. A description of the manner in which Native American observers or monitors will be included, the procedures to be used to select them, and their role and responsibilities.

6. A description of all impact avoidance measures (such as flagging or fencing), to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The description shall address how these measures would be implemented prior to the start of construction and how long they would be needed to protect the resources from project-related effects.

7. A statement that all cultural resources encountered shall be recorded on a DPR form 523 and mapped and photographed. In addition, all archaeological materials retained as a result of the archaeological investigations (survey, testing, data recovery) shall be curated in accordance with the California State Historical Resources Commission's "Guidelines for the Curation of Archaeological Collections," into a retrievable storage collection in a public repository or museum.

8. A statement that the project owner will pay all curation fees and a copy of an agreement with, or other written commitment from, a curation facility to accept artifacts from this project. Any agreements concerning curation will be retained and available for audit for the life of the project.

9. A statement that the CRS has access to equipment and supplies necessary for site mapping, photography, and recovery of any cultural resources materials that are encountered during construction and cannot be treated prescriptively.

10. A description of the contents and format of the Cultural Resources Report (CRR), which shall be prepared according to ARMR Guidelines.

Verification:

1. At least 30 days prior to the start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, the project owner shall submit the subject CRMMP to the CPM for review and approval. Preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, or construction may not commence until the CRMMP is approved, unless specifically approved by the CPM.

2. At least 30 days prior to the start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, a letter shall be provided to the CPM indicating that the project owner agrees to pay curation fees for any materials collected as a result of the archaeological investigations (survey, testing, data recovery).

CUL-4 The project owner shall submit the Cultural Resources Report (CRR) to the CPM for approval. The CRR shall be written by or under the direction of the CRS and shall be provided in the ARMR format. The CRR shall report on all field activities including dates, times and locations, findings, samplings, and analyses. All survey reports, Department of Parks and Recreation (DPR) 523 forms, and additional research reports not previously submitted to the California Historical Resources Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as an appendix to the CRR.

If the project owner requests a suspension of construction activities, then a draft CRR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM for review and approval on the same day as the suspension/extension request. The

draft CRR shall be retained at the project site in a secure facility until construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRR shall be submitted to the CPM for review and approval at the same time as the withdrawal request.

Verification:

1. Within 90 days after completion of ground disturbance (including landscaping), the project owner shall submit the CRR to the CPM for review and approval. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.

2. Within 10 days after CPM approval, the project owner shall provide documentation to the CPM confirming that copies of the CRR have been provided to the SHPO, the CHRIS, and the curating institution, if archaeological materials were collected.

3. Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRR to the CPM for review and approval.

CUL-5 Prior to and for the duration of preconstruction site mobilization; construction ground disturbance; construction grading, boring, and trenching; and construction, the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment. The training shall be prepared by the CRS, may be conducted by any member of the archaeological team, and may be presented in the form of a video. The CRS shall be available (by telephone or in person) to answer questions posed by employees. The training shall include:

1. A discussion of applicable laws and penalties under the law;

2. Samples or visuals of artifacts that might be found in the project vicinity;

3. Instruction that the CRS, alternate CRS, and CRMs have the authority to halt construction in the area of a Discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;

4. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources Discovery and shall contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;

5. An informational brochure that identifies reporting procedures in the event of a Discovery;

6. An acknowledgement form signed by each worker indicating that they have received the training; and

7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

No preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, or construction, shall occur prior to implementation of the WEAP program, unless specifically approved by the CPM.

Verification:

1. At least 30 days prior to the beginning of pre-construction site mobilization, the CRS shall provide the training program draft text and graphics and the informational brochure to the CPM for review and approval, and the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign.

2. On a monthly basis, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of persons who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-6 The project owner shall ensure that the CRS, alternate CRS, or CRMs shall monitor preconstruction site mobilization; construction ground disturbance; construction grading, boring, and trenching; and construction full time at the project site and linear facilities, and ground disturbance full time at laydown areas or other ancillary areas, to ensure there are no impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner (Discovery). Specifically, an archaeologist shall monitor the initial tree removal and soil stripping at the proposed plant site; the excavation of all foundation holes; and the excavation of the trenches for the natural gas pipeline, the process water pipelines, and the wastewater pipelines.

Full-time archaeological monitoring for this project shall be the archaeological monitoring of all earth-moving activities on the construction site, or along the linear facility routes, or at the soil disposal site for as long as the activities are ongoing. Full-time archaeological monitoring shall require one monitor per active earthmoving machine working in archaeologically sensitive areas, as determined by the CRS in consultation with the CPM.

In the event that the CRS determines that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered.

On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of non-compliance with the Conditions and/or applicable LORS. Copies of the daily logs shall be provided to the CPM by the CRS as directed by the CPM. The CRS shall use these logs to compile a monthly summary report on the

progress or status of cultural resources-related activities. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended. The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resources monitoring and mitigation activities with Energy Commission technical staff (Staff).

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these Conditions.

Upon becoming aware of the situation, the CRS and/or the project owner shall notify the CPM by telephone or e-mail within 24 hours of any incidents of non-compliance with the Conditions and/or applicable LORS. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the Conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

A Native American monitor shall be obtained to monitor ground disturbance in areas where Native American artifacts are discovered. Informational lists of concerned Native Americans and Guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that is being monitored.

Verification:

1. At least 30 days prior to the start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, the CPM will provide to the CRS reproducible copies of forms to be used as daily monitoring logs.

2. Each day that no Discoveries are made, the CRS shall provide a statement that “no cultural resources over 50 years of age were discovered” to the CPM as an email or in some other form acceptable to the CPM, except during suspension of monitoring or when monitoring has concluded.

3. On a monthly basis, while monitoring is on-going, the project owner shall include in each MCR a copy of the monthly summary report of cultural resources-related monitoring prepared by the CRS. Copies of daily logs shall be retained by the project owner and made available for audit by the CPM.

4. At least 24 hours prior to implementing a proposed change in monitoring level, documentation justifying the change shall be submitted to the CPM for review and approval.

CUL-7 The project owner shall grant authority to halt construction to the CRS, alternate CRS, and the CRMs in the event of a Discovery. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event cultural resources over 50 years of age or, if younger, considered exceptionally significant are found, or impacts to such resources can be anticipated, construction shall be halted or redirected in the immediate vicinity of the Discovery sufficient to ensure that the resource is protected from further impacts. The halting or redirection of construction shall remain in effect until the CRS has visited the Discovery, and all of the following have occurred:

1. The CRS has notified the project owner, and the CPM has been notified within 24 hours of the Discovery, or by Monday morning if the cultural resources Discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the Discovery (or changes in character or attributes), the action taken (i.e. work stoppage or redirection), a recommendation of eligibility, and recommendations for mitigation of any cultural resources Discoveries, whether or not a determination of significance has been made.

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

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

Verification:

1. At least 30 days prior to the start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, alternate CRS, and CRMs have the authority to halt construction activities in the vicinity of a cultural resources Discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a Discovery, or by Monday morning if the cultural resources Discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.

2. Completed DPR form 523s shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the completion of data recordation/recovery, whichever is more appropriate for the subject cultural resource, as determined by the CRS.

CUL-8 As soon as a disposal site for removed plant-site soils is selected, and prior to the start of pre-construction site mobilization; construction ground disturbance; construction grading, boring, and trenching; and construction, the CRS shall undertake or supervise the surface survey of the disposal site for archaeological deposits. If no such are identified, soil disposal at the selected site may proceed with no restrictions. If any such are discovered, the CRS shall undertake or supervise the recording of all discovered sites on DPR 523 "Primary" forms, provide recommendations regarding their eligibility for the CRHR in the "Description" field of the form, and provide a letter report of the survey's personnel, methods, and findings, along with the completed forms, to the CPM. No soil disposal activities shall begin on the soil disposal site before CPM approval of the letter report and any accompanying forms, unless specifically approved by the CPM.

Verification: After the selection of the removed-soils disposal site, and at least 30 days prior to the start of preconstruction site mobilization, the project owner shall ensure that the CRS submits to the CPM a letter report of the conduct and results of the archaeological survey of that site, along with any completed DPR 523 forms with recommendations regarding the eligibility of the recorded resources.

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HAZARDOUS MATERIALS MANAGEMENT

Rick Tyler and Alvin Greenberg PhD

SUMMARY OF CONCLUSIONS

Staff's has concluded that the use of hazardous materials at the proposed facility, with staff's proposed mitigation measures, would not pose a significant risk to the public. The analysis of hazardous materials management does not address potential impacts on the environment other than on the public. If there is a potential for hazmat impacts on the environment such impacts are addressed in the appropriate sections of staff's analysis. For example potential impacts on ground or surface water would be addressed in the Water Resources analysis.

With adoption of the proposed conditions of certification, the proposed project will comply with all applicable laws, ordinances, regulations and standards. In response to Health and Safety Code, section 25531, et seq., the applicant would be required to develop a Risk Management Plan. To insure adequacy of the Risk Management Plan, staff's proposed conditions of certification would require that the Risk Management Plan be submitted for concurrent review by United States Environmental Protection Agency, Fresno County Department of Community Health, Environmental Health Division, and the California Energy Commission staff. In addition, staff's proposed conditions of certification require Fresno County Department of Community Health, Environmental Health Division's review, and staff review and approval of the Risk Management Plan prior to delivery of any hazardous materials to the facility. Other proposed conditions of certification address the issue of the transportation, storage, and use of aqueous ammonia.

INTRODUCTION

The purpose of this Hazardous Materials Management analysis is to determine if the proposed Panoche Energy Center (PEC) has the potential to cause significant impacts on the public as a result of the use, handling, storage, or transportation 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 provide employees with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials. The **Worker Safety and Fire Protection** section of this document describes the requirements applicable to the protection of workers from such risks.

Aqueous ammonia (19% ammonia in aqueous solution) is the only hazardous material proposed to be used or stored at the PEC in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j) (PEC

2006a, Table 5.15-2). Aqueous ammonia will be used for controlling oxides of nitrogen (NO_X) emissions through selective catalytic reduction. The use of aqueous ammonia significantly reduces the risk that would otherwise be associated with use of the more hazardous anhydrous form of ammonia. The high internal energy associated with the high pressure storage of the anhydrous form of ammonia can act as a driving force in an accidental release. Such a release can rapidly introduce large quantities of the material into the ambient air and result in high down-wind concentrations. Spills associated with the aqueous form are much easier to contain than those associated with anhydrous ammonia and emissions from such spills are limited by the slow mass transfer from the surface of the spilled material.

Other hazardous materials, such as mineral and lubricating oils, corrosion inhibitors and water conditioners, will be present at the proposed facility. Hazardous materials used during the construction phase include gasoline, diesel fuel, motor oil, hydraulic fluid, welding gases, lubricants, solvents, paint, and paint thinner. No acutely toxic hazardous materials will be used onsite during construction. None of these materials pose significant potential for off-site impacts as a result of the quantities on-site, their relative toxicity, their physical state, and/or their environmental mobility. Although no natural gas is stored, the project will also involve the handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion. Natural gas will be delivered to the facility through approximately 2,400 feet of 16-inch pipeline that will connect to PG&E's gas trunk line located east of its Panoche electrical substation. This pipeline will then connect to a new metering station and on-site piping on the east-side of the project site (PEC 2006a, Section 3.4.6). The PEC project will also require the transportation of aqueous ammonia to the facility. This document addresses all potential impacts associated with the use and handling of hazardous materials.

LAWS, ORDINANCES, REGULATION, AND STANDARDS

The following federal, State, and local laws, ordinances, regulations, and standards (LORS) apply to the protection of public health and hazardous materials management. Staff's analysis examines the project's compliance with these requirements.

HAZARDOUS MATERIALS MANAGEMENT Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
The Superfund Amendments and Reauthorization Act of 1986 (42USC§9601 et seq.)	Contains the Emergency Planning and Community Right To Know Act (also known as SARA Title III)
Clean Air Act (CAA) of 1990 (42 USC 7401 et seq.as amended)	Establishes a nationwide emergency planning and response program and imposes reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials.
The CAA section on Risk Management Plans (42 USC §112(r)	Requires the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of both SARA Title III and the CAA are reflected in the California Health and Safety Code, section 25531, et seq.
49 Code of Federal Regulations Parts 172-800 (49 CFR 172-800)	U.S. Department of Transportation (U.S. DOT) requirement that suppliers of hazardous materials prepare and implement security plans.
49 CFR Part 1572, Subparts A and B	Requires suppliers of hazardous materials to ensure that all their hazardous materials drivers are in compliance with personnel background security checks.
The Clean Water Act (CWA) (40 CFR 112)	Aims to prevent the discharge or threat of discharge of oil into navigable waters or adjoining shorelines. Requires a written Spill Prevention, Control, and Countermeasures (SPCC) plan to be prepared for facilities that store oil that my leak into navigable waters.
49 CFR Part 190	Outlines gas pipeline safety program procedures.
49 CFR Part 191	Addresses transportation of Natural and Other Gas by Pipeline: Annual Reports, Incident Reports, and Safety-Related Condition Reports, requires operators of pipeline systems to notify the U.S. Department of Transportation of any reportable incident by telephone and then submit a written report within 30 days.

49 CFR Part 192	Addresses transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, specifies minimum safety requirements for pipelines and includes material selection, design requirements, and corrosion protection. The safety requirements for pipeline construction vary according to the population density and land uses that characterize the surrounding land. This part also contains regulations governing pipeline construction that must be followed for Class 2 and Class 3 pipelines, and requirements for preparing a Pipeline Integrity Management Program.
State	
The California Health and Safety Code, section 25534 and Title 19, California Code of Regulations (Cal Code Regs.) Section 2770.5	Directs facility owners, storing or handling regulated substances (formerly called "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 California Accidental Release Prevention Program (CalARP) supersedes the California Risk Management and Prevention Plan (RMPP).
Title 8, Cal. Code Regs., 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, Cal. Code Regs., Section 458 and Sections 500 to 515	Set forth requirements for design, construction and operation of vessels and equipment used to store and transfer ammonia. These sections generally codify the requirements of several industry codes, including the American Society for Material Engineering (ASME) Pressure Vessel Code, the American National Standards Institute (ANSI) K61.1 and the National Boiler and Pressure Vessel Inspection Code. These codes apply to anhydrous ammonia but are also used to design storage facilities for aqueous ammonia.
California Health and Safety Code, Section 41700	Requires that "No person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property."

California Safe Drinking Water and Toxic Enforcement (Proposition 65) Act	Prevents certain chemicals that cause cancer and reproductive toxicity to be discharged into sources of drinking water.
Local	
Fresno County Department of Community Health, Environmental Health Division	Requires new/modified businesses to complete a Hazardous Materials Business Plan and RMP prior to final plan/permit approval

The Certified Unified Program Authority (CUPA) with responsibility to review RMPs and Hazardous Materials Business Plans is the Fresno County Department of Community Health, Environmental Health Division. In regards to seismic safety issues, the site is located in Seismic Zone 4. Construction and design of buildings and vessels storing hazardous materials will meet the seismic requirements of California Code of Regulations, Title 24 and the 2001 California Building Code.

SETTING

Several factors associated with the area in which a project is to be located affect the potential for an accidental release of a hazardous material to cause public health impacts. These include:

- local meteorology;
- terrain characteristics; and
- location of population centers and sensitive receptors relative to the project.

METEOROLOGICAL CONDITIONS

Meteorological conditions, including wind speed, wind direction and air temperature, affect the extent to which accidentally released hazardous materials would be dispersed into the air and the direction in which they would be transported. This affects the potential magnitude and extent of public exposure to such materials, as well as the associated health risks. When wind speeds are low and the atmosphere is stable, dispersion is severely reduced and can lead to increased localized public exposure.

Recorded wind speeds and ambient air temperatures are described in the Air Quality section 5.2 and appendix I of the Application for Certification (AFC) (PEC 2006a). Staff agrees with the applicant that use of F stability (stagnant air, very little mixing), wind speed of 1.5 meters per second, and a temperature of 77.0° Fahrenheit is appropriate for conducting the Offsite Consequence Analysis (PEC 2006a, Section 5.15.2.3.1). Staff believes these represent a reasonably conservative scenario and thus reflects worst case atmospheric conditions.

TERRAIN CHARACTERISTICS

The location of elevated terrain 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 site's topography gently slopes at a downhill 1% grade to the southeast. The average elevation for the site is about 420 feet above mean sea level. The surface is composed of sands, silts, and clays (PEC 2006a, Section 3.3.1).

LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses. In addition, the location of the population in the area surrounding a project site may have a large bearing on health risk. Section 5.15.2.3.4 of the AFC states there are no locations such as hospitals, schools or day care centers where significant number of sensitive individuals are typically present within 0.3 miles of the site. The only residence is 0.25 miles from the power plant site and all others are well beyond the toxic endpoint zone.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD FOR DETERMINING SIGNIFICANCE

Staff reviewed and assessed the potential for the transportation, handling, and use of hazardous materials to impact the surrounding community. All chemicals and natural gas were evaluated. Staff's analysis addresses potential impacts on all members of the population including the young, the elderly, and people with existing medical conditions that may make them more sensitive to the adverse effects of hazardous materials. In order to accomplish this goal, staff utilizes the most current acceptable public health exposure levels (both acute and chronic) set to protect the public from the effects of an accidental chemical release.

In order to assess the potential for released hazardous materials to travel off-site and affect the public, staff analyzed several aspects of the proposed use of these materials at the facility. Staff recognizes that some hazardous materials must be used at power plants. Therefore, staff conducted its analysis by examining the choice and amount of chemicals to be used, the manner in which the applicant will use the chemicals, the manner it will be transported to the facility and transferred to facility storage tanks, and the way the applicant plans to store the materials on-site.

Staff reviewed the applicant's proposed engineering controls and administrative controls concerning hazardous materials usage. Engineering controls are those physical or mechanical systems, such as storage tanks or automatic shut-off valves, that can prevent a spill of hazardous material from occurring or which can limit the spill to a small amount or confine it to a small area. Administrative controls are those rules and procedures that workers at the facility must follow that will help to prevent accidents or keep them small if they do occur. Both engineering and administrative controls can act as methods of prevention or as methods of response and minimization. In both cases, the goal is to prevent a spill from moving off-site and causing harm to the public.

Staff reviewed and evaluated the applicant's proposed use of hazardous materials as described in the AFC (PEC 2006a, Section 5.15). Staff's assessment followed the five steps listed below:

- Step 1: Staff reviewed the chemicals and the amounts proposed for on-site use as listed in Table 5.15-2 of the AFC and determined the need and appropriateness of their use.
- Step 2: Those chemicals, proposed for use in small amounts or whose physical state is such that there is virtually no chance that a spill would migrate off the site and impact the public, were removed from further assessment.
- Step 3: Measures proposed by the applicant to prevent spills were reviewed and evaluated. These included engineering controls such as automatic shut-off valves and different size transfer-hose couplings and administrative controls such as worker training and safety management programs.
- Step 4: Measures proposed by the applicant to respond to accidents were reviewed and evaluated. These measures also included engineering controls such as catchment basins and methods to keep vapors from spreading and administrative controls such as training emergency response crews.
- Step 5: Staff analyzed the theoretical impacts on the public of a worst-case spill of hazardous materials even with the mitigation measures proposed by the applicant. When mitigation methods proposed by the applicant are sufficient, no further mitigation is recommended. If the proposed mitigation is not sufficient to reduce the potential for adverse impacts to a level that is less than significant, staff will propose additional prevention and response controls until the potential for causing harm to the public is reduced to a level that is less than significant. It is only at this point that staff can recommend approval of the facility's use of hazardous materials.

DIRECT/INDIRECT IMPACTS AND MITIGATION SMALL QUANTITY HAZARDOUS MATERIALS

In conducting the analysis, staff determined in Steps 1 and 2 that some materials, although present at the proposed facility, pose a minimal potential for off-site impacts as they will be stored in a solid form or in small quantities, have low mobility, or have low levels of toxicity. These hazardous materials, which were eliminated from further consideration, are discussed briefly below.

During the construction phase of the project, the only hazardous materials proposed for use include paint, paint thinner, cleaners, solvents, sealants, gasoline, diesel fuel, motor oil, hydraulic fluid, lubricants, and welding flux. Any impact of spills or other releases of these materials will be limited to the site due to the small quantities involved, the infrequent use and hence reduced chances of release, and/or the temporary containment berms used by contractors. Petroleum hydrocarbon-based motor fuels, mineral oil, lube oil, and diesel fuel are all of very low volatility and represent limited off-site hazard even in larger quantities.

During operations, hazardous chemicals such as hydraulic and lubricating oils and other various chemicals (see **Hazardous Materials Appendix C** for a list of all

chemicals proposed to be used and stored at PEC), would be used and stored in relatively small amounts and represent limited off-site hazard due to their small quantities, low volatility, and/or low toxicity.

Sodium hypochlorite, sodium hydroxide, and sulfuric acid will be stored on-site but do not pose a risk of off-site impacts because the volumes stored will be less than 5000 gallons, they have relatively low vapor pressures, and down wind concentrations resulting from such spills would be confined to the site due to the slow evaporation rates of these hazardous materials form the spill. In 1995, staff conducted a quantitative assessment of the potential for impact associated with sulfuric acid use, storage, and transportation. Staff concluded that no hazard would be posed to the public due to the extremely low volatility of this aqueous solution of sulfuric acid. However, in order to protect against risk of fire, staff proposes condition of certification **HAZ-5** which will require that no combustible or flammable material is stored within 50 feet of the sulfuric acid tank. **HAZ-3** addresses the need to prevent the accidental mixing of sulfuric acid with aqueous ammonia.

After removing from consideration those chemicals that pose no risk of off-site impact in Steps 1 and 2, staff continued with Steps 3, 4, and 5 to review the remaining hazardous materials: natural gas and aqueous ammonia.

Large Quantity Hazardous Materials

Natural Gas

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

While natural gas will be used in significant quantities, it will not be stored on-site. The risk of a fire and/or explosion on-site can be reduced to insignificant levels through adherence to applicable codes and development and implementation of effective safety management practices. The National Fire Protection Association (NFPA 85A) requires 1) the use of double block and bleed valves for gas shut-off; and 2) automated combustion controls. These measures will significantly reduce the likelihood of an explosion in gas-fired equipment. Additionally, start-up procedures would require air purging of the gas turbines prior to start-up, thus precluding the presence of an explosive mixture. The safety management plan proposed by the applicant would address the handling and use of natural gas and significantly reduce the potential for equipment failure due to improper maintenance or human error. The proposed facility will not require the installation of any new off-site gas pipeline.

Aqueous Ammonia

Aqueous ammonia will be used in controlling NOx emissions from the combustion of natural gas in the facility. The accidental release of aqueous ammonia without proper mitigation can result in significant down-wind concentrations of ammonia gas. A single 20,000-gallon capacity above-ground storage tank will be used to store the 19% aqueous ammonia (PEC 2006a, section 5.15.2.3).

Based on staff's analysis, as described above, aqueous ammonia is the only hazardous material that may pose a risk of off-site impacts. The use of aqueous ammonia can result in the formation and release of toxic gases in the event of a spill even without interaction with other chemicals. This is a result of its moderate vapor pressure and the large amounts of aqueous ammonia that will be used and stored on-site. However, as with sodium hypochlorite solution, the use of aqueous ammonia instead of the much more hazardous anhydrous ammonia (i.e. ammonia that is not diluted with water) poses far less risk.

To assess the potential impacts associated with an accidental release of aqueous ammonia, staff uses the four "bench mark" exposure levels of ammonia gas occurring off-site. These include: 1) the lowest concentration posing a risk of lethality of 2,000 parts per million (ppm); 2) the Immediately Dangerous to Life and Health (IDLH) level of 300 ppm; 3) the Emergency Response Planning Guideline (ERPG) level 2 of 150 ppm, 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 is 75 ppm averaged over 30 minutes. An accidental release causing exposures above 75 ppm is unlikely and is not expected to occur during the life of the project. Thus, any plausible exposures due to a potential accidental release that produce exposures below 75 ppm will be considered insignificant. If staff's analysis determines that the potential exposure associated with a potential release exceeds 75 ppm at any public receptor, staff will assess the probability of occurrence of the release and/or the nature of the potentially exposed population in determining whether the likelihood and extent of potential exposure are sufficient to support a finding of potentially significant impact. A detailed discussion of the exposure criteria considered by staff and their applicability to different populations and exposure-specific conditions is provided in **Hazardous Materials Appendices A & B.**

Section 5.15.2.3 of the AFC (PEC 2006a), describe the modeling parameters used for the worst case accidental releases of aqueous ammonia in the applicant's Offsite Consequence Analysis (OCA). This modeling used a numerical air dispersion model for a worst-case release associated with a failure of the storage tank into the containment area and subsequent flow into the planned subsurface vault.

Staff has reviewed the applicant's aqueous ammonia modeling calculations and conclusions. Staff believes that due to the engineering controls proposed by the applicant for the storage and transfer of aqueous ammonia, any potential accidental release of aqueous ammonia at the project site will not cause a significant impact and will not represent a significant risk to the public.

Mitigation

The potential for accidents resulting in the release of hazardous materials is greatly reduced by the implementation of a safety management program, which includes the use of both engineering and administrative controls. Elements of facility controls and the safety management plan, as required by condition of certification HAZ-3, are summarized below.

Engineering Controls

Engineering controls help to prevent accidents and releases (spills) from moving off-site and impacting the community by incorporating engineering safety design criteria into the design of the facility. The engineering safety features proposed by the applicant for use at this facility include:

- construction of secondary containment areas surrounding each of the hazardous materials storage areas designed to contain accidental releases that might happen during storage or delivery;
- physical separation of stored chemicals in isolated containment areas separated by a noncombustible partition in order to prevent accidental mixing of incompatible materials which may result in the evolution and release of toxic gases or fumes;
- installation of automatic sprinkler systems and an exhaust system for indoor hazardous materials storage areas;
- construction of a concrete secondary containment area surrounding the aqueous ammonia storage tank with a sloped floor that will drain any liquid into a covered sump;
- construction of a bermed containment area surrounding the truck unloading area with a sloped floor draining into the spill vault under the storage tank;
- process monitoring systems including continuous tank level monitors, temperature and pressure monitors, alarms, check valves, and emergency block valves.

Administrative Controls

Administrative controls also help prevent accidents and releases (spills) from moving off-site and impacting the community by establishing worker training programs, process safety management programs and by complying with all applicable health and safety LORS.

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

- worker training regarding chemical hazards, health and safety issues, and hazard communication;
- procedures to ensure the proper use of personal protective equipment;
- safety operating procedures for operation and maintenance of systems utilizing hazardous materials;
- fire safety and prevention; and

- emergency response actions including facility evacuation, hazardous material spill cleanup, and fire prevention.

At the facility, the project owner will be required to designate an individual who has the responsibility and authority to ensure a safe and healthful workplace. The project health and safety official will oversee the health and safety program and will have the authority to halt any action or modify any work practice in order to protect the workers, facility, and the surrounding community in the event that the health and safety program is violated.

The applicant will also prepare an RMP for aqueous ammonia as required by CalARP regulations and Condition of Certification **HAZ-2** that would include a program for prevention of accidental releases and responding to an accidental release of aqueous ammonia. A Hazardous Materials Business Plan will also be prepared by the applicant that would incorporate state requirements for the handling of hazardous materials (PEG 2006a, Section 15.15.3.2.1).

On-site Spill Response

In order to address the issue of spill response, the facility will prepare and implement an Emergency Response Plan which includes information on hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, prevention equipment and capabilities, etc. Emergency procedures will be established that include evacuation, spill cleanup, hazard prevention, and emergency response.

The Fresno County Fire Protection Division Hazardous Materials Response Unit stationed at the Mendota Station No. 96 located at 101 McCabe, Mendota, is considered the first responder for hazardous materials incidents. Their estimated response time is approximately 15-20 minutes. The emergency response team from the City of Fresno is the closest full hazardous materials response team. In the unlikely event a full hazardous materials response team is needed the response time would be about one hour to respond. (Mendez 2007, pers. comm.)

Additionally, designated power plant personnel will be assigned to a hazardous material response team and receive first responder training and hazardous materials technical training. (PEC 2006a, Section 5.15.3.2.1).

Staff concludes that the hazardous materials response time is acceptable and that the Fresno County Fire Protection Division has adequately trained and equipped personnel to respond effectively to a hazmat incident at the proposed facility.

Transportation of Hazardous Materials

Hazardous materials, including aqueous ammonia, sulfuric acid, and cleaning chemicals, will be transported to the facility via tanker truck. While many types of hazardous materials will be transported to the site, staff believes that transport of aqueous ammonia poses the predominant risk associated with hazardous materials transport.

Staff reviewed the applicant's proposed transportation route for hazardous materials delivery from Interstate-5 to West Panoche Road (PEC 2006a).

Ammonia can be released during a transportation accident and the extent of impact in the event of such a release would depend on the location of the accident and on the rate of dispersion of ammonia vapor from the surface of the aqueous ammonia pool. The likelihood of an accidental release during transport is dependent on three factors:

- the skill of the tanker truck driver,
- the type of vehicle used for transport, and
- accident rates along similar roads.

To address this concern, staff evaluated the risk of an accidental transportation release in the project area. Staff's analysis focused on the project area after the delivery vehicle leaves the main highway (Interstate 5). Consistent with CEQA, staff believes that it is appropriate to rely on the extensive regulatory program that applies to shipment of hazardous materials on California highways to ensure safe handling in general transportation (see the Federal Hazardous Materials Transportation Law 49 USC §5101 et seq., the US Department of Transportation Regulations 49 CFR Subpart H, §172-700, and California DMV Regulations on Hazardous Cargo). These regulations also address the issue of driver competence. See AFC section 8.10 for additional information on regulations governing the transportation of hazardous materials.

To address the issue of tanker truck safety, aqueous ammonia will be delivered to the proposed facility in U.S. DOT certified vehicles with design capacity of 6,500 gallons. These vehicles will be designed to U.S. DOT Code MC-306 or MC-307. These are high integrity vehicles designed for hauling of caustic materials such as aqueous ammonia.

Staff has, therefore, proposed Condition of Certification **HAZ-6** to ensure that regardless of which vendor supplies the aqueous ammonia, delivery will be made in a tanker, which meets or exceeds the specifications described by these regulations.

To address the issue of accident rates, staff reviewed the technical and scientific literature on hazardous materials transportation (including tanker trucks) accident rates in the United States and California. Staff relied on six references and three federal government databases to assess the risks of a hazardous materials transportation accident.

Staff used the data from the Davies and Lees (1992) article which references the 1990 Harwood et al. study, to determine that the frequency of release for transportation of hazardous materials in the U.S. is between 0.06 and 0.19 releases per million miles traveled on well designed roads and highways. The maximum usage of aqueous ammonia each year of operation of the proposed PEC will require up to 30 tanker truck deliveries of aqueous ammonia per year each delivering about 6,500 gallons. Each tanker truck delivery will travel approximately 2 miles from Interstate-5 to the facility on local roads.

This would result in about 60 miles of delivery tanker truck travel in the project area per year (with a full load). Staff believes that the risk over this distance is insignificant. Data

from the U.S. DOT show that the actual risk of a fatality over the past five years from all modes of hazardous material transportation (rail, air, boat, and truck) is approximately 0.1 in one million per mile.

In addition, staff calculated the risk of an accident associated with aqueous ammonia delivery from the freeway to the facility. Results show the risk of a significant spill to be 0.20 in one million for one trip and a risk of 12 in a million per year for 30 deliveries. This risk was calculated using accident rates on various types of roads (urban, one lane and two-lane) with distances traveled on each type of road computed separately. This is an extremely conservative model that does not include the low probability of many other factors such as dispersion of released material that affect the risk of impact. However, even these conservative results show the risk of a transportation impacts are insignificant.

Staff therefore believes the risk of public exposure to significant concentrations of aqueous ammonia during transportation to the facility are insignificant because of the remote possibility of accidental release of a sufficient quantity to present a danger to the public combined with the already diluted concentration of the aqueous ammonia being transported. The transportation of similar volumes of hazardous materials on the nation's highways is not unique nor an infrequent occurrence. Staff's analysis of the transportation of aqueous ammonia to the proposed facility (along with data from the U.S. DOT) demonstrates that the risk of accident and exposure is less than significant.

Based on the environmental mobility, toxicity, quantities present at the site and frequency of delivery, it is staff's opinion that aqueous ammonia poses the predominate risk associated with hazardous materials transportation and use at the proposed facility due to its relative potential for higher exposure as compared to the other materials. Because the risks associated with ammonia are insignificant, and the risks associated with other materials are even lower, staff concludes that the risk associated with transportation of other hazardous materials to the proposed facility are also insignificant.

Seismic Issues

The possibility exists that an earthquake would cause the failure of a hazardous materials storage tank. The quake could also cause the failure of the secondary containment system (berms and dikes) as well as electrically controlled valves and pumps. The failure of all these preventive control measures might then result in a vapor cloud of hazardous materials moving off-site and impacting the residents and workers in the surrounding community. The effects of the Loma Prieta earthquake of 1989, the Northridge earthquake of 1994, and the earthquake in Kobe, Japan in January 1995, heighten the concern regarding earthquake safety.

Information obtained after the January 1994 Northridge earthquake showed that some damage was caused to several large storage tanks and smaller tanks associated with the water treatment system of a cogeneration facility. Those tanks with the greatest damage, including seam leakage, were older tanks, while the newer tanks sustained displacements and failures of attached lines. Therefore, staff conducted an analysis of the codes and standards that should be followed in adequately designing and building storage tanks and containment areas to withstand a large earthquake. Staff also

reviewed the impacts of the February 2001 Nisqually earthquake near Olympia, Washington, a state with similar seismic design codes as California. No hazardous materials storage tanks were impacted by this quake. Referring to the sections on **Geologic Resources and Hazards** and **Facility Design** in the AFC, staff notes that the proposed facility will be designed and constructed to the applicable standards of the 2001 California Building Code and the 1997 Uniform Building Code. The site is within Seismic Zone 4 (PEC 2006a, section 5.3.1.1.8). Therefore, on the basis of what occurred in Northridge with older tanks and the lack of failures during the Nisqually earthquake with newer tanks designed to standards similar to those in California, staff determined that tank failures at the project site during seismic events are not probable and do not represent a significant risk to the public.

Site Security

This facility proposes to use hazardous materials that have been identified by the US Environmental Protection Agency (EPA) as materials where special site security measures should be developed and implemented to ensure that unauthorized access is prevented. The EPA published a Chemical Accident Prevention Alert regarding Site Security (EPA 2000a), the U.S. Department of Justice published a special report on Chemical Facility Vulnerability Assessment Methodology (US DOJ 2002), the North American Electric Reliability Council published Security Guidelines for the Electricity Sector in 2002 (NERC 2002), and the U.S. Department of Energy published a draft Vulnerability Assessment methodology for Electric Power Infrastructure in 2002 (DOE 2002). The energy generation sector is one of the 14 areas of Critical Infrastructure listed by the U.S. Department of Homeland Security.

In order to ensure that this facility or a shipment of hazardous material is not the target of unauthorized access, staff's proposed Conditions of Certification **HAZ-8** and **HAZ-9** address both a Construction Security Plan and an Operations Security Plan. These plans would require the implementation of Site Security measures consistent with the above-referenced documents and Energy Commission guidelines.

The goal of these conditions of certification is to provide for the minimum level of security for power plants to protect California's electrical infrastructure from malicious mischief, vandalism, or domestic/foreign terrorist attacks. The level of security needed for this power plant is dependent upon the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of consequences of that event. The results of the off-site consequence analysis prepared as part of the RMP will be used, in part, to determine the severity of consequences of a catastrophic event. In order to determine the level of security, the Energy Commission staff will provide guidance in the form of a vulnerability assessment (VA) decision matrix modeled after the U.S. Department of Justice Chemical Vulnerability Assessment Methodology (July 2002), the NERC 2002 guidelines, and the U.S. Department of Energy VAM-CF model. Basic site security measures shall be required at all locations in order to protect the infrastructure and electrical power generation within the state.

These measures will include perimeter fencing and detectors, possibly guards, alarms, site access procedures for employees and vendors, site personnel background checks, and law enforcement contact in the event of security breach. Site access for vendors

shall be strictly controlled. Consistent with current state and federal regulations governing the transport of hazardous materials, hazardous materials vendors will have to maintain their transport vehicle fleet and employ only drivers properly licensed and trained. The project owner will be required, through the use of contractual language with vendors, to ensure that vendors supplying hazardous materials strictly adhere to the U.S. DOT requirements for Hazardous Materials vendors to prepare and implement security plans as per 49 CFR 172.800 and to ensure that all hazardous materials drivers are in compliance with personnel background security checks as per 49 CFR Part 1572, Subparts A and B. The Compliance Project Manager (CPM) may authorize modifications to these measures, or may require additional measures in response to additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electric Reliability Council, after consultation with appropriate law enforcement agencies and the applicant.

CUMULATIVE IMPACTS AND MITIGATION

Staff reviewed the potential for the operation of the PEC combined with existing facilities to result in cumulative impacts on the population within the area. Staff determined that the chemical with the most potential to cause a cumulative impact is aqueous ammonia. However, it is expected that with the mitigation measures proposed by applicant and staff's suggested conditions of certification, there will be very little possibility for significant off-site air-borne concentration of ammonia gas and accordingly even less possibility for there to be simultaneous off-site plumes from the proposed facility and other power plants or other facilities handling hazardous materials with similarly low accidental release risks.

The applicant will develop and implement a hazardous materials handling program for the PEC project independent of any other projects considered for potential cumulative impacts. Staff believes that the facility, as proposed by the applicant and with the additional mitigation measures proposed by staff, poses a minimal risk of accidental release that could result in offsite impacts. It is unlikely that an accidental release that has very low probability of occurrence (about one in one million per year) would independently occur at the PEC site and another of the co-located facilities at the same time. Therefore, staff concludes that the facility would not contribute to a significant cumulative impact.

COMPLIANCE WITH LORS

Staff concludes that construction and operation of the PEC as proposed by the applicant and conditioned by staff, would be in compliance with all applicable LORS concerning long-term and short-term project impacts in the area of Hazardous Materials Management.

CONCLUSIONS

Staff's evaluation of the proposed project (with proposed mitigation measures) indicates that hazardous materials use will pose no significant impacts on the public. Staff's analysis also shows that there will be no significant cumulative impact. With adoption of the proposed conditions of certification, the proposed project will comply with all

applicable LORS. In response to Health and Safety Code, section 25531 et seq., the applicant will be required to develop an RMP. To insure adequacy of the RMP, staff's proposed conditions of certification require that the RMP be submitted for concurrent review by U.S. EPA and Energy Commission staff. In addition, staff's proposed conditions of certification require Fresno County Department of Community Health, Environmental Health Division's review and comment, and staff's review and approval, of the RMP prior to delivery of any hazardous materials to the facility. Other proposed conditions of certification address the issue of the transportation, storage, and use of aqueous ammonia.

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. If all mitigation proposed by the applicant and by staff are required, the use, storage, and transportation of hazardous materials will not present a significant risk to the public.

Staff proposes nine conditions of certification mentioned throughout the text (above) and listed below. **HAZ-1** ensures that no hazardous material would be used at the facility except those listed in the AFC, unless there is prior approval by the Fresno County Department of Community Health, Environmental Health Division and the Energy Commission Compliance Project Manager (CPM). **HAZ-2** requires that an RMP be prepared and submitted prior to the delivery of aqueous ammonia.

Staff believes that an accidental release of aqueous ammonia during transfer from the delivery tanker to the storage tank is the most probable accident scenario, and therefore proposes a condition **HAZ-3**, requiring development of a safety management plan for the delivery of aqueous ammonia. The development of a Safety Management Plan addressing delivery of ammonia will further reduce the risk of any accidental release not addressed by the proposed spill prevention mitigation measures and the required RMP. **HAZ-4** requires that the aqueous ammonia storage tank be designed to comply with applicable LORS. **HAZ-5** addresses the storage of sulfuric acid, and the transportation of hazardous materials is addressed in **HAZ-6** and **7**. Site security during both the construction and operations phases is addressed in **HAZ-8** and **HAZ-9.**

PROPOSED CONDITIONS OF CERTIFICATION

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

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

HAZ-2 The project owner shall concurrently provide a Business Plan and a Risk Management Plan (RMP) to the Certified Unified Program Authority (CUPA) (Fresno County Department of Community Health, Environmental Health Division) and the CPM for review at the time the RMP is first submitted

to the U.S. Environmental Protection Agency (EPA). After receiving comments from the CUPA, the EPA, and the CPM, the project owner shall reflect all recommendations in the final documents. Copies of the final Business Plan and RMP shall then be provided to the CUPA and EPA for information and to the CPM for approval.

Verification: At least 60 days prior to receiving any hazardous material on the site for commissioning or operations, the project owner shall provide a copy of a final Business Plan to the CPM for approval. At least sixty (60) days prior to delivery of aqueous ammonia to the site, the project owner shall provide the final RMP to the CUPA for information and to the CPM for approval.

HAZ-3 The project owner shall develop and implement a Safety Management Plan for delivery of aqueous ammonia. The plan shall include procedures, protective equipment requirements, training and a delivery procedures checklist. It shall also include a section describing all measures to be implemented to prevent mixing of aqueous ammonia with incompatible hazardous materials.

Verification: At least sixty (60) days prior to the first delivery of aqueous ammonia to the facility, the project owner shall provide a safety management plan as described above to the CPM for review and approval.

HAZ-4 The aqueous ammonia storage facility shall be designed to either the ASME Pressure Vessel Code and ANSI K61.6 or to API 620. In either case, the storage tank shall be protected by a secondary containment basin capable of holding 125% of the storage volume or the storage volume plus the volume associated with 24 hours of rain assuming the 25-year storm. The final design drawings and specifications for the ammonia storage tank and secondary containment basins shall be submitted to the CPM for review and approval.

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

HAZ-5 The project owner shall ensure that no flammable material is stored within 50 feet of the sulfuric acid tank.

Verification: At least sixty (60) days prior to the first receipt of sulfuric acid on-site, the project owner shall provide copies of the facility design drawings showing the location of the sulfuric acid storage tank and the location of any tanks, drums, or piping containing any flammable materials to the CPM.

HAZ-6 The project owner shall direct all vendors delivering aqueous ammonia to the site to use only tanker truck transport vehicles that meet or exceed the specifications of U.S. DOT Code MC-307.

Verification: At least sixty (60) days prior to the first receipt of aqueous ammonia on site, the project owner shall submit copies of the notification letter to

supply vendors indicating the transport vehicle specifications to the CPM for review and approval.

HAZ-7 The project owner shall direct all vendors delivering any hazardous material to the site to use only the route approved by the CPM (from Interstate-710, west along Bandini Boulevard, south on Downey Street, west on Fruitland Avenue, then south on Boyle Avenue to the PEC plant site). The project owner shall submit any desired change to the approved delivery route to the CPM for review and approval.

Verification: At least sixty (60) days prior to receipt of any hazardous materials on site, the project owner shall submit copies of the required transportation route limitation direction to the CPM for review and approval.

HAZ-8 At least 30 days prior to commencing construction, a site-specific Construction Site Security Plan for the construction phase shall be prepared and submittted to the CPM for review and approval. The Construction Security Plan shall include the following:

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

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

HAZ-9 In order to determine the level of security appropriate for this power plant, the project owner shall prepare a Vulnerability Assessment and submit that assessment as part of the Operations Security Plan to the CPM for review and approval. The Vulnerability Assessment shall be prepared according to guidelines issued by the North American Electrical Reliability Council (NERC 2002), the U.S. Department of Energy (DOE 2002), and the U.S. Department of Justice Chemical Vulnerability Assessment Methodology (July 2002). Physical site security shall be consistent with the guidelines issued by the NERC (Version 1.0, June 14, 2002) and the DOE (2002) and will also be based, in part, on the use, storage, and quantity of hazardous materials present at the facility.

The project owner shall also prepare a site-specific Security Plan for the operational phase and shall submit it to the CPM for review and approval. The project owner shall implement site security measures addressing physical site security and hazardous materials storage. The level of security to be implemented will be determined by the results of the Vulnerability Assessment but in no case shall the level of security be less than that described as below (as per NERC 2002).

The Operation Security Plan shall include the following:

1. Permanent full perimeter fence or wall, at least 8 feet high;

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

3. Evacuation procedures;

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

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

6. Site personnel background checks, including employee and routine on-site contractors [Site personnel background checks are limited to ascertaining that the employee's claims of identity and employment history are accurate. All site personnel background checks shall be consistent with state and federal law regarding security and privacy];

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

8. Requirements for Hazardous Materials vendors to prepare and implement security plans as per 49 CFR 172.800 and to ensure that all hazardous materials drivers are in compliance with personnel background security checks as per 49 CFR Part 1572, Subparts A and B;

9. Closed Circuit TV (CCTV) monitoring system, recordable, and viewable in the power plant control room and security station (if separate from the control room) capable of viewing, at a minimum, the main entrance gate and the ammonia storage tank; and

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

    A. Security guards present 24 hours per day, 7 days per week. or

B. Power plant personnel on-site 24 hours per day, 7 days per week and all of the following:

1. The CCTV monitoring system required in number 9 above shall include cameras that are able to pan, tilt, and zoom (PTZ), have low-light capability, are recordable, and are able to view 100% of the perimeter fence, the ammonia storage tank, the outside entrance to the control room, and the front gate from a monitor in the power plant control room; and

2. Perimeter breach detectors or on-site motion detectors

The project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to the security plant components (e.g., transformers, gas lines, compressors, etc.) depending on circumstances unique to the facility or in response to industry-related standards, security concerns, or additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Council, after consultation with appropriate law enforcement agencies and the applicant.

Verification: At least 30 days prior to the initial receipt of hazardous materials on-site, the project owner shall submit a site-specific Vulnerability Assessment and Operations Site Security Plan are available to the CPM for review and approval.

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Hazardous Materials
Appendix A

Basis for Staff's Use of 75 PPM Ammonia Exposure Criteria

October 2006

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

Staff uses a health-based airborne concentration of 75 PPM as a threshold for initiating the evaluation of risk of exposure associated with potential accidental releases of ammonia. While this level is not consistent with the 150-ppm level used by EPA and Cal/EPA in evaluating such releases pursuant to the Federal Risk Management Program and State Accidental Release Program, it is appropriate for use in staff's analysis of the proposed project. The Federal Risk Management Program and the State Accidental Release Program are administrative programs designed to address emergency planning and ensure that appropriate safety management practices and actions are implemented in response to accidental releases. However, the regulations implementing these programs do not provide clear authority to require design changes or other major changes to a proposed facility. The preface to the Emergency Response Planning Guidelines (ERPGs) states that "these values have been derived as planning and emergency response guidelines, **not** exposure guidelines, they do not contain the safety factors normally incorporated into exposure guidelines. Instead they are estimates, by the committee, of the thresholds above which there would be an unacceptable likelihood of observing the defined effects." It is staff's contention that these values apply to healthy adult individuals and are levels that should not be used to evaluate the acceptability of avoidable exposures for the entire population. While these guidelines are useful in decision making in the event that a release has already occurred (for example, prioritizing evacuations), they are not appropriate for and are not binding on discretionary decisions involving proposed facilities where many options for mitigation are feasible. CEQA requires permitting agencies making discretionary decisions to identify and mitigate potentially significant impacts through feasible changes or alternatives to the proposed project.

Staff has chosen to use the National Research Council's 30-minute Short Term Public Emergency Limit (STPEL) for ammonia to determine the potential for significant impact. This limit is designed to apply to accidental unanticipated releases and subsequent public exposure. Exposure at this level should not result in serious effects but would result in "strong odor, lacrimation, and irritation of the upper respiratory tract (nose and throat), but no incapacitation or prevention of self-rescue." It is staff's opinion that exposures to concentrations above these levels pose significant risk of adverse health impacts on sensitive members of the general public. It is also staff's position that these exposure limits are the best available criteria to use in gauging the significance of public exposures associated with potential accidental releases. It is, further, staff's opinion that these limits constitute an appropriate balance between public protection and mitigation of unlikely events, and are useful in focusing mitigation efforts on those release scenarios that pose real potential for serious impacts on the public. Table 1 provides a comparison of the intended use and limitations associated with each of the various criteria that staff considered in arriving at

the decision to use the 75-ppm STPEL. **Hazardous Materials Appendix B** provides a summary of adverse effects, which might be expected to occur at various airborne concentrations of ammonia.

Hazardous Materials 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[1]	NRC	Most members of general population	50 ppm 75 ppm 100 ppm	60 min. 30 min. 10 min.	Significant irritation but protects nearly all segments of general population from irreversible acute or late effects. One time accidental exposure.
TWA[2]	NIOSH	Adult healthy male workers	25 ppm	8 hr.	No toxicity or irritation on continuous exposure for repeated 8 hr. shifts
ERPG-2[5]	AIHA	Applicable only to emergency response planning for the general population (evacuation) (not intended as exposure criteria) (see preface attached)	150 ppm	60 min.	Exposures above this level entail** unacceptable risk of irreversible effects in healthy adult members of the general population (no safety margin)

1) (EPA 1987) 2) (NIOSH 1994) 3) (NRC 1985) 4) (NRC 1972) 5) (AIHA 1989)
* The (NRC 1979), (WHO 1986), and (Henderson and Haggard 1943) all conclude that available data confirm the direct relationship to increases in effect with both increased exposure and increased exposure duration.
** The (NRC 1979) describes a study involving young animals, which suggests greater sensitivity to acute exposure in young animals. The (WHO 1986) warns that the young, elderly, asthmatics, those with bronchitis and those that exercise should also be considered at increased risk based on their demonstrated greater susceptibility to other non-specific irritants.

REFERENCES FOR HAZARDOUS MATERIALS APPENDIX A, TABLE 1

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ABBREVIATIONS FOR HAZARDOUS MATERIALS APPENDIX A, TABLE 1

ACGIH, American
Conference of Governmental
and Industrial Hygienists
AIHA, American Industrial
Hygienists Association
EEGL, Emergency Exposure Guidance Level
EPA, Environmental Protection Agency
ERPG, Emergency Response Planning Guidelines
IDLH, Immediately Dangerous to Life and Health Level
NIOSH, National Institute of Occupational Safety and Health
NRC, National Research Council
STEL, Short Term Exposure Limit
STPEL, Short Term Public Emergency Limit
TLV, Threshold Limit Value
TWA, Time-Weighted Average
WHO, World Health Organization

HAZARDOUS MATERIALS
APPENDIX B

Summary of Adverse Health Effects of Ammonia

SUMMARY OF ADVERSE HEALTH EFFECTS OF AMMONIA'

638 PPM
WITHIN SECONDS:

- Significant adverse health effects;
- Might interfere with capability to self rescue;
- Reversible effects such as severe eye, nose and throat irritation.

AFTER 30 MINUTES:

- Persistent nose and throat irritation even after exposure stopped;
- irreversible or long-lasting effects possible: lung injury;
- Sensitive people such as the elderly, infants, and those with breathing problems (asthma) experience difficulty in breathing;
- Asthmatics will experience a worsening of their condition and a decrease in breathing ability, which might impair their ability to move out of area.

266 PPM
WITHIN SECONDS:

- Adverse health effects;
- Very strong odor of ammonia;
- Reversible moderate eye, nose and throat irritation.

AFTER 30 MINUTES:

- Some decrease in breathing ability but doubtful that any effect would persist after exposure stopped;
- Sensitive persons: experience difficulty in breathing;
- Asthmatics: may have a worsening condition and decreased breathing ability, which might impair their ability to move out of the area.

' Source: Alvin Greenberg, Ph.D., QEP

64 PPM
WITHIN SECONDS:

- Most people would notice a strong odor;
- Tearing of the eyes would occur;
- Odor would be very noticeable and uncomfortable;
- Sensitive people could experience more irritation but it would be unlikely that breathing would be impaired to the point of interfering with capability of self rescue;
- Mild eye, nose, or throat irritation;
- Eye, ear, & throat irritation in sensitive people;
- Asthmatics might have breathing difficulties but would not impair capability of self rescue.

22 or 27 PPM
WITHIN SECONDS:

- Most people would notice an odor;
- No tearing of the eyes would occur;
- Odor might be uncomfortable for some;
- Sensitive people may experience some irritation but ability to leave area would not be impaired;
- Slight irritation after 10 minutes in some people.

4.0, 2.2, *or 1.6 PPM*

- No adverse effects would be expected to occur;
- Doubtful that anyone would notice any ammonia (odor threshold 5 - 20 PPM);
- Some people might experience irritation after 1 hr.

Hazardous Materials
Appendix C
Proposed On-site Inventory of Hazardous Materials

TABLE 5.15-1
HAZARDOUS MATERIALS AND WASTES USAGE AND STORAGE DURING CONSTRUCTION

Material	Purpose	Usage/Day	Max Stored	Storage Type
Acetylene	Welding	As needed	270 cf	Cylinder
Argon	Welding	As needed	270 cf	Cylinder
Diesel fuel oil	Emergency generator	As needed	2,000 gal	Tank, UL C.S.
Lubricating oil	Lubricating equipment parts	As needed		Drum
Oxygen — gaseous	Welding operation	As needed	275 cf	Cylinder
Paint	Painting	25 gallons	100 gal	Can
Sodium hydroxide	Spill neutralization	As needed	2 gal	Carboy

1 All numbers are approximate. cf = cubic feet or gal = gallon(s)

TABLE 5.15-2
HAZARDOUS MATERIALS AND WASTES USAGE AND STORAGE DURING OPERATIONS

Material	Purpose	Usage/Day	Max Stored	Storage Type
Acetylene	Welding	As needed	270 cf	Cylinder
Aqueous ammonia ([19%] NH4 (OH))	NOx emissions control	300 lbs/day	20,000 gal	Aboveground tank
Acid (Sulfuric or HCL)	Cooling tower pH control		5,000 gal	Aboveground tank
Argon	Welding	As needed	270 cf	Cylinder
Cleaning Chemicals Detergents and	Miscellaneous cleaning	As needed	20 gal	Manufacturer containers
Diesel Fuel Oil	Emergency generator	As needed	2,000 gal	Tank
Dispertant	Prevent particulate settlement on cooling tower basin deposit	As needed	200 gal	Aboveground container
Hydraulic Oil	Power transmission medium in hydraulically operated equipment	As needed	500 gal	55-gallon drums
Laboratory Reagents	Miscellaneous lab work	As needed	20 gal liquid, 100 lbs solid	Manufacturers containers
Lubricating Oil	Bearing and sleeves lubrication	As needed	24,000	Lubricating sumps of turbines and 55-gallon drums
Mineral Transformer Insulating Oil	Provides overheating and insulation protection for transformers	As needed	60,000 gal	Transformers
Nitrogen	Transformers	As needed	275 cf	Cylinder
Scale/Corrosion Inhibitor	Prevent scale and corrosion in tower circulation water lines cooling	As needed	200 gal	Aboveground container
Sodium hypochlorite	Biocide for condenser cooling water system water treatment	As needed	5,000 gal	Aboveground storage tank, plastic
Sulfuric acid for station	Electrical/ctrl. Bldg., Combustion turbine, miscellaneous	As needed	100 gal	Battery

1 All numbers are approximate. cf = cubic feet or gal = gallon(s).

LAND USE

Amanda Stennick

SUMMARY OF CONCLUSIONS

Staff cannot conclude that the Panoche Energy Center (PEC) is consistent with the Fresno County General Plan Agriculture and Land Use Element because power plants are not expressly listed as a permitted or conditional use under that designation and Fresno County has not provided sufficient information that would demonstrate how the PEC is substantially similar in character and intensity to such uses listed in Table LU-3. Staff also cannot conclude the PEC is consistent with the AE-20 zoning designation because power plants are not expressly listed as a permitted or conditional use in that zone and Fresno County has not provided complete information in its Site Plan Review (SPR) analysis to determine whether the project would be consistent with the intent and purpose of the AE-20 zone.

Staff used the California Agricultural Land Evaluation and Site Assessment (LESA) model to assess the loss of 22.2 acres of prime agricultural land (12.8-acre project site, 8 acres laydown area (temporary), and 2.2-acre PG&E substation expansion) and concluded the PEC's impact to agriculture to be significant. To mitigate for the loss of prime farmland, condition of certification **LAND-1** requires the applicant to pay a fee to an agricultural land trust to purchase 15 acres of prime farmland. With staff's recommended conditions of certification, the potential significant adverse environmental impacts of the PEC will be mitigated to a level below significance pursuant to the California Environmental Quality Act (CEQA).

INTRODUCTION

The land use analysis of the PEC Application for Certification (06-AFC-5) focuses on the project's consistency with land use plans, ordinances, and policies, and the project's compatibility with existing and planned land uses. In this case the land use analysis also focuses on the project's consistency with the Williamson Act. In general, a power plant and its related facilities have the potential to create land use impacts if they create unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts. These individual resource areas are discussed in separate sections of this document. A power plant would also create a significant impact if it converts prime or unique farmland or farmland of statewide importance to non-agricultural uses.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following table contains all applicable land use laws, ordinances, regulations, and standards.

LAND USE Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	The proposed project is not located on federally administered lands and is not subject to federal land use regulations.
State	Subdivision Map Act (Pub. Resources Code § 66410-66499.58),§ 66412.1. Section 66412.1 of the Subdivision Map Act exempts a project from state subdivision requirements provided that the project demonstrates compliance with local ordinances regulating design and improvements. California Land Conservation Act (Gov. Code § 51200-51297.4) Section 51282 addresses Williamson Act Contract cancellation procedures. In order for a contract to be cancelled, the local elected officials (e.g. a City Council or a County Board of Supervisors) need to make a series of findings and approve the cancellation.
Local	Fresno County would require an unclassified conditional use permit for the proposed project in the A-E 20 Zone, but for the exclusive siting authority of the Energy Commission.

SETTING

The applicant proposes to build the PEC on a 12.8-acre portion of a 128-acre parcel in the northwestern section of the Westside Valley Area in Fresno County. The closest community to the project is Mendota, located 16 miles to the east and northeast of the proposed PEC. The site is located southeast of the intersection of West Panoche Road and Davidson Avenue, about 2 miles east of Interstate 5, and 14 miles west of Highway 33. Primary access to the site is from West Panoche Road via Interstate 5 or Hwy 33.

PROJECT SITE AND VICINITY

The 12.8-acre project site was formerly a portion of a 128-acre parcel within Fresno County Agricultural Preserve No. 367, the remainder of which is still under a Williamson Act contract. In April 2007, the Fresno County Board of Supervisors approved the request for cancellation of the 12.8-acre site from the Williamson Act contract.

The proposed project would be located in an area of large agricultural parcels that are also under Williamson Act contracts. The Assessors Parcel Number (APN) for the 128-acre parcel is 027-060-78S. The project site is designated Agriculture by the Fresno County General Plan Agriculture and Land Use Element; the zoning designation is AE-20 (Exclusive Agriculture with a 20-acre minimum parcel size). The site is currently planted in pomegranates, as is the adjacent eight-acre laydown area.

The zoning and general plan land use designations within one mile of the subject parcel are AE-20 and Agriculture, respectively. The project site and most of the surrounding area are mapped Prime Farmland by the California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP). **Land Use Figure 1** shows the general plan designations and **Land Use Figure 2** shows the zoning for the site and within one mile of the site. Other than agriculture, farm residences, and related buildings, land uses in the immediate vicinity of the proposed project include the PG&E Panoche Substation, the CalPeak Peaker Plant, and the Wellhead Power Generation facility.

As stated in the AFC and the PEC substation expansion letter (docketed May 7, 2007), there is limited land within the existing PG&E Panoche Substation so PG&E will expand the substation (located on APN 027-060-61SU) to interconnect to the PEC site. A lot line adjustment will be filed by PG&E to accommodate the expansion. All substation expansion work will be performed by PG&E. The expansion would total 96,000 square feet, or about 2.2 acres. The conversion of this 2.2 acres to a nonagricultural use is discussed under the heading **CONVERSION OF PRIME FARMLAND**. Other offsite improvements required by the PEC would include 2,400 linear feet of gas pipeline and a 300-foot transmission line to tie into the PG&E Panoche Substation.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Significance criteria are based on the CEQA Guidelines and on performance standards or thresholds adopted by responsible agencies. An impact may be considered significant if the project results in:

- conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect;
- disruption or division of the physical arrangement of the established community;
- conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps pursuant to the Farmland Mapping and Monitoring Program of the California Department of Conservation (i.e., a department within the California Resources Agency), to non-agricultural uses;
- conflict with existing zoning for agricultural use, or a Williamson Act Contract;
- involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to nonagricultural use;
- unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts, or when it precludes or unduly restricts existing or planned future uses.

COMPLIANCE WITH LORS

Subdivision Map Act (Pub. Resources Code § 66410-66499.58)

The Subdivision Map Act provides procedures and requirements regulating land divisions and the determination of parcel legality. Regulation and control of the design and improvement of subdivisions by the Map Act have been vested in the legislative bodies of local government. Section 66412.1 of the Subdivision Map Act exempts a project from state subdivision requirements provided that the project demonstrates compliance with local ordinances regulating design and improvements. The project's compliance with local development standards is discussed under the heading **Fresno County Zoning Ordinance**.

California Land Conservation Act (Gov. Code § 51200-51297.4)

The California Land Conservation Act, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space uses. The landowner commits the parcel to an annually renewing ten-year period wherein no conversion out of agricultural use is permitted. In return, the land is taxed at a rate based on the actual use of the land for agricultural purposes, as opposed to its unrestricted market value. Participation in the Williamson Act program is dependent on county adoption and implementation of the program. Property owner participation in the program is voluntary.

The proposed 12.8-acre project site was a portion of a 128-acre parcel within Fresno County Agricultural Preserve No. 367 that is under a Williamson Act Contract. The applicant filed a request with Fresno County for cancellation of the 12.8 acres from the Williamson Act Contract and on April 24, 2007, the Fresno County Board of Supervisors approved the request. Fresno County staff in its Agricultural Land Conservation Committee Staff Report Agenda Item No. 3, April, 4, 2007 recommended approval of the cancellation to the Board of Supervisors (see **Land Use Appendix 1** for the full text). In accordance with Government Code section 51282, the Fresno County Board of Supervisors made the following findings to approve the cancellation from Agricultural Preserve No. 367.

1. That the cancellation is for land on which a notice of contract nonrenewal has been filed.

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

3. That cancellation is for an alternative use which is consistent with applicable provisions of the city or county general plan.

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

5. That there is no proximate (i.e. nearby) noncontracted land which is both available and suitable for the proposed use.

As part of its staff report, Fresno County had to address Finding no. 2, which asks whether the cancellation "is not likely to result in the removal of adjacent lands from agricultural use." In its response, Fresno County did not state that the cancellation of the 12.8 acres would require the cancellation of an additional 2.2 acres to accommodate the expansion of the PG&E Panoche Substation. Staff discusses the removal of the adjacent 2.2 acres from agricultural use under the heading **CONVERSION OF PRIME FARMLAND**.

The Board's approval action and the findings are necessary to conclude that the cancellation of the Williamson Act contract has lawfully occurred, thereby permitting the power generation facility to be considered for this site. In addition to the Board's approval, cancellation requires the issuance of a Final Certificate of Cancellation of the Williamson Act contract. According to Fresno County staff, the Final Certificate of Cancellation will be recorded when the following conditions of approval for the cancellation have been met.

1. Payment in full of the cancellation fee.

2. Unless the cancellation fee is paid or a Certificate of Cancellation of Contract is issued within one year from the date of the recording of this certificate, the cancellation fee shall be recomputed as of the date of notice by the landowner to the Board of Supervisors required by Government Code Section 51283.4.

3. The landowner shall obtain all permits necessary to commence this project.

As shown by condition no. 3, the Certificate of Cancellation of Contract will not be recorded until all permits, including the Energy Commission's license are issued. Please refer to **Land Use APPENDIX 2** for a copy of the Board of Supervisors' Resolution #07-203 and the Certificate of Tentative Cancellation. Interested parties would have up to 180 days to challenge the final cancellation.

Fresno County General Plan

The Fresno County General Plan, adopted in 2000, contains an evaluation of existing conditions and provides long-term goals and policies to guide growth and development in the county for the next 15 to 25 years. The general plan is implemented by the county through its zoning, subdivision ordinances, specific plans, growth management policies, planned development districts, development agreements, development review, code enforcement, land use database, capital improvement programs, environmental review procedures, building and housing codes, and redevelopment plans. The general plan land use designation for the site is Agriculture.

Fresno County General Plan **Goal LU-A** states that the county shall promote the long-term conservation of productive and potentially productive agricultural lands and to accommodate agricultural-support services and agriculturally-related activities that support the viability of agriculture and further the county's economic development goals.

The applicable land use policies from Fresno County's General Plan Agriculture and Land Use Element are given below. *Staff's discussion is given in italics after each policy.*

Policy LU-A.1. The county shall maintain agriculturally-designated areas for agriculture use and shall direct urban growth away from valuable agricultural lands to cities, unincorporated communities, and other areas planned for such development where public facilities and infrastructure are available.

The proposed project would be sited on a parcel that is was formerly under a Williamson Act Contract in an area dominated by large agricultural parcels also in the Williamson Act. The proposed use is not an agricultural use nor is it considered an ancillary agricultural use because to function it does not need to locate adjacent to an agricultural use. On that basis, the project could be considered a use that would be more compatible in an area *where industrially zoned land is available and where adjacent land uses are similar in character and intensity.*

Policy LU-A.3. The county may allow by discretionary permit in areas designated Agriculture, special agricultural uses and agriculturally related activities including value-added processing facilities, and certain non-agricultural uses listed in Table LU-3 (see **LAND USE Appendix 3** for the full text). Approval of these and similar uses in areas designated Agriculture shall be subject to the following criteria:

- The use shall provide a needed service to the surrounding agricultural area which cannot be provided more efficiently within urban areas or which requires location in a non-urban area because of unusual site requirements or operational characteristics;
- The use should not be sited on productive agricultural lands if less productive land is available in the vicinity;
- The operational or physical characteristics of the use shall not have a detrimental impact on water resources or the use or management of surrounding properties within at least 1/4-mile radius; and
- A probable workforce should be located nearby or be readily available.

As stated in the AFC, the objectives of the PEC are to provide reliable service to PG&E's customer loads in the area, which would include agricultural as well as urban users. The PEC has specific site requirements (proximity to a substation and transmission lines) that would be provided by the adjacent PG&E substation. However, the PEC's operational characteristics (industrial nature of the project) do not require that the project locate in a non-urban area. Similar energy facilities have been sited in urban areas where the zoning and adjacent land uses are compatible with uses such as power plants.

The PEC would be located on productive agricultural lands in an area dominated by large agricultural parcels, also in agricultural production. In addition, the project site and most of the surrounding area within a one-mile radius are mapped Prime Farmland by the California Department of Conservation's Farmland Mapping and Monitoring Program. Because of the area's prime soils, less productive agricultural land in the vicinity of the proposed site is not available. The land use in the vicinity of the current proposed location that makes the site feasible is the adjacent PG&E substation, which would provide the necessary infrastructure that another site in the vicinity would not provide.

The **Water and Soil Resources** *section has concluded that with mitigation, the PEC would not significantly impact water resources on the site or impact the use or management of surrounding properties. The* **Socioeconomic Resources** *section of this document has concluded that a sizeable workforce is available in Fresno County and the surrounding region. Please refer to the sections on* **Water and Soil Resources** *and* **Socioeconomic Resources** *for a complete discussion on potential impacts and mitigation for water resources and construction workforce.*

Policy LU-A.13. The county shall protect agricultural operations from conflicts with nonagricultural uses by requiring buffers between proposed non-agricultural uses and adjacent agricultural operations.

No aerial spraying is done in this area that might necessitate a buffer between the proposed PEC and adjacent agricultural operations. Therefore, staff does not expect the PEC to preclude or negatively impact the continued agricultural use of the remainder of the parcel or that of the surrounding area.

Energy Commission Staff's General Plan Consistency Determination for the PEC

As part of the licensing process, the Energy Commission must determine whether a proposed facility complies with all applicable state, regional, and local LORS (Public Resources Code section 25523(d)(1)). The Energy Commission must either find that a project conforms to all applicable LORS or make specific findings that a project's approval is justified even where the project is not in conformity with all applicable LORS (Public Resources Code section 25525).

When determining LORS compliance, staff is permitted to rely on a local agency's assessment of whether a proposed project is consistent with that agency's zoning and general plan. On past projects staff has requested that the local agency provide a discussion of the findings and conditions that agency would make when determining whether a proposed project would comply with the agency's LORS, were they the permitting authority. Any conditions recommended by an agency are considered by Energy Commission staff for inclusion in the conditions of certification staff recommends for the project.

As part of staff's analysis of local LORS compliance and specifically to determine the County's view on the project's consistency with their general plan, staff reviewed Fresno County's Agricultural Land Conservation Committee Staff Report on the proposed Williamson Act cancellation. As stated in the section **California Land Conservation Act (Gov. Code § 51200-51297.4)**, one of the findings the Board of Supervisor's must make is whether the "cancellation is for an alternative use which is consistent with applicable provisions of the county general plan." In their staff report, Fresno County staff provided the following information.

> "The subject property is designated Agriculture in the Fresno County General Plan. The proposed alternate use of the property is development of a thermal power plant…Nevertheless, the County's General Plan allows for development of certain non-agricultural uses in areas designated for Agriculture.

> According to information provided by the applicant, the location of a power generation facility within an urban environment has the potential to impact sensitive receptors such as schools and hospitals in addition to greater land use conflicts with residences. Further, the applicant indicated that the site selection investigation that was performed looked for land that was in sufficient proximity to the infrastructure listed above [PG&E substation, natural gas lines, and transmission lines]. The applicant reported that no less productive agricultural lands were identified as a result of the site selection investigation. Based on the information provided by the applicant, staff believes that the proposed alternate use is consistent with the General Plan. Based on this information, this finding can be made."

Staff cannot conclude from Fresno County staff's report that it provided compelling evidence to recommend to the Board of Supervisors that the alternate use, in this case the PEC, is consistent with Fresno County's General Plan Agriculture and Land Use Element.

In the Fresno County General Plan Agriculture and Land Use Element, the Agriculture land use designation provides for the production of crops and livestock and for location of necessary agriculture commercial centers, agriculture processing facilities, and certain nonagricultural activities. Table LU-3 in the Fresno County General Plan Agriculture and Land Use Element lists uses allowed by right and by special permit in areas designated Agriculture. The special permit uses are agriculturally related and value added agricultural uses such as wineries, commercial packing, and processing of crops, or they are non-agricultural uses such as sewage treatment plants, cemeteries, radio and television broadcasting stations, and golf courses. The most closely related special permit uses comparable to a power generating facility in Table LU-3 would be "electrical substation" and "mineral extraction and oil and gas development."

On April 17, 2007 Energy Commission staff sent a letter to Fresno County requesting that the County provide a discussion of how a use such as a power plant would be consistent with the provisions and intent of the Agriculture land use designation and with the uses allowed by right or by special permit listed in Table LU-3 in the General Plan Agriculture and Land Use Element. Fresno County's response letter to the Energy Commission (docketed May 7, 2007) states that Fresno County staff did discuss with Energy Commission staff, the basis for Fresno County's conclusion that the proposed project is consistent with the County's General Plan. The letter also states that the Fresno County Board of Supervisors concurred with its staff and determined that the proposed use is consistent with the General Plan when they approved the petition for partial cancellation of the 12.8-acre site from the Williamson Act.

While Energy Commission staff does not disagree with Fresno County's letter, staff believes that Fresno County has not provided Energy Commission staff a discussion of how the proposed project is substantially similar in character and intensity to such uses listed Table LU-3 in the Fresno County General Plan Agriculture and Land Use Element that would warrant a determination of consistency. In addition, Fresno County has not, in its staff report for cancellation or in its response to Energy Commission staff's letter addressed the four criteria listed in its general plan Policy LU-A.3, which is the

mechanism that enables the county to allow through a discretionary permit, the non-agricultural uses listed in Table LU-3 in areas designated Agriculture.

Therefore, Energy Commission staff cannot conclude that the PEC would be consistent with the Fresno County General Plan Agricultural and Land Use Element.

Fresno County Zoning Ordinance

Site Plan Review Section 874 of Fresno County's Ordinance Code

To assess conformity with the exemption provision of the Subdivision Map Act, Fresno County and Energy Commission staffs required the applicant to submit a site plan to Fresno County and complete the County's SPR process (Section 874 of Fresno County's Ordinance Code). Section 874 states that, "The purpose of the site plan is to enable the Director to make a finding that the proposed development is in conformity with the intent and provisions of this Division and to guide the Development Services Division in the issuance of permits." The County is aware that their SPR is advisory and their actions in this matter represent a review of the project that the County would normally undergo but for the Energy Commission's exclusive jurisdiction and permit authority.

The applicant submitted its site plan to Fresno County on January 26, 2007. Fresno County submitted its SPR analysis to the Energy Commission (docketed April 10, 2007). In its SPR process, Fresno County determined that as conditioned, the proposed PEC would be in conformity with the development standards for the AE-20 zone. In addition to zoning development standards, the SPR addresses and conditions the project in the areas of visual resources, drainage and flood control, health, waste, hazardous waste, facility design, socioeconomic resources, worker safety and fire protection, air quality, and traffic and transportation.

Staff reviewed Fresno County's SPR and determined that as conditioned, the PEC would meet the development standards of the AE-20 zone. However, Fresno County provided no information in its SPR that addressed whether the project is in conformity with the intent and provisions of the AE-20 zoning district. **Land Use Table 2** shows the development standards and staff's consistency determination for the PEC. Fresno County's proposed conditions of approval have been analyzed by Energy Commission staff and incorporated as **LAND-2**.

LAND USE Table 2
Development Standards and Consistency Determination for PEC

Development Standards for the AE-20 Zone. Zoning Ordinance Sections 816.5	Consistency Determination
Lot Size: Each lot size shall have a minimum acreage as indicated by the district acreage designation. The minimum lot size in the AE-20 zone is 20 acres.	Consistent as proposed. The proposed site would total 12.8 acres. Because the parcel would be created through a lease, it would not be subject to the 20-acre parcel size (Tani 2007).
Building Height: Non-dwelling structures and other accessory farm buildings are excepted from building height restrictions.	Consistent as proposed. Four 90-foot turbine stacks are proposed for the PEC. However, Fresno County does not limit the height of non-dwelling structures in the AE-20 zone.

Setbacks: Each lot shall have a front yard of not less than 35 feet extending across the full width of the lot; each lot shall have a side yard on each side of not less than 20 feet.	Consistent as proposed. The applicant's site plan shows that the footprint of the PEC is outside the 35-foot front yard and 20-foot side yard setbacks. Therefore, the project meets Fresno County's setback requirements.
Parking: The number of parking spaces required is 1 space for every 2 permanent employees, 1 space for each salesperson, and 1 space for each company vehicle.	Consistent as proposed. For the project to conform to this standard a minimum of 6 parking spaces would have to be provided. The applicant's site plan shows 8 parking spaces.
Off-Site Improvements: The project owner shall ensure that any access gate shall be setback a minimum of 20 feet (or the length of the longest vehicle to initially enter the site from the edge of the ultimate road right-of-way).	Consistent with implementation of a Condition of Certification. For the project to conform to this standard the site plan would need to show that any access gate shall be setback a minimum of 20 feet (or the length of the longest vehicle to initially enter the site from the edge of the ultimate road right-of-way. Staff's proposed Condition of Certification **LAND-2** would require the project owner to conform to this off-site improvement.

AE-20 Zoning District, Section 816 of the Fresno County Ordinance Code

The PEC site is zoned AE-20. The AE-20 District "is intended to be an exclusive district for agriculture and those uses which are necessary and an integral part of the agricultural operation. This district is intended to protect the general welfare of the agricultural community from encroachments of non-related agricultural uses which by their nature would be injurious to the physical and economic well-being of the agricultural district." Section 816 lists the uses permitted, the uses permitted subject to director review and approval, the uses permitted subject to a conditional use permit, uses expressly prohibited, and the property development standards. Staff's review of the uses for this zone shows that power plants are not expressly listed as a permitted or conditional use. Therefore, similar to the discussion of the project's consistency with the Fresno County General Plan land use designation, staff cannot conclude that the proposed project would be consistent with the AE-20 zoning because power plants are not expressly listed in any of the use categories of this zone and because Fresno County's SPR analysis did not address whether the project would be consistent with the intent and purpose of the AE-20 zone designation.

According to Fresno County staff, each zone district in Fresno County has a list of uses allowed by right and uses allowed through a discretionary permit such as a Director Review and Approval, or a Conditional Use Permit, which may be classified or unclassified (Tani 2006). The AFC states that Fresno County would ordinarily require an unclassified conditional use permit for a use such as the PEC (PEC 2006a). Listed below are the findings Fresno County would have to make for an unclassified conditional use permit were it the permitting authority.

- That the site of the proposed use is adequate in size and shape to accommodate the use including all yards, spaces, walls, fences, parking, loading, landscaping, and other features required by the use.
- That the site for the proposed use relates to streets and highways adequate in width and pavement type to carry the quantity and kind of traffic generated by the proposed use.
- That the proposed use will have no adverse effect on abutting property and surrounding neighborhood or the permitted use thereof.
- That the proposed use is consistent with the Fresno County General Plan.

Based on Fresno County's SPR analysis of the proposed project, Energy Commission staff cannot conclude that the SPR satisfies Fresno County's unclassified use permit process. An SPR normally, but for the Energy Commission's exclusive jurisdiction merely ensures the project's compliance with the development standards in the AE-20 zone. For these reasons and those discussed above, staff cannot conclude that the PEC would be consistent with the AE-20 zone designation.

DISRUPT OR DIVIDE AN ESTABLISHED COMMUNITY

While the proposed project is located in an area dominated by agriculture, there are three existing energy uses within one-half mile of the proposed PEC: the Wellhead Peaker Plant; the CalPeak Peaker Plant; and the PG&E Substation. The two peaker plants (both under 50 MW) were approved by Fresno County within the last few years. Another proposed energy facility, the Starwood Midway Energy Project (06-AFC-7) is currently under Energy Commission review and would be located north of the existing electrical generating uses and PG&E Substation on the same 128-acre parcel as the PEC. Given the existing cluster of energy/industrial uses, development of the proposed site as an energy/industrial use would continue the trend toward industrial development in the immediate area. Because of the established pattern of energy/industrial uses, the proposed project would not result in a physical division or disruption of the established agricultural community. No new physical barriers would be created by the project and no existing roadways or pathways would be blocked that would be considered detrimental to agricultural use.

CONVERSION OF PRIME FARMLAND

The 12.8-acre project site and 8-acre laydown area consist of prime, irrigated soils planted in a mature pomegranate orchard. According to section 5.4 of the AFC, the project site has been irrigated for many years. The 8-acre laydown area will be replanted in pomegranates after project construction. Therefore, staff does not consider the temporary use of this acreage for a laydown area to be a significant impact to agriculture.

State CEQA Guidelines Appendix G provides direction to lead agencies when determining whether impacts to agricultural resources are significant environmental effects. Appendix G states that lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment (LESA) model prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. The LESA model provides an approach for rating the relative quality of land resources based upon specific measurable features. The California LESA model is composed of six different factors: two Land Evaluation factors based upon measures of soil resource quality; and four Site Assessment factors that provide measures of a given project's size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands.

Staff used the LESA model to determine whether the project's conversion of the 12.8 acres would be significant. Because staff considers the conversion of the 2.2 acres for the Panoche Substation expansion an indirect impact of the project, staff included that acreage in its LESA analysis. Staff determined the final LESA score to be 84.5 points

(see **Land Use Appendix 4**). Under the California LESA scoring threshold a score between 80 and 100 points is significant.

When staff identifies a significant impact, staff's analysis needs to discuss how that impact would affect the environmental justice population (**Socioeconomics Figure 1**) within the project's six-mile radius. The direct and indirect impacts of project construction would be that 15 acres of agricultural land would be converted to a nonagricultural use. When agricultural land is converted, the effect can be experienced by the residents of the area as a loss of open space, a loss of farmland, and the encroachment of urban uses into a nonurban setting.

Another effect of the loss of 15 acres of prime farmland would be an economic one for those who are directly and indirectly employed in the farming sector of the area's economy. Because CEQA considers the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural uses a significant impact requiring mitigation, staff proposes a similar condition of certification that was used on other Energy Commission siting projects (Tesla, Salton Sea, East Altamont) where agricultural land was converted to nonagricultural uses. Condition of Certification **LAND-1** requires the project owner to mitigate for the loss of 15 acres of prime farmland at a one-to-one ratio. Staff believes that with the adoption of this condition, the impact to farmland will be reduced to less than significant and any impact to the environmental justice population would be mitigated because there would be no net loss of productive agricultural land within Fresno County.

LAND USE COMPATIBILITY

Energy Commission staff has found no unmitigated impacts in the areas of **Noise, Air Quality, Public Health**, **Traffic and Transportation**, and **Visual Resources.** Because the PEC would create no unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts the project would be compatible with surrounding land uses. As discussed earlier, no aerial spraying is done in this area that might necessitate a buffer between the proposed PEC and adjacent agricultural operations. Therefore, staff does not expect the PEC to preclude or negatively impact the continued agricultural use of the remainder of the parcel or that of the surrounding area.

CUMULATIVE IMPACTS AND MITIGATION

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. (Cal. Code Regs., tit. 14, section 15130.)

The PEC is planned to serve the region's existing and anticipated electrical needs. Staff does not expect the PEC to make a significant contribution to regional impacts related to new development and growth.

Both the PEC and Starwood Midway projects would be situated in an area dominated by large agricultural parcels under Williamson Act Contracts. Although the proposed Starwood Midway site is classified as having prime soils, for the past five years the site

has been used as a storage yard and for farm worker housing. Staff notes that although the Starwood site has not been used for recent crop production, it remained in a Williamson Act contract until April 2007.

Because the Starwood Midway site would be located in an area dominated by agricultural use, staff used the LESA model to determine whether it would have a significant land use impact. Staff's analysis showed that the Starwood Midway project also would have a significant impact on agricultural resources. To mitigate this impact, in the Starwood Midway PSA, staff proposes a condition of certification similar to **LAND-1** in this PSA. Therefore, with mitigation, there will be no net loss of agricultural land in Fresno County as a result of the PEC and the Starwood Midway projects and no cumulative significant impact to land use from conversion of agricultural land to nonagricultural uses.

In addition to the two proposed energy projects, existing land uses in the immediate vicinity (other than agriculture, farm residences, and related buildings), include the PG&E Panoche Substation, the CalPeak Peaker Plant, and the Wellhead Power Generation facility. The CalPeak Peaker Plant and the Wellhead Power Generation facility were permitted by Fresno County within the last few years. Because the proposed project is situated near other nonagricultural industrial/energy uses, it would not result in a physical division or disruption of the established agricultural community, no new physical barriers would be created by the project, and no existing roadways or pathways would be blocked that would be detrimental to agricultural uses.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

The Department of Conservation (DOC) submitted a letter to the Energy Commission (docketed on September 28, 2006) commenting on the proposed PEC's AFC. The DOC concluded that "…prior to any activity related to placing the PEC on the subject contracted parcel, the involved contract must be terminated by nonrenewal or cancellation for the portion of land involving the plant and access road…"

Staff concurs with the DOC's September 28, 2006 letter.

The DOC submitted a letter (dated January 19, 2007) to Fresno County (docketed on February 23, 2007) commenting on the partial cancellation of Land Conservation (Williamson Act) Contract No. 367; APN 027-060-78S. The DOC concluded that assuming the information the applicant provided on the cancellation application is accurate and correct, the DOC concurs that the Fresno County Board of Supervisors has a basis to find cancellation of the 12.82-acre portion of the contract consistent with the purposes of the Williamson Act, that development of the proposed power generation facility will not negatively affect adjacent agricultural lands or cause their removal from agricultural use, that the proposed alternative use appears consistent with the agricultural land use policies in the Fresno County General Plan, and due to the location of the existing PG&E substation, will not produce discontiguous patterns of urban development. Overall, the DOC letter concurs that there is not proximate or noncontracted land that is suitable or available for the proposed PEC.

Staff has insufficient information for reaching an agreement with the DOC's conclusions about the project's consistency with Fresno County's General Plan land use policies. Also, the DOC's letter does not address the direct loss of prime farmland. Staff's analysis concluded that the conversion of this farmland to a non-agricultural use would result in a significant impact requiring mitigation. Therefore, staff proposes condition of certification **LAND-1**, which would require the project owner to mitigate for the loss of prime farmland at a one-to-one ratio. Staff believes that with the adoption of this condition, the impact to farmland will be reduced to less than significant.

Fresno County submitted to the Energy Commission their Agricultural Land Conservation Committee Staff Report Agenda Item No. 3, April, 4, 2007 on the proposed Williamson Act cancellation for the 12.8 acres of prime farmland (see **Land Use Appendix 2** for the full text). In its staff report, Fresno County makes a recommendation of approval to the Board of Supervisors for the cancellation of the 12.8 acres.

Staff has insufficient information for concurrence with Fresno County's conclusions that support its statement that "…the cancellation is for an alternative use that is consistent with the provisions of the County General Plan." The County, in its staff report recognizes that its "…General Plan allows for development of certain non-agricultural uses in areas designated for Agriculture." However, staff believes the County does not provide an adequate discussion of the proposed power plant's consistency with the provisions and intent of the Agriculture land use designation or provide a discussion as to how the County allows for such nonagricultural uses as a power plant in areas designated Agriculture.

Fresno County's May 2, 2007 letter (docketed May 7, 2007) to Energy Commission staff is discussed under the section **Fresno County General Plan**.

CONCLUSIONS

Energy Commission staff cannot conclude that the PEC complies with all applicable LORS. The following conclusions summarize staff's analysis.

- **Fresno County General Plan Agriculture and Land Use Element** – staff cannot conclude that the PEC is consistent with the Agriculture land use designation because power plants are not expressly listed as a permitted or conditional use under that designation and Fresno County has not provided sufficient information that would demonstrate how the PEC is substantially similar in character and intensity to such uses listed Table LU-3.
- **Fresno County Zoning Ordinance** - staff cannot conclude that the PEC is consistent with the AE-20 zoning designation because power plants are not expressly listed as a permitted or conditional use in that zone and Fresno County has not provided sufficient information in its SPR analysis to determine whether the project would be consistent with the intent and purpose of the AE-20 zone.
- **Williamson Act** – Fresno County's 180-day appeal period for the cancellation would begin once the County issues the Tentative Certificate of Cancellation. In the most recent siting case (Tesla) the Commission certified the project while the appeal

period was still in effect. In the Tesla case as in the PEC, Alameda County conditioned its tentative approval of the cancellation upon Commission certification of the project.

- **Subdivision Map Act –** staff is satisfied that the applicant's submittal of its site plan to Fresno County for the county's SPR complies with the exemption provision of the Subdivision Map Act.

Because staff's analysis can arguably show how the proposed project does not conform to the Fresno County General Plan Agriculture and Land Use Element and is not consistent with the AE-20 zone designation, staff suggests that the applicant work with Fresno County to resolve the issue of conformity prior to the publication of the Final Staff Assessment (FSA). In seeking resolution of local LORS, the applicant may want to ask Fresno County to address the four items from Policy LU-A.3 in the Fresno County Agriculture and Land Use Element and the four findings required for granting an unclassified conditional use permit in the AE-20 zone.

Policy LU-A.3 in the Fresno County Agriculture and Land Use Element

- The use shall provide a needed service to the surrounding agricultural area which cannot be provided more efficiently within urban areas or which requires location in a non-urban area because of unusual site requirements or operational characteristics;
- The use should not be sited on productive agricultural lands if less productive land is available in the vicinity;
- The operational or physical characteristics of the use shall not have a detrimental impact on water resources or the use or management of surrounding properties within at least 1/4-mile radius; and
- A probable workforce should be located nearby or be readily available.

Findings required for granting an unclassified conditional use permit in the AE-20 zone.

- That the site of the proposed use is adequate in size and shape to accommodate the use including all yards, spaces, walls, fences, parking, loading, landscaping, and other features required by the use.
- That the site for the proposed use relates to streets and highways adequate in width and pavement type to carry the quantity and kind of traffic generated by the proposed use.
- That the proposed use will have no adverse effect on abutting property and surrounding neighborhood or the permitted use thereof.
- That the proposed use is consistent with the Fresno County General Plan.

Staff is satisfied that as conditioned, the proposed PEC would not have a significant adverse affect on the environmental justice population living within the project's six-mile radius. The project would convert 15 acres of prime soil to a non-agricultural use. Staff's proposed Condition of Certification **LAND-1** will reduce this impact to less than significant.

Should the Energy Commission certify the project, staff recommends that the Energy Commission adopt the following conditions of certification.

PROPOSED CONDITION OF CERTIFICATION

LAND-1 The project owner shall mitigate for the loss of 15 acres of prime farmland at a one-to-one ratio.

Verification: The project owner shall provide a mitigation fee payment to a Fresno County agricultural land trust or a statewide agricultural land trust at least 30 days prior to the start of construction. The fee payment will be determined by Fresno County and the project owner and set forth in a prepared Farmlands Mitigation Agreement (FMA), also determined between the project owner and Fresno County. The project owner shall provide a copy of the FMA to the Compliance Project Manager (CPM) for approval at the time of fee payment submittal. The FMA will require that 15 acres of prime farmland and/or easements shall be purchased within two years of start of construction as compensation for the 15 acres of prime farmland to be converted by the PEC. The FMA shall guarantee that the land managed by the trust will be located in Fresno County (if feasible) and will be farmed in perpetuity. The project owner shall provide to the CPM updates in the Annual Compliance Report on the status of farmland/easement purchase(s).

LAND-2 The project owner shall design and construct the project to the applicable development standards in Sections 816.5 and 843 of the Fresno County Ordinance Code.

1. Any access gate shall be setback a minimum of 20 feet (or the length of the longest vehicle to initially enter the site from the edge of the ultimate road right-of-way.

2. The number of parking spaces required as part of this project shall be one space for every permanent employee, one space for each sales person, and one space for each company vehicle for a total of 6 spaces.

3. Each lot shall have a front yard of not less than 35 feet extending across the full width of the lot; each lot shall have a side yard on each side of not less than 20 feet.

Verification: At least sixty (60) days prior to the start of construction the project owner shall submit to the Compliance Project Manager (CPM) written documentation including evidence of review by Fresno County that the project conforms to the standards in Sections 816.5 and 843 of the Fresno County Ordinance Code.

LAND-3 The project owner shall provide a copy of Fresno County's Final Certificate of Cancellation of Contract from Agriculture Preserve No. 367.

Verification: At least 60 days prior to construction, the project owner shall submit to the CPM a copy of Fresno County's Final Certificate of Cancellation of Contract from Agriculture Preserve No. 367.

REFERENCES

PEC (Panoche Energy Center Project) 2006a – Application for Certification. Submitted to the California Energy Commission on August 2, 2006.

California Dept of Conservation (CDOC) 2006a – Comments and Recommendations. Submitted to the California Energy Commission on September 28, 2006.

PEC (Panoche Energy Center Project) 2006e – Supplement to the Application for Certification. Submitted to the California Energy Commission on November 7, 2006.

PEC (Panoche Energy Center Project) 2006f – Petition for Partial Cancellation of Williamson Act Contract No. 367-APN-027-060-78s. Submitted to the California Energy Commission on December 1, 2006.

PEC (Panoche Energy Center Project) 2007a – Data Responses. Submitted to the California Energy Commission on January 9, 2007.

California Dept of Conservation (CDOC) 2007a – Tentative Approval of Land Conservation Contract Cancellation. Submitted to the California Energy Commission on February 23, 2007.

FRES (Fresno County) 2007a – Site Plan Review. Submitted to the California Energy Commission on April 10, 2007.

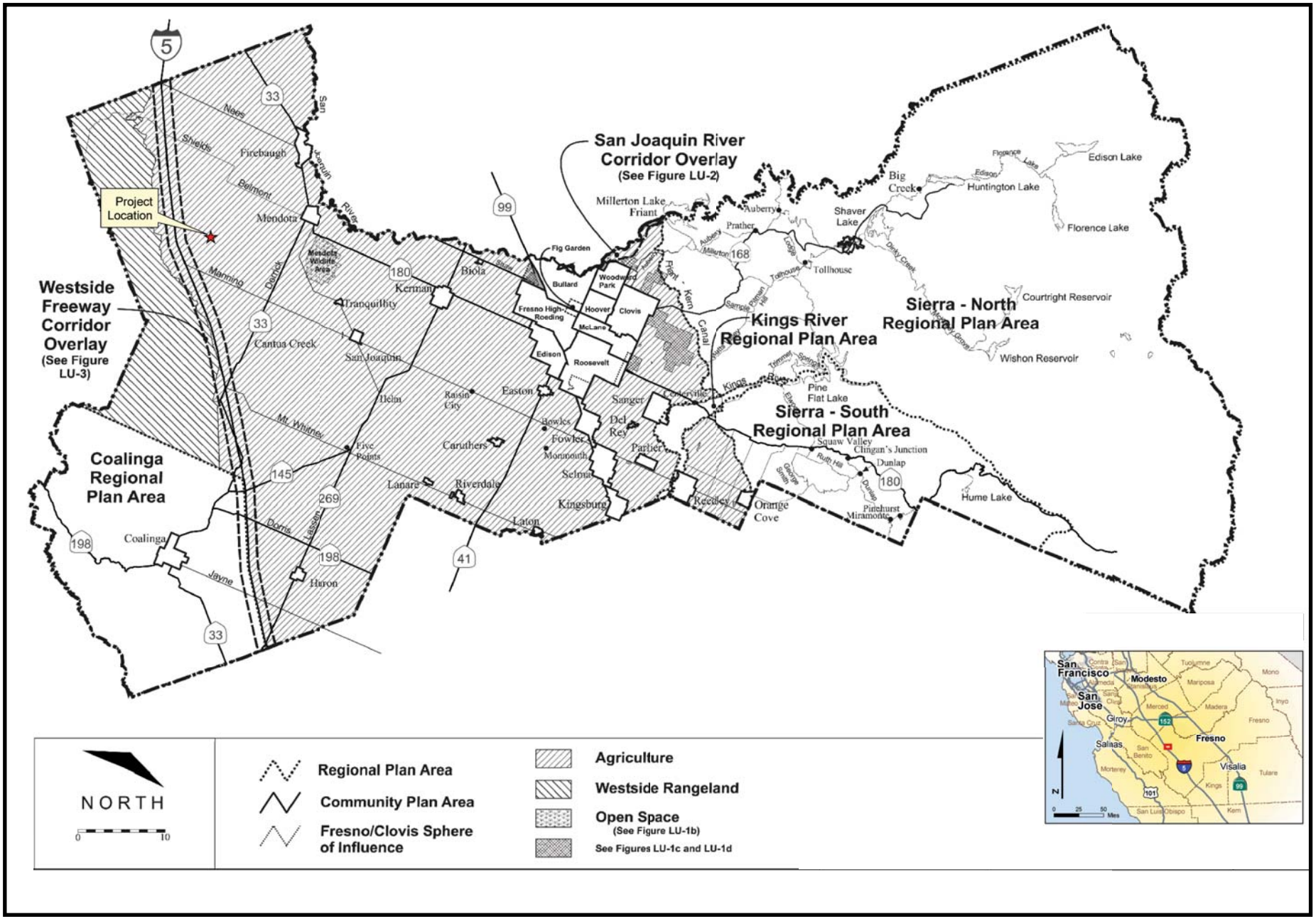
FRES (Fresno County) 2007b – Agricultural Land Conservation Committee Staff Report. Submitted to the California Energy Commission on May 1, 2007.

Tani, Robin. Senior Planner, Fresno County Planning Department. Personal communication with staff in December 2006.

Tani, Robin. Senior Planner, Fresno County Planning Department. Meeting with Amanda Stennick and David Jenkins in January 2007.

LAND USE - FIGURE 1

Panoche Energy Center - General Plan Designations

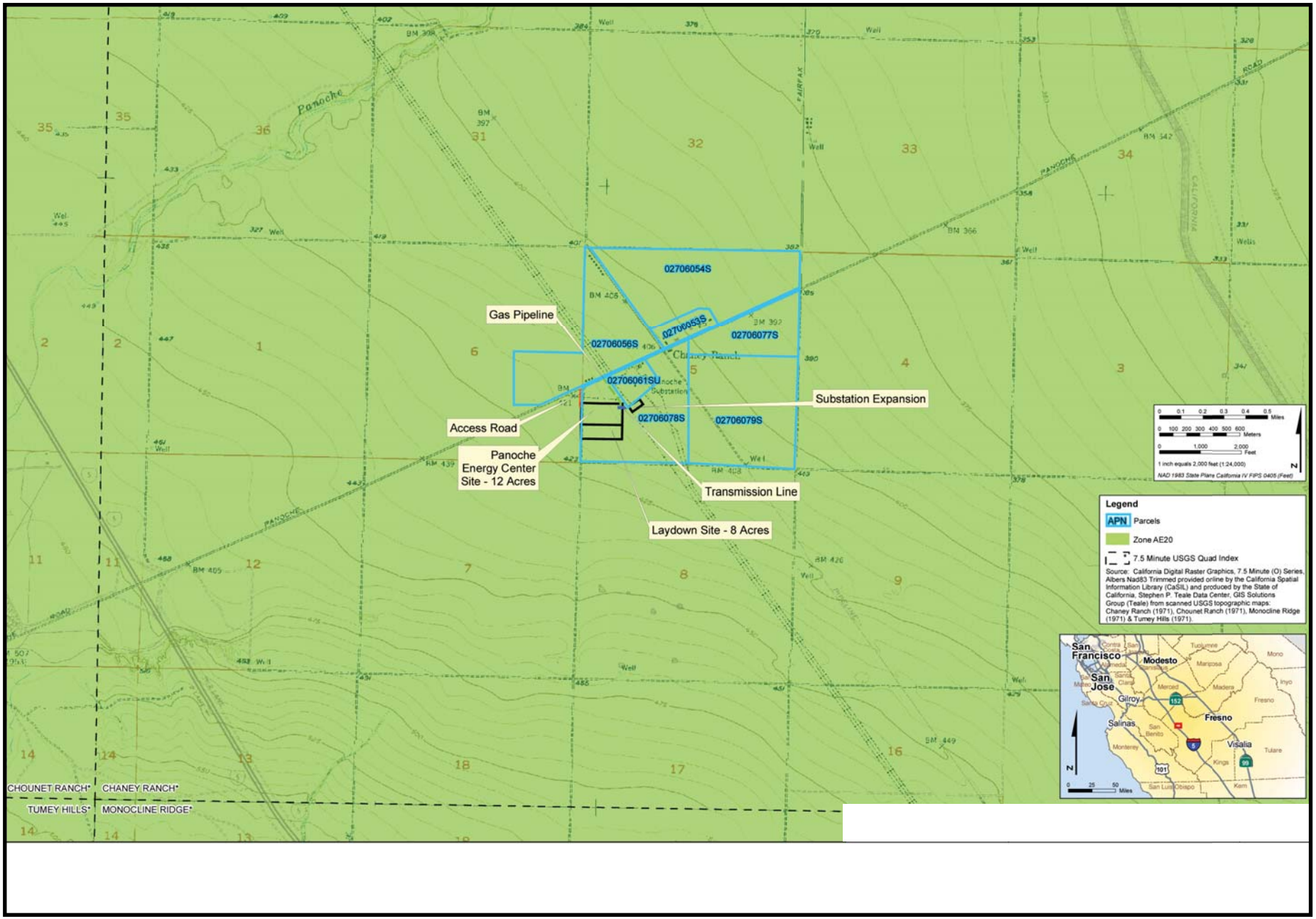


CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, FEBRUARY 2007

SOURCE: AFC Figure 5.9-1

LAND USE - FIGURE 2

Panoche Energy Center - Zoning Designations



CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, FEBRUARY 2007

SOURCE: AFC Figure 5.9-2

LAND USE APPENDIX 1

Panoche

County of Fresno

Department of Public Works and Planning
Alan Weaver, Director

DOCKET
06-AFC-5
DATE APR 0 4 2007
RECD. MAY 0 1 2007

Agricultural Land Conservation Committee Staff Report
Agenda Item No. 3
April 4, 2007

SUBJECT: **Review and make recommendation to forward to the Board of Supervisors regarding PARTIAL CANCELLATION of AGRICULTURAL LAND CONSERVATION CONTRACT NO. 367 (RLCC NO. 838)**

STAFF CONTACT: **Jared Nimer, Planner**
(559) 262-4846

Margie McHenry, Senior Planner
(559) 262-4870

RECOMMENDATION:

Staff believes that the required findings can be made and recommends that application for Partial Cancellation of Agricultural Land Conservation Contract No. 367 be forwarded to the Board of Supervisors with a recommendation for approval, subject to the following conditions:

1. Payment in full of the cancellation fee.
2. Unless the cancellation fee is paid or a Certificate of Cancellation of Contract is issued within one year from the date of the recording of this certificate, the cancellation fee shall be recomputed as of the date of notice by the landowner to the Board of Supervisors required by Government Code Section 51283.4.
3. The landowner shall obtain all permits necessary to commence the project.

BACKGROUND:

The Agricultural Land Conservation Committee reviews requests for Cancellation of Agricultural Land Conservation Contracts for consistency with the purposes of the Williamson Act, pursuant to Section 51282 of the Government Code. Action to approve or deny an application for contract Cancellation becomes a recommendation to the Board of Supervisors.

PAO Investments, LLC (Applicant) filed an application for Partial Cancellation of Agricultural Land Conservation Contract (ALCC) No. 367. The proposal seeks to remove 12.82 acres of prime agricultural land from Contract restrictions for development of a 200-megawatt thermal power plant. This application has been assigned RLCC No. 838.

The subject property is located on the south side of Panoche Road, between Interstate 5 and Fairfax Avenue, approximately 12.6 miles southwest of the City of Mendota. (See Location Map *Exhibit 'A'*, Zoning Map *Exhibit 'B'*, and Land Use Map *Exhibit 'C'*).

DISCUSSION:

In order to approve a cancellation request, the Board of Supervisors must determine that the action is consistent with the Land Conservation Act of 1965. The law requires that five findings be made. Staff analysis of the required findings is as follows:

1. *That the cancellation is for land on which Notice of Nonrenewal has been served pursuant to Section 51245 of the Government Code.*

   An executed Notice of Partial Nonrenewal for ALCC No. 367 was accepted by the County Recorder on November 6, 2006, and was assigned Document No. 2006-0236374. Nonrenewal was initiated on the entire 128 acres that comprise APN 027-060-78s.

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

   The subject property and adjacent parcels are currently devoted to agricultural uses, with the exception of the existing PG&E substation located on a separate parcel adjacent to the northeast of the area proposed for Williamson Act cancellation. The applicant has stated that the proposed location of the thermal power plant is ideal due to the existing infrastructure installed at the existing Pacific Gas & Electric substation and by the existing high-volume natural gas lines and 115 kilovolt transmission lines located on the subject parcel. Two power generation facilities already exist next to the PG&E substation. The existing infrastructure allows for efficient interconnection, which minimizes impacts, specifically environmental impacts.

   Staff agrees that the proposed use of the property for a thermal power plant would not cause any disruption to adjacent parcels and would not result in restrictions on the use of adjacent parcels. While it is possible that adjacent land may be removed from agricultural use, for development of additional power plants, this would be due to the clustering of the necessary infrastructure for efficient interconnection with existing facilities and resources rather than the development of the proposed thermal power plant.

3. *That the cancellation is for an alternative use that is consistent with the provisions of the County General Plan.*

   The subject property is designated Agriculture in the Fresno County General Plan. The proposed alternate use of the property is development of a thermal power plant. Permitting for this use is issued through the State of California, so no land use applications would be processed by the County of Fresno during development of the thermal power plant. Nevertheless, the County's General Plan allows for development of certain non-agricultural uses in areas designated for Agriculture.

   According to information provided by the applicant, the location of a power generation facility within an urban environment has the potential to impact sensitive receptors such as schools and hospitals in addition to greater land use conflicts with residences. Further, the applicant indicated that the site selection investigation that was performed looked for land that was in sufficient proximity to the infrastructure listed above. The

applicant reported that no less productive agricultural lands were identified as a result of the site selection investigation. Based on the information provided by the applicant, staff believes that the proposed alternate use is consistent with the General Plan. Based on this information, this finding can be made.

4. *That the cancellation will not result in discontiguous patterns of urban development.*

   The proposed use of the property for a thermal power plant would not be considered urban development. Based on this, staff believes this finding can be made.

5. *That there is no proximate non-contracted land which is both available and suitable for the use to which it is proposed that 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.*

   The applicant conducted an analysis of proximate non-contracted land, to determine if any non-contracted land was both available and suitable for the proposed alternate use. The applicant stated that in order to be suitable for development, of the proposed power plant would require that the land be in close proximity to the existing PG&E substation and to high-volume natural gas lines. Parcels within three miles of the subject property were examined by the applicant, but were all either subject to Williamson Act Contract or were too distant from the existing PG&E substation and/or high-volume natural gas lines to be considered feasible alternatives to the subject property.

ENVIRONMENTAL DETERMINATION:

It has been determined that the project proposal is considered statutorily exempt from CEQA, under Section 15271, Early Activities Related to Thermal Power Plants. A copy of the County's CEQA Determination memo is included as Exhibit 'D'.

OTHER REVIEWING AGENCIES:

As of January 1, 2001, Government Code Section 51284.1(a) requires notification to be provided by the County to the Director of the State Department of Conservation (the Director) once a cancellation application has been accepted as complete. Under Government Code Section 51284.1(c), the Director's comments are required to be considered by the Board of Supervisors before acting on the proposed cancellation. Pursuant to the Director's January 19, 2007, letter providing comments on the applicant's information related to the required findings, the Department of Conservation stated that the Board of Supervisors has a basis to find cancellation of the 12.82-acre portion of the Contract consistent with the purposes of the Williamson Act The Director's comments are attached as Exhibit E.

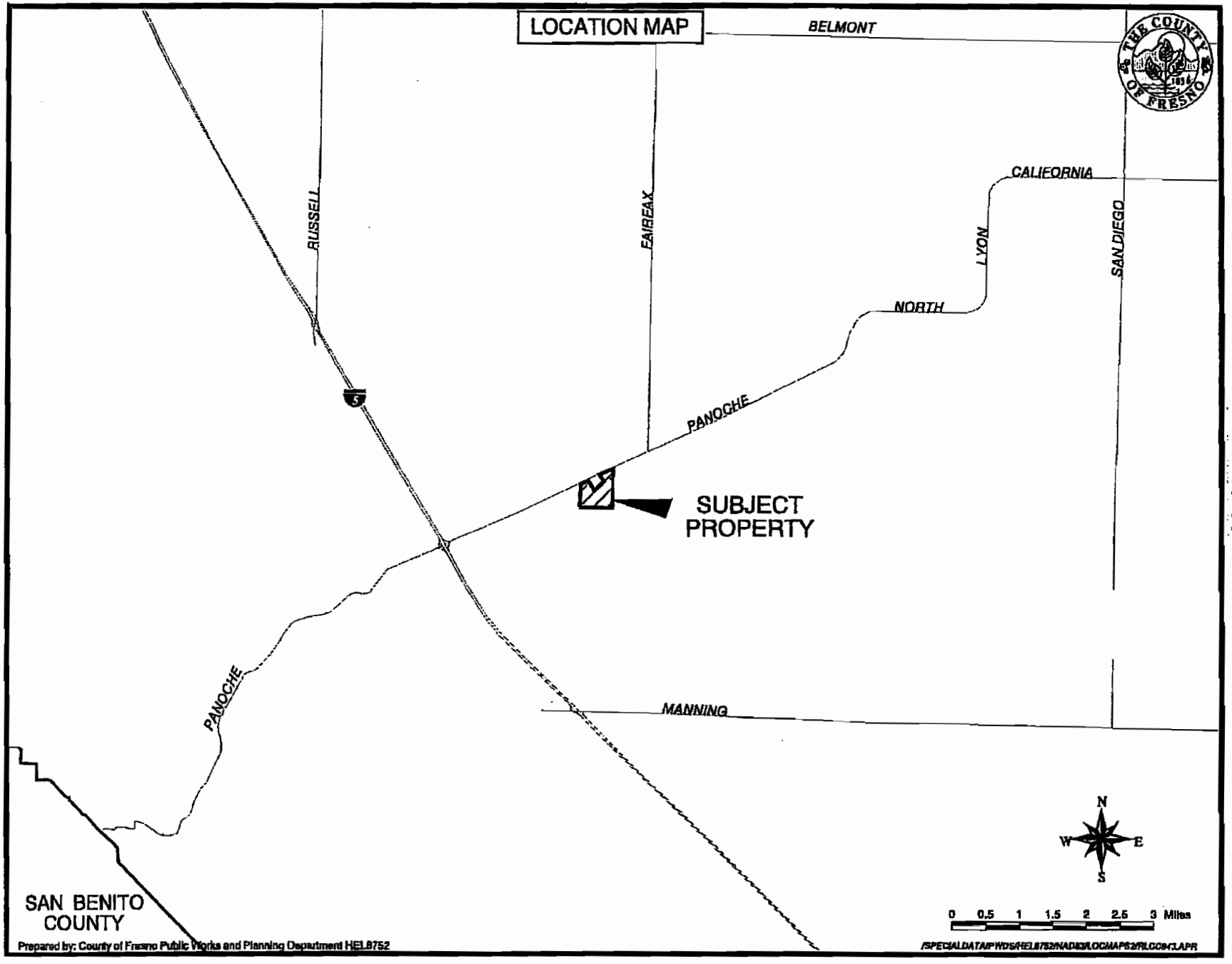

LOCATION MAP
BELMONT
CALIFORNIA
RUSSELL
FAIRFAX
LYON
SAN DIEGO
NORTH
PANOCHE
5
SUBJECT PROPERTY
PANOCHE
MANNING
SAN BENITO COUNTY
N
W
E
S
0 0.5 1 1.5 2 2.5 3 Miles
Prepared by: County of Fresno Public Works and Planning Department HEL8752

EXHIBIT 'A'

RLCC 838
STR: 06 - 15/13

EXISTING ZONING MAP

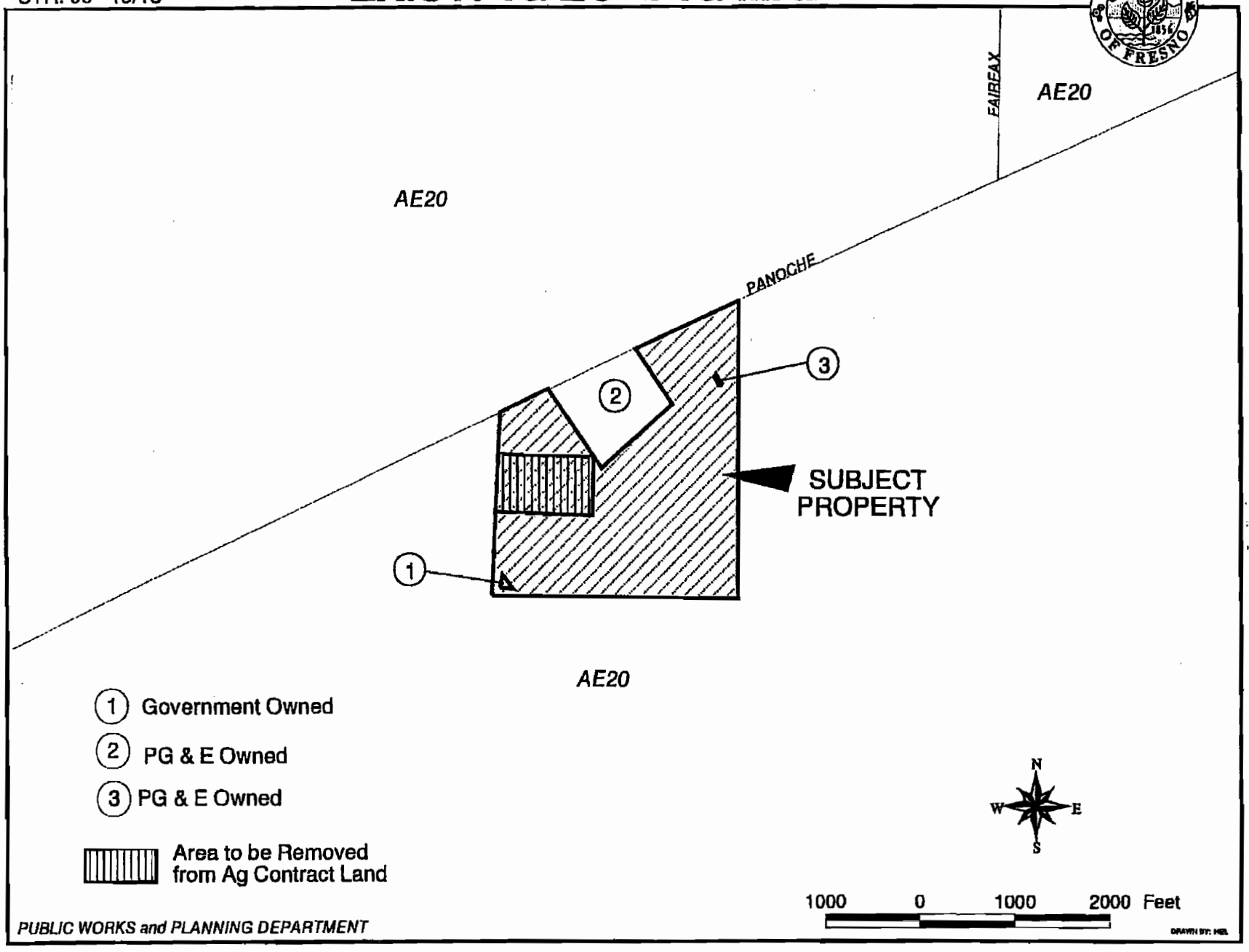
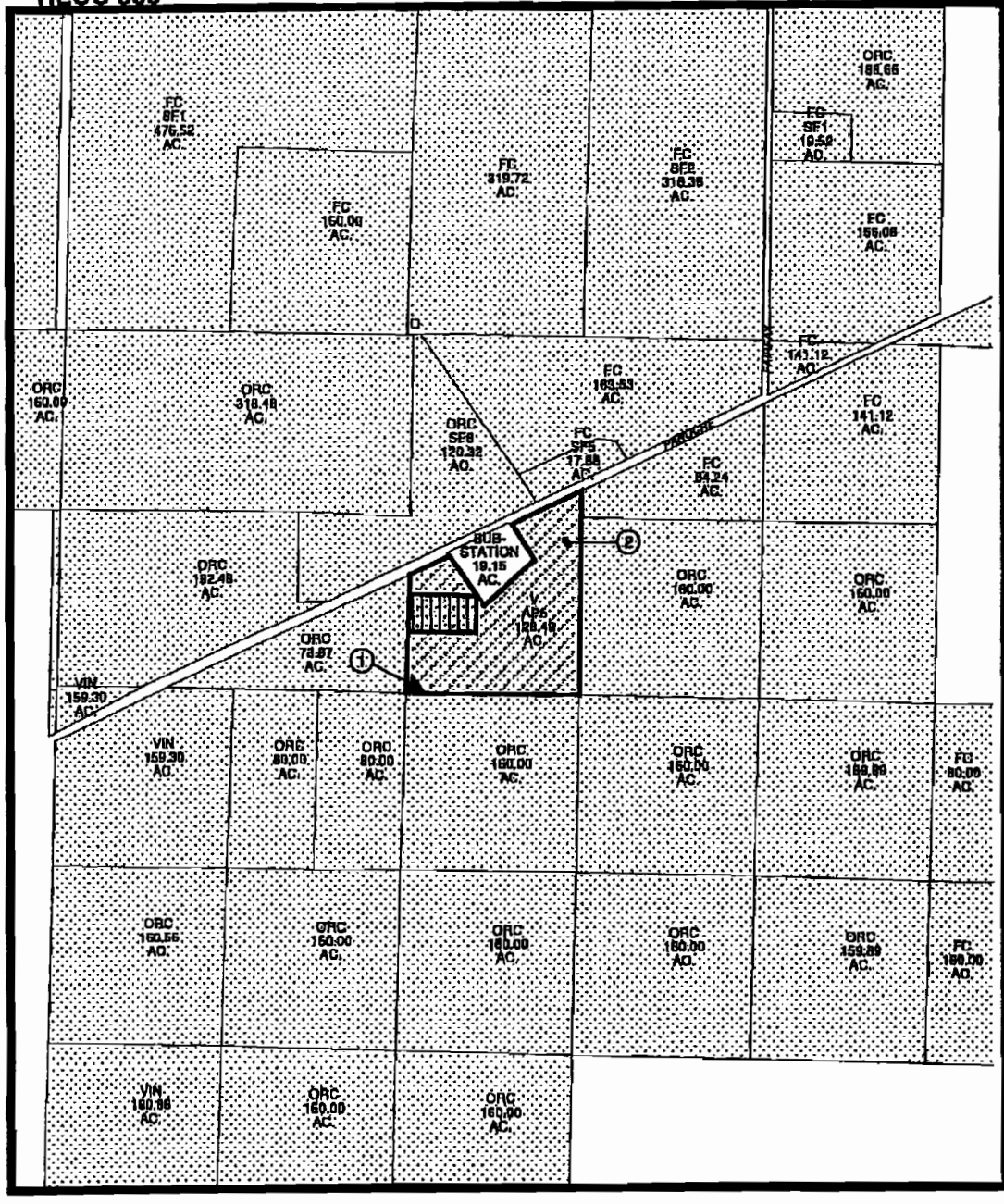


EXHIBIT 'B'

RLCC 838

EXISTING LAND USE MAP



Legend

AP1 - APARTMENT
FC - FIELD CROP
ORC - ORCHARD
SF#- SINGLE FAMILY RESIDENCE
V - VACANT
VIN - VINEYARD

Subject Property

Ag Contract Land

Area to be Removed from Ag Contract Land

(1) Government Owned

(2) PG&E Owned

N W E S

0.2 0 0.2 0.4 0.6 0.8 Miles

Prepared by: County of Fresno The Department of Public Works and Planning HEL8752

EXHIBIT 'C'

EXHIBIT 'D'

Inter Office Memo

DATE: March 14, 2007

TO: PAO Investments, LLC

FROM: Briza Sholars, Development Services

SUBJECT: CEQA Determination
Environmental Review No. 5785 (45499 Panoche Road)

Project Description:

The project proposes a partial cancellation of Williamson Act Contract No. 367 on 12.8 acres of a 128 acre parcel of land in the AE-20 (Exclusive Agriculture, 20-acre minimum lot size) Zone District to allow for future development of a thermal power plant. The project is located on the south side of Panoche Road between South Brannon Avenue and South Fairfax Avenue in an unincorporated area of Fresno County.

Determination

The proposed project is considered Statutory exempt from the California Environmental Quality Act (CEQA), under Section 15271, Early Activities Related to Thermal Power Plants. The following supports this determination:

1. The intent of Section 15271 of the CEQA Guidelines is to exempt or delay early activities related to thermal electric power plants which will be the subject of an EIR or Negative Declaration or other document or documents prepared pursuant to a regulatory program certified pursuant to Public Resources Code Section 21080.5, which will be prepared by:

   (a) The State Energy Resources Conservation and Development Commission,

   (b) The Public Utilities Commission, or

   (c) The city or county in which the power plant and related facility would be located.

2. Cancellation of Williamson Act Contract No. 367 is required for development of the proposed thermal power plant and is therefore, determined to an early activity required for the project.

3. The cancellation of Williamson Act Contract No. 367 as an early activity will be further analyzed as part of an EIR, Negative Declaration, or other

document prepared for the proposed thermal power plant site or facility, as required under Section 15271.

4. The division of land is proposed in accordance with the County's General Plan and Zoning Ordinance. The project will not result in any adverse impacts to the environment.

The proposed project meets the criteria for Section I5271 and is exempt from the provisions of CEQA.

If you have any questions, please call me at 262-4454.

C:\Documents and Settings\tacosta-mena\Local Settings\Temporary Internet Files\OLKDF\ER 5785 (2).doc

DEPARTMENT OF CONSERVATION

DIVISION OF LAND RESOURCE PROTECTION

801 K STREET • MS 18-01 • SACRAMENTO, CALIFORNIA 95814

PHONE 916 / 324-0850 • FAX 916 / 327-3430 • TDD 916 / 324-2555 • WEBSITE conservation.ca.gov

RECEIVED
JAN 25 2007
FRESNO COUNTY
DEPT. OF
PUBLIC WORKS & PLANNING

January 19, 2007

Mr. Jared Nimer, Planner II
Fresno County Department of Public Works and Planning
Development Services Division
2220 Tulare Street, Sixth Floor
Fresno, CA 93721

Subject: Partial Cancellation of Land Conservation (Williamson Act) Contract ALCC No. 367 (RLCC 838); APN 027-060-78s portion - PAO Investments

Dear Mr. Nimer:

Thank you for submitting notice to the Department of Conservation (Department) as required by Government Code section 51284.1 for the above referenced matter.

The petition proposes to cancel a 12.82-acre portion of the parcel's 128.49 prime agricultural acres subject to Contract No. 367 for development of a 200-megawatt thermal power plant. The parcel's remaining 115 acres are currently undergoing the nonrenewal process for contract termination.

The site is located south and adjacent to West Panoche Road, approximately ¾ of a mile west of the intersection of Fairfax Avenue and West Panoche Road in Fresno County.

Cancellation Findings

Government Code Section 51282 states that tentative approval for cancellation may be granted only if the local government makes one of the following findings: 1) cancellation is **consistent** with purposes of the Williamson Act or 2) cancellation is in the **public interest**. The Department has reviewed the petition and information provided and offers the following comments.

Cancellation is consistent with the purposes of the Williamson Act

For the cancellation to be consistent with purposes of the Williamson Act, the Fresno County Board of Supervisors must make all of the following five findings: 1) a notice

of nonrenewal has been served, 2) removal of adjacent land from agricultural use is unlikely, 3) the alternative use is consistent with the County's General Plan, 4) discontiguous patterns of urban development will not result, and 5) that there is no proximate noncontracted land which is available and suitable for the use proposed on the contracted land or that development of the contracted land would provide more contiguous patterns of urban development than development of proximate noncontracted land.

Provided the information received is accurate and correct, the Department concurs the Board has a basis to find cancellation of the 12.82-acre portion of the contract consistent with the purposes of the Williamson Act.

The landowner served a notice of nonrenewal. The 128.49-acre portion of Contract No. 367 (APN 027-060-78s) is scheduled to expire on December 31, 2016. Development of the proposed power generation facility will not negatively affect adjacent agricultural lands or cause their removal from agricultural use.

The proposed alternative use appears consistent with the agricultural land use policies contained in the Fresno County General Plan. The proposed alternative use will not produce discontiguous patterns of urban development and due to the location of the existing PG&E substation, the Department would concur that there is not proximate noncontracted land that is suitable or available for the alternative use proposed.

Cancellation is in the Public Interest

For the cancellation to be in the public interest, the Council must make findings with respect to all of the following: (1) other public concerns substantially outweigh the objectives of the Williamson Act and (2) that there is no proximate noncontracted land which is available and suitable for the use proposed on the contracted land or that development of the contracted land would provide more contiguous patterns of urban development than development of proximate noncontracted land. Our comments have already addressed the second finding required under public interest finding above.

In order to find that "other public concerns substantially outweigh the objectives of the Williamson Act," the Supreme Court has directed that the Board must consider the interest of the public as a whole in the value of the land for open space and agricultural use. Though the interests of the local and regional communities involved are also important, no decision regarding the public interest can be based exclusively on their parochialism. Moreover, the paramount 'interest' involved is the preservation of land in agricultural production. In providing for cancellation, the Legislature has recognized the relevance of other interests, such as housing, needed services, environmental protection through developed uses, economic growth and employment. However, it must be shown that open space objectives, explicitly and unequivocally protected by the act, are substantially outweighed by other public concerns before the cancellation can be deemed "in the public interest" (Sierra Club v City of Hayward (1981), 28 Cal. 3d. 840, 857).

As a general rule, land can be withdrawn from Williamson Act contract through the nine-year nonrenewal process. The Supreme Court has opined that cancellation is reserved for extraordinary situations (Sierra Club v. City of Hayward (1981), 28 Cal.3d 840).

Lastly, legislation effective January 1, 2005, requires the county assessor to send notice to the Department and landowner of the current fair market value of the land and of the opportunity to request a formal review from the assessor prior to any action giving tentative approval to the cancellation of any contract. (SB 1820, Machado, Chapter 794, Statutes of 2004 (Section 51283(a)). To date, the Department has not received the required notice of the parcel's cancellation valuation.

Thank you for the opportunity to provide comments on the proposed cancellation. Please provide our office with a copy of the Notice of the Public Hearing on this matter ten (10) working days before the hearing and a copy of the published notice of the Board's decision within 30 days of the tentative cancellation pursuant to section 51284. If you have any questions concerning our comments, please contact Adele Lagomarsino, Program Analyst at (916) 445-9411.

Sincerely,

Dennis J. O'Bryant
Program Manager

County of Fresno

DEPARTMENT OF PUBLIC WORKS AND PLANNING
ALAN WEAVER, DIRECTOR

NOTICE OF PUBLIC HEARING
FRESNO COUNTY BOARD OF SUPERVISORS

A public hearing will be held on Revision to Land Conservation Contract (RLCC) No. 838 filed by PAO Investments, LLC proposing to:

> Allow partial cancellation of ALCC No. 838 to remove 12.82 acres of prime agricultural land from Williamson Act contract restrictions for development of a 200-megawatt thermal power plant. The subject property is located on the south side of Panoche Road between Interstate 5 and Fairfax Avenue approximately 12.6 miles southwest of the city limits of Mendota. (45499 Panoche Road) (SUP. DIST. 1) (APN: 027-060-78s).

The Board of Supervisors hearing will be held at **2:00 p.m.** (or as soon thereafter as possible) on Tuesday, **April 24, 2007**, in Room 301, Hall of Records, Tulare and "M" Streets, Fresno.

Anyone may testify. For information, contact Jared Nimer, Department of Public Works and Planning, Development Services Division, 2220 Tulare Street, (Corner of Tulare & "M" Streets, Suite "B") Fresno, CA 93721, Phone: (559) 262-4846.

ALAN WEAVER, DIRECTOR
Department of Public Works and Planning

NOTES:

Please share this notice with your neighbors and with anyone you feel may be interested.

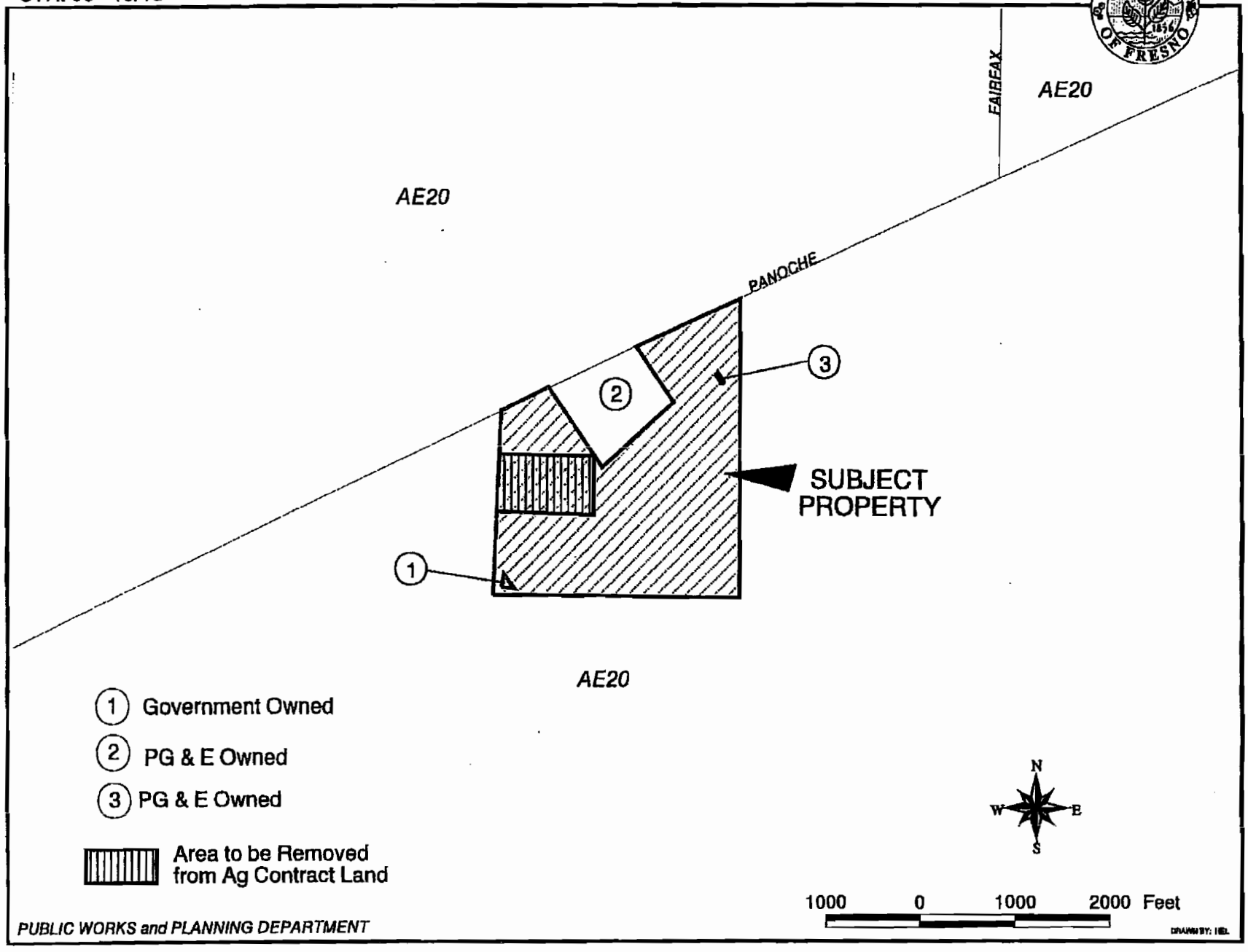
If at some later date you challenge the final action on this matter in court, you may be limited to raising only those issues you or someone else raised at the Public Hearing described in the notice or in written correspondence delivered to the Board of Supervisors at, or prior to, the public hearing.

SEE MAP ON REVERSE SIDE

G:\4360Devs&Pln\PLANNING\AG\RLCC - Apps\Active Cancellation\RLCC 838 PAO Investments\mailing notice.doc

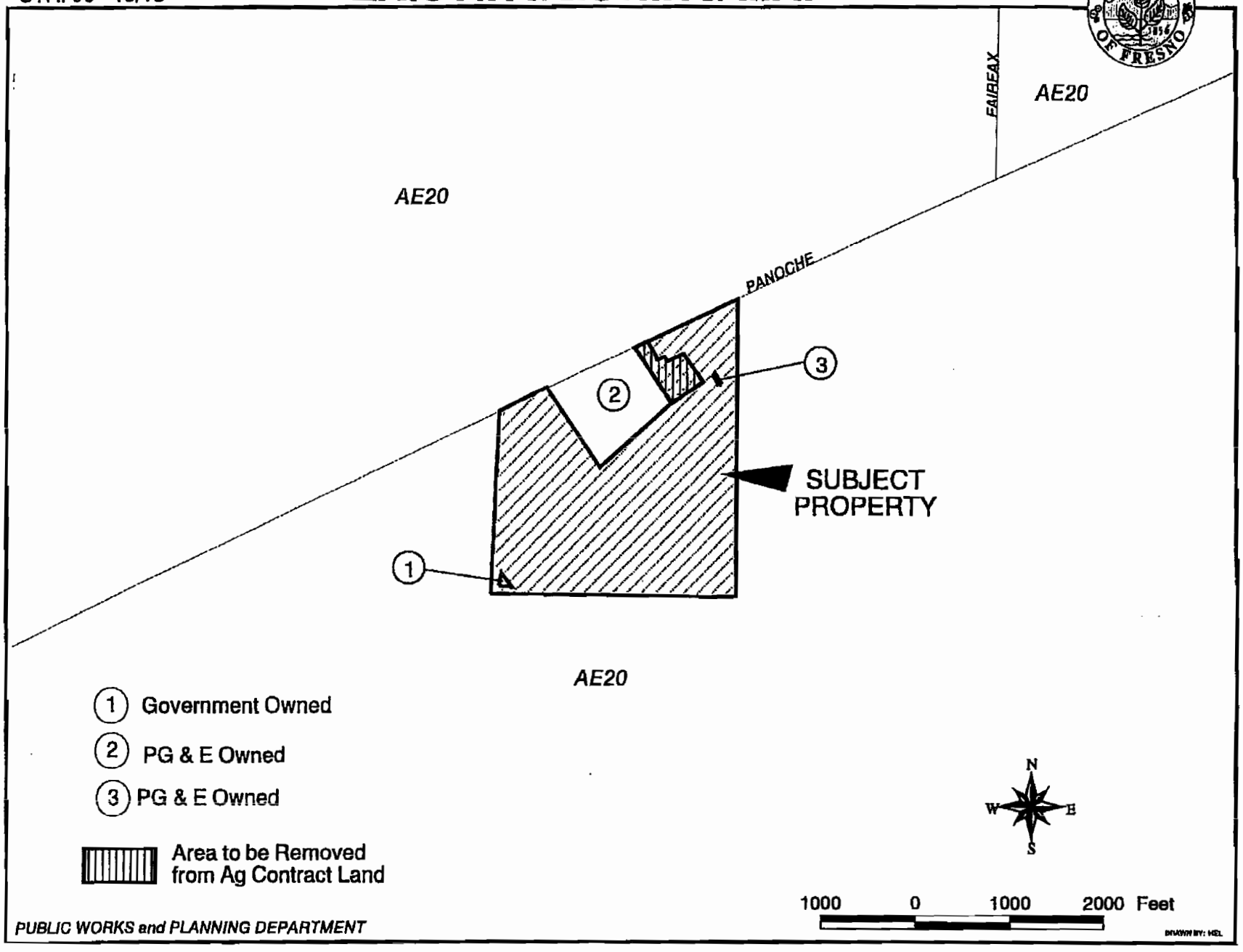
RLCC 838
STR: 06 - 15/13

EXISTING ZONING MAP



RLCC 843
STR: 06 - 15/13

EXISTING ZONING MAP



LAND USE APPENDIX 2

4

AFTER RECORDING,

RETURN TO STOP #214

FRESNO County Recorder
Robert C. Werner
DOC- 2007-0090289
Monday, MAY 07, 2007 11:37:59
Ttl Pd $0.00 Nbr-0002498882
APR/R1/1-4

DOCKET
06-AFC-5

DATE MAY 0 9 2007
RECD. MAY 0 9 2007

BEFORE THE BOARD OF SUPERVISORS

OF THE COUNTY OF FRESNO

STATE OF CALIFORNIA

IN THE MATTER OF AGRICULTURAL LAND CONSERVATION CONTRACT	RESOLUTION APPROVING PARTIAL CANCELLATION OF AGRICULTURAL LAND CONSERVATION CONTRACT NO. 367 (RLCC No. 838)

WHEREAS, Agricultural Land Conservation Contract (ALCC) No. 367 was entered into between the County of Fresno and Russell Giffen and Ruth P. Giffen, and succeeded to by PAO Investments, LLC, hereafter referred to as "Owners", and recorded February 27, 1969, as Instrument No. 13855, Book 5665, Pages 182 to 185, of the Official Records of Fresno County, California, and

WHEREAS, in accordance with Section 51283(b) of the Government Code, the County Assessor certified the cancellation valuation to this Board for determination of the cancellation fee; and

WHEREAS, this Board has determined the cancellation fee to be in the amount of $6,375.00; and

WHEREAS, the Agricultural Land Conservation Committee has recommended approval of the proposed cancellation because of the ability to make all of the required findings in accordance with Section 51282(b) of the Government Code:

1. That the cancellation is for land on which notice of non-renewal has been served pursuant to Section 51245.

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

3. That the cancellation is for an alternative use that is consistent with the provisions of the County General Plan.

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

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 contracted land would provide more contiguous patterns of urban development than development of proximate non-contracted land; and

WHEREAS, in accordance with Section 51284.1(c) of the Government Code the Board has considered the comments of the Department of Conservation ("DOC"); and

WHEREAS, the Board has determined the cancellation to be consistent with the purposes of the Williamson Act, subject to the following conditions:

1. Payment in full of the cancellation fee, which is in the amount of $6,375.00.

2. Unless the cancellation fee is paid or a Certificate of Cancellation of Contract is issued within one year from the date of the recording of this certificate, the cancellation fee shall be recomputed as of the date of notice by the landowner to the Board of Supervisors as required by Government Code Section 51283.4.

3. The landowner shall obtain all permits necessary to commence the project.

NOW, THEREFORE BE IT RESOLVED that the Board of Supervisors hereby finds this cancellation of said contract as to 12.82 acres to be consistent with the purposes of the Williamson Act; and

BE IT FURTHER RESOLVED that the partial cancellation of this contract be and it hereby is approved for the 12.82-acre portion of ALCC No. 367 described on the attached legal description (Exhibit "A"), subject to the following conditions:

1. Payment in full of the cancellation fee, which is in the amount of $6,375.00.

2. Unless the cancellation fee is paid or a Certificate of Cancellation of Contract is issued within one year from the date of the recording of this certificate, the unitary cancellation fee shall be recomputed as of the date of notice by the landowner to the Board of Supervisors as required by Government Code Section 51283.4.

3. The landowner shall obtain all permits necessary to commence the project; and

BE IT FURTHER RESOLVED that the Chairman is authorized to execute a Certificate of Tentative Cancellation, and upon satisfaction of conditions of approval stated above to execute a Certificate of Partial Cancellation of ALCC No. 367.

THE FOREGOING was passed and adopted by the following vote of the Board of Supervisors of the County of Fresno this 24th day of April 2007, to-wit:

AYES: Supervisors Larson, Perea, Anderson, Case, Waterston

NOES: None

ABSENT: None

CHAIRMAN, Board of Supervisors

ATTEST:

BERNICE E. SEIDEL, Clerk
Board of Supervisors

By _____ Deputy

Agenda #19

Resolution #07-203

G:\4360Devs&Pln\ADMIN\BOARD\Board Items\2007\04-24-07\RLCC 838_PAO_Res.doc

EXHIBIT 'A'

Legal Description
Area Covered by Petition for Partial
Cancellation of Williamson Act Contract

Being a portion of real property in the Southwest Quarter of Section 5 Township 15 South, Range 13 East, Mount Diablo Base and Meridian, according to the official plat thereof lying Southerly of Panoche Road, being a portion of that certain real property described in a document dated June 13, 1978 to Robert Hansen, Trustee under the Sharla M. Baker Trust as Instrument No. 89-106620 Official Records, County of Fresno, vicinity of Firebaugh, California more particularly described as follows:

COMMENCING at the Southwest Corner of said Section 5 at a found 2" iron pipe thence along the West line of said Section 5 being the Southwest Quarter thereof North 01°34'29" East 902.88 feet; thence leaving the West line of said Section 5 through the interior of said Southwest Quarter of Section 5 the following seven (7) courses: South 89°10'03" East 39.95 feet to the POINT OF BEGINNING of the herein described real property; North 00°49'57" East 522.11 feet; South 89°10'03" East 1,001.11 feet; South 00°49'57" West 690.97 feet; North 89°10'03" West 212.94 feet; North 00°49'57" East 168.86 feet; North 89°10'03" West 788.17 feet to the POINT OF BEGINNING.

Containing 558,646 square feet of land (12.82 acres) more or less.

This description is based on record information. The Basis of Bearings are NAD 1983, Epoch 2004.50, California Coordinate System, Zone 4 and are based upon a GPS Survey constrained to NGS monuments: AC6117 (HPGN D CA 06 NC) survey disk in bridge abutment and GU4142 (Z 1444) stainless steel rod.

DOCKET
06-AFC-5
DATE MAY 0 9 2007
RECD. MAY 0 9 2007

3

AFTER RECORDING,
RETURN TO STOP #214

FRESNO County Recorder
Robert C. Werner
DOC- 2007-0090290
Monday, MAY 07, 2007 11:37:59
Ttl Pd $0.00 Nbr-0002498883
APR/R1/1-3

BEFORE THE BOARD OF SUPERVISORS

OF THE COUNTY OF FRESNO

STATE OF CALIFORNIA

CERTIFICATE OF TENTATIVE CANCELLATION

(less than the total of the land subject to contract)

NOTICE IS HEREBY GIVEN:

By resolution dated April 24, 2007, the Board of Supervisors of the County of Fresno granted tentative approval of the petition by PAO Investments, LLC for cancellation of a portion of Agricultural Land Conservation Contract (ALCC) No. 367, which applies to the real property situated in the County of Fresno, State of California, and is more particularly described on the legal description attached as Exhibit "A" and made a part hereof describing the 12.82-acre parcel subject to cancellation.

The above-referenced property is less than the total of the real property subject to ALCC No. 367.

A Certificate of Cancellation of the Contract shall be issued and recorded at such time as the following contingencies and conditions are satisfied:

1. Payment in full of the cancellation fee, which is in the amount of $6,375.00.
2. Unless the cancellation fee is paid or a Certificate of Cancellation of Contract is issued within one year from the date of the recording of this certificate, the cancellation fee shall be recomputed as of the date of

notice by the landowner to the Board of Supervisors required by Government Code Section 51283.4.

3. The landowner shall obtain all permits necessary to commence the project.

IN WITNESS WHEREOF, I have unto set my hand and seal this 24th day of April, 2007.

Bob Waterston, Chairman
Board of Supervisors

ATTEST:

Bernice E. Seidel, Clerk
Board of Supervisors

By Deputy

G:\4360Devs&Pln\ADMIN\BOARD\Board Items\2007\04-24-07\RLCC 838_PAO_CTC.doc

EXHIBIT 'A'

Legal Description
Area Covered by Petition for Partial
Cancellation of Williamson Act Contract

Being a portion of real property in the Southwest Quarter of Section 5 Township 15 South, Range 13 East, Mount Diablo Base and Meridian, according to the official plat thereof lying Southerly of Panoche Road, being a portion of that certain real property described in a document dated June 13, 1978 to Robert Hansen, Trustee under the Sharla M. Baker Trust as Instrument No. 89-106620 Official Records, County of Fresno, vicinity of Firebaugh, California more particularly described as follows:

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LAND USE APPENDIX 3

TABLE LU-3

TYPICAL USES ALLOWED IN AREAS DESIGNATED AGRICULTURE (Policies LU-A.2 and LU-A.3)

BY RIGHT	SPECIAL PERMIT USES		
Agricultural Uses	**Special Agricultural Uses**	**Agriculturally-Related & Value-Added Agricultural Uses**	**Agricultural Commercial Center Uses & Other Non-Agricultural Uses**
Crop & livestock production, except as specified under special permit uses Packing, processing & sale of crops produced on premises, or where such activity is carried on in conjunction with or as part of a bonafide agricultural operation under the same ownership, except as specified under special permit uses Sale of livestock produced or raised on the premises Residences Home occupations Certain oil & gas development activities pursuant to the policies in Section OS-C, Mineral Resources, of the Open Space and Conservation Element	Cattle feed lots Dairies Goat lots Swine yards Poultry operations Fish farms	Wineries & distilleries Cotton ginning Cottonseed delinting Tree nut hulling & shelling Trucking operations servicing the agricultural community Inspection & weighing services associated with transportation of agricultural products Commercial land leveling & developing establishments Farm labor camps Commercial grain elevators Dehydration operations Commercial soil preparation service establishments Commercial packing & processing of crops Commercial meat processing plants	Commercial Centers: • Veterinary Services & hospitals • Medical & health services • Irrigation systems administration offices • Water-well drilling services • Farm equipment & machinery sales, rental, storage & maintenance • Welding & blacksmith shops • Agricultural employment services • Feed & farm supply sales • Fertilizer sales • Building materials sales • Hardware stores • Grocery stores • Gasoline service stations • Liquefied petroleum gas distribution & storage • Livestock auction market Other: • Organic & inorganic fertilizer manufacturing & mixing • Boarding & training kennels • Home occupations • Sewage treatment plants • Solid waste disposal • Race tracks • Pistol & rifle range • Churches • Schools • Cemeteries • Commercial stables & riding academies • Golf courses • Radio & television broadcasting stations • Wireless communication facilities • Electrical substations • Liquefied petroleum gas distribution & storage • Airports • Detention facilities • Interstate freeway commercial development • Mineral extraction and oil and gas development pursuant to the policies in Section OS-C, Mineral Resources, of the Open Space and Conservation Element.

LAND USE APPENDIX 4

Table 1A.
Land Evaluation Worksheet

Land Capability Classification (LCC) and Storie Index Scores

A	B	C	D	E	F	G	H
Soil Map Unit	Project Acres	Proportion of Project Area	LCC	LCC Rating	LCC Score	Storie Index	Storie Index Score
[illegible]	15	1	I	[illegible]	[illegible]	75	75
		1					
Totals	15	(Must Sum to 1.0)		***LCC Total***	100	***Storie Index Total***	75

Table 1B.
Site Assessment Worksheet 1.

Project Size Score

	I	J	K
	LCC Class I - II	LCC Class III	LCC Class IV - VIII
	15		
Total Acres	15		
Project Size Scores	30		

Highest Project Size Score 30

Table 4. Site Assessment Worksheet 2. - Water Resources Availability

A	B	C	D	E
Project Portion	Water Source	Proportion of Project Area	Water Availability Score	Weighted Availability Score (C x D)
1	irrigation	1	[illegible]	[illegible]
2				
3				
4				
5				
6				
		(Must Sum to 1.0)	***Total Water Resource Score***	[illegible]

Site Assessment Worksheet 3.

Surrounding Agricultural Land and Surrounding Protected Resource Land

A	B	C	D	E	F	G
Zone of Influence						
Total Acres	Acres in Agriculture	Acres of Protected Resource Land	Percent in Agriculture (A/B)	Percent Protected Resource Land (A/C)	Surrounding Agricultural Land Score (From Table)	Surrounding Protected Resource Land Score (From Table)
15	15	[illegible]	100	100	[illegible]	[illegible]

Table 8. Final LESA Scoresheet

A	B		C		D
Factor Name	Factor Rating (0-100 points)	X	Factor Weighting (Total = 1.00)	=	Weighted Factor Rating
Land Evaluation					
1. Land Capability Classification	<Line 1> 100	X	0.25	=	25
2. Storie Index Rating	<Line 2> 85	X	0.25	=	21.25
Site Assessment					
1. Project Size	<Line 3> 30	X	0.15	=	4.5
2. Water Resource Availability	<Line 4> 90	X	0.15	=	13.5
3. Surrounding Agricultural Lands	<Line 5> 100	X	0.15	=	15.0
4. Protected Resource Lands	<Line 6> 100	X	0.05	=	5.0
			Total LESA Score (sum of weighted factor ratings)		<Line 7> 84.25

80-100 = [illegible]

NOISE AND VIBRATION

Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

The Panoche Energy Center (PEC), if built and operated in compliance with the following proposed conditions of certification, would comply with all applicable noise and vibration LORS and would result in less than significant noise impacts. The applicant has proposed appropriate mitigation in the form of good design practice and inclusion of necessary project equipment.

INTRODUCTION

The construction and operation of any power plant creates noise, or unwanted sound. The character and loudness of this noise, the times of day or night that it is produced, and the proximity of the facility to sensitive receptors combine to determine whether the facility would meet applicable noise control laws and ordinances, and whether it would cause significant adverse environmental impacts. In some cases, vibration may be produced as a result of power plant construction practices, such as blasting or pile driving. The ground-borne energy of vibration has the potential to cause structural damage and annoyance.

The purpose of this analysis is to identify and examine the likely noise and vibration impacts from the construction and operation of the PEC, and to recommend procedures to ensure that the resulting noise and vibration impacts would be adequately mitigated to comply with applicable laws, ordinances, regulations and standards (LORS). For an explanation of technical terms employed in this section, please refer to **Noise Appendix A** immediately following.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

NOISE Table 1
Laws, Ordinances, Regulations and Standards (LORS)

Applicable Law	Description
Federal:	
Occupational Safety & Health Act (OSHA): 29 U.S.C. § 651 et seq.; 29 C.F.R § 1910.95	Protects workers from the effects of occupational noise exposure
State:	
California Occupational Safety & Health Act (Cal-OSHA): Cal. Code Regs., tit. 8, §§ 5095-5099	Protects workers from the effects of occupational noise exposure
Local:	
Fresno County General Plan, Noise Element	References the County of Fresno Ordinance Code for noise limits.
Fresno County Ordinance Code, Noise Control, Section 8.40.040	Sets sound level limits at residences and outdoor activity areas.
Fresno County Ordinance Code, Noise Control, Section 8.40.060	Restricts the hours of construction activities.

FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise exposure levels as a function of the amount of time during which the worker is exposed (see **Noise Appendix A, Table A4** immediately following this section). The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed, assuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.

Guidelines are available from the U.S. Environmental Protection Agency (USEPA) to assist state and local government entities in development of state and local LORS for noise. Because there are existing local LORS that apply to this project, the USEPA guidelines are not applicable.

There are no federal laws governing off-site (community) noise.

The Federal Transit Administration (FTA) has published guidelines for assessing the impacts of ground-borne vibration associated with construction of rail projects, which have been applied by other jurisdictions to other types of projects. The FTA-recommended vibration standards are expressed in terms of the "vibration level," which

is calculated from the peak particle velocity measured from ground-borne vibration. The FTA measure of the threshold of perception is 65 VdB, which correlates to a peak particle velocity of about 0.002 inches per second (in/sec). The FTA measure of the threshold of architectural damage for conventional sensitive structures is 100 VdB, which correlates to a peak particle velocity of about 0.2 in/sec.

STATE

California Government Code section 65302(f) encourages each local governmental entity to perform noise studies and implement a noise element as part of its General Plan. In addition, the California Office of Planning and Research has published guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure.

The State of California, Office of Noise Control, prepared a Model Community Noise Control Ordinance, which provides guidance for acceptable noise levels in the absence of local noise standards. The Model also contains a definition of a simple tone, or "pure tone," in terms of one-third octave band sound pressure levels that can be used to determine whether a noise source contains annoying tonal components. The Model Community Noise Control Ordinance further recommends that when a pure tone is present, the applicable noise standard should be lowered (made more stringent) by five dBA.

The California Occupational Safety and Health Administration (Cal-OSHA) has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, §§ 5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards (see **Noise Appendix A, Table A4**).

LOCAL

Noise Element of the Fresno County General Plan

The project is located in an unincorporated area of western Fresno County. The Noise Element of the Fresno County General Plan (County 2006a) applies to the project. Policy HS-G.4 of this element requires an acoustical analysis where a proposed project is likely to produce noise levels in excess of the County's Ordinance Code at noise-sensitive uses. (PEC 2006a, § 5.12.4.3.1; Table 5.12-6). Policy HS-G.6 of this element states: the County shall regulate construction-related noise to reduce impacts on adjacent uses in accordance with the County's Ordinance Code.

According to this element, an exterior noise level of up to 60 dBA CNEL is compatible with residential land uses. Because of the weighting and averaging nature of the CNEL, a constant noise source, such as a power plant, produces a CNEL approximately 7 dBA higher than its L_{eq}. Therefore, exterior noise levels produced by the PEC to levels up to 53 dBA L_{eq} are compatible with residential land uses in the project area. This analysis requires the project to meet the more stringent requirement of the applicable local noise LORS, the County's Ordinance Code, as shown below.

Fresno County Ordinance Code

Chapter 8.40, Noise Ordinance of the Fresno County Code (County 2006b) also applies to the PEC. Section 8.40.040 of this ordinance limits exterior noise levels from any stationary on-site or non-transportation noise source at any affected single- or multiple-family residence, school, hospital, church or public library. These limits are summarized in **Noise Table 2**, below.

NOISE Table 2
Exterior Noise Standards

Category	Cumulative Number Of Minutes In Any One-Hour Time Period	Noise Level Standards, dBA Daytime 7 a.m. to 10 p.m.	Noise Level Standards, dBA Nighttime 10 p.m. to 7 a.m.
1	30	50	45
2	15	55	50
3	5	60	55
4	1	65	60
5	0	70	65

As seen above, a project cannot produce nighttime exterior sound level at any residence in excess of 45 dBA for more than 30 minutes in any one-hour period (45 dBA L_{50}). This is the lowest level, and thus, the most stringent requirement in the above table. The PEC operational noise levels shall meet this requirement at the project's most noise-sensitive residential receptors (see below for the locations of these receptors).

Section 8.40.060 of this ordinance restricts construction activities to the hours between 6:00 a.m. and 9:00 p.m. on any day except Saturdays and Sundays, and between 7:00 a.m. and 5:00 p.m. on Saturdays and Sundays.

Staff uses these standards to evaluate the project noise impact from the operation and construction of the PEC.

SETTING

The proposed power plant will be built on a 12.8-acre site, located in an unincorporated area within Fresno County, approximately 50 miles west of the city of Fresno. This site is zoned AE-20, Exclusive Agriculture District (see **Noise Figure 1**). Surrounding land uses are generally agricultural, with some residential use. The predominant noise sources in the area include vehicular (automobiles and agricultural equipment) and industrial noise from mechanical equipment and processes at the existing Wellhead Power Panoche, LLC power plant, CalPeak Power Project and Pacific Gas & Electric (PG&E) substation (PEC 2006a, §§ 5.4.1, 5.12.1.3).

Sensitive residential properties in the vicinity of the project include structures located northeast and north of the site. The residential building northeast of the site is a multiplex with five units. This building (near ambient noise monitoring location ML1) is located approximately 1,900 feet from the center of the proposed plant. There are three single-family residential structures to the north of the site, in a row from east to west. The center building is inhabited; the other two appear to be uninhabitable. These buildings are near ambient noise monitoring location ML2 and are approximately 800 feet from the center of the proposed plant. There is a single-family residential structure to the northeast (near ambient noise monitoring location ML3), located approximately 3,300 feet from the center of the site.

For purposes of evaluating impacts on residential uses, the project noise is compared to the measured nighttime ambient noise levels, when residents are trying to sleep.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires that significant environmental impacts be identified and that such impacts be eliminated or mitigated to the extent feasible. Section XI of Appendix G of CEQA Guidelines (Cal. Code Regs., tit. 14, App. G) sets forth some characteristics that may signify a potentially significant impact. Specifically, a significant effect from noise may exist if a project would result in:

1. exposure of persons to, or generation of, noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies;

2. exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

3. substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or

4. substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

The Energy Commission staff, in applying item 3 above to the analysis of this and other projects, has concluded that a potential for a significant noise impact exists where the noise of the project plus the background exceeds the background by 5 dBA or more at the nearest sensitive receptor, including those receptors that are considered a minority population.

Staff considers it reasonable to assume that an increase in background noise levels up to 5 dBA in a residential setting is insignificant; an increase of more than 10 dBA is clearly significant. An increase between 5 and 10 dBA should be considered adverse,

but may be either significant or insignificant, depending on the particular circumstances of a case.

Factors to be considered in determining the significance of an adverse impact as defined above include:

1. the resulting noise level [1];
2. the duration and frequency of the noise;
3. the number of people affected;
4. the land use designation of the affected receptor sites; and
5. public concern or controversy as demonstrated at workshops or hearings, or by correspondence.

Noise due to construction activities is usually considered to be insignificant in terms of CEQA compliance if:

- the construction activity is temporary;
- use of heavy equipment and noisy activities is limited to daytime hours; and
- all industry-standard noise abatement measures are implemented for noise-producing equipment.

Staff uses the above method and threshold to protect the most sensitive populations including the minority population.

Ambient Noise Monitoring

In order to establish a baseline for comparison of predicted project noise to existing ambient noise, the applicant has presented the results of an ambient noise survey (PEC 2006a, AFC § 5.12.1.2; Tables 5.12-2, 5.12-3; Figure 5.12-1). This survey was performed on Monday, June 19 through Tuesday, June 20, 2006, using acceptable equipment and techniques. The noise survey monitored existing noise levels at the following three locations, shown on **Noise Figure 2**:

1. Location ML1: This location is approximately 1,900 feet from the project site and represents the five-unit multiplex (5-Plex) northeast of the site. It was monitored continuously from 1:00 p.m. on June 19 through 2:00 p.m. on June 20.
2. Location ML2: This location is approximately 800 feet from the project site and represents the three single-family residential structures north of the site. It was

[1] For example, a noise level of 40 dBA would be considered quiet in many locations. A noise limit of 40 dBA would be consistent with the recommendations of the California Model Community Noise Control Ordinance for rural environments and with industrial noise regulations adopted by European jurisdictions. If the project would create an increase in ambient noise no greater than 10 dBA at nearby sensitive receptors, and the resulting noise level would be 40 dBA or less, the project noise level would likely be insignificant.

monitored on June 19 from 2:00 p.m. to 3:00 p.m. and from 9:05 p.m. to 10:00 p.m., and on June 20 from 12:35 a.m. to 1:35 a.m.

3. Location ML3: Located at 43405 West Panoche Road, approximately 3,300 feet from the project site. It represents the single-family residential structure northeast of the site. This location was monitored on June 19 from 3:30 p.m. to 4:30 p.m. and from 7:00 p.m. to 8:00 p.m., and on June 20 from 1:40 a.m. to 2:40 a.m.

As described above, the noise environment in the vicinity of the project site is dominated by vehicular traffic and industrial noise sources.

Noise Table 3 summarizes the existing ambient noise measurements at each measurement site (PEC 2006a, AFC § 5.12.1.2; Tables 5.12-2, 5.12-3).

NOISE Table 3
Summary of Measured Noise Levels

Measurement Sites	Measured Noise Levels, dBA		
	Average During Nighttime Hours		
	L_{eq}	L_{50}	L_{90}
ML1, 5-Plex to the northeast of the Project site	50[1]	44[1]	42[1]
ML2, Three single-family residential structures to the north of the Project site	41[2]	41[2]	39[2]
ML3, Single-family residential structure to the northeast of the Project site	47[2]	41[2]	41[2]

Source: PEC 2006a, AFC § 5.12.1.2; Tables 5.12-2, 5.12-3
[1] Staff's calculations of average of four quietest consecutive hours of the nighttime
[2] Results of the hourly measurements between midnight and 2:40 a.m.

DIRECT IMPACTS AND MITIGATION

Noise impacts associated with the project can be created by short-term construction activities, and by normal long-term operation of the power plant.

Construction Impacts and Mitigation

Construction noise is usually considered a temporary phenomenon. Construction of the PEC is expected to be typical of other power plants in terms of schedule, equipment used, and other types of activities.

Compliance with LORS

Construction of an industrial facility such as a power plant is typically noisier than permissible under usual noise ordinances. In order to allow the construction of new

facilities, construction noise during certain hours of the day is commonly exempt from enforcement by local ordinances.

The applicant has not predicted construction noise levels at the noise-sensitive receptors. Therefore, staff uses reference sound levels from typical construction equipment to estimate the project construction noise levels at the noise monitoring locations. Sound levels of typical construction equipment range from approximately 65 dBA to 95 dBA at 50 feet from the source, with an average of 89 dBA at 50 feet during the noisiest activities. Staff uses 89 dBA at 50 feet as the reference noise level for conventional construction noise. Based on this, staff has calculated the project estimated construction noise levels at the three noise monitoring locations; they are summarized here in **Noise Table 4**.

NOISE Table 4
Predicted Construction Noise Levels

Receptor/Distance	Highest Estimated Construction Noise Level (dBA) [1]	Measured Existing Ambient, Average Daytime L_{eq} (dBA) [2]	Cumulative	Change
ML1/1,900 feet	57	63	64	+1
ML2/800 feet	64	46	64	+18
ML3/3,300 feet	53	55	57	+2

Sources: [1] Average of noise level from conventional construction equipment during noisiest activities, and staff's calculations
[2] PEC 2006a, AFC Tables 5.12-2, 5.12-3; and staff's calculations

The applicable local noise LORS do not limit the loudness of construction noise, but staff compares the projected noise levels to the ambient. Since construction noise typically varies continually with time, it is most appropriately measured by, and compared to, the L_{eq} (energy average) metric. As seen in **Noise Table 4** above, construction noise at the residential units near monitoring location ML1 may reach 57 dBA. The ambient daytime L_{eq} level at this location, as seen in **Noise Table 4** above, is 63 dBA. The addition of the highest construction noise to the ambient would result in 64 dBA L_{eq}, an increase of 1 dBA over the ambient level. This increase is not noticeable.

Also, as seen in **Noise Table 4**, the ambient daytime L_{eq} level at ML2, or 46 dBA, when added to the highest construction noise at this location, or 64 dBA, results in 64 dBA L_{eq}, an increase of 18 dBA over the existing ambient level. As explained above, staff considers an increase of more than 10 dBA to be significant. An increase of 18 dBA in the ambient noise level at ML2 is substantial and can cause annoyance. However, the applicant is in the process of signing an agreement with the landowner of the property at ML2 to relocate the residents to a location that is approximately 4000 feet north of the PEC site, prior to start of noisy construction activities (PEC 2007d, Data Responses 69 and 70). At this new location, the above projected construction noise level would be

substantially lower, about 50 dBA. This level would not likely create annoyance, because the construction activities will be temporary and use of heavy equipment and noisy activities will be limited to daytime hours. To ensure that the relocation of this residence will occur, staff proposes Condition of Certification **NOISE-5**.

As seen in **Noise Table 4**, the ambient daytime L_{eq} level at ML3, or 55 dBA, when added to the highest construction noise at this location, or 53 dBA, results in 57 dBA L_{eq}, an increase of 2 dBA over the existing ambient level. This increase is not noticeable.

The applicant commits to performing noisy construction work during the daytime hours between 7:00 a.m. and 7:00 p.m. on any day except Saturdays and Sundays, and between 7:00 a.m. and 5:00 p.m. on Saturdays and Sundays (PEC 2006a, AFC § 5.12.2.1.1). This would be in compliance with the Noise Ordinance of the Fresno County Code. To ensure that the LORS limits are, in fact, adhered to, staff proposes Condition of Certification **NOISE-7**.

In light of the above proposed mitigation measures and the following proposed conditions of certification, the noise impacts of the PEC construction activities will comply with the noise LORS and no additional construction mitigation measures will be necessary.

In the event that actual construction noise should annoy nearby workers or residents, staff proposes Conditions of Certification NOISE-1 and NOISE-2, which would establish a Noise Complaint Process that requires the applicant to resolve any problems caused by construction noise.

CEQA Impacts

As explained above, in light of the following conditions of certification, increases in the ambient noise levels resulting from construction activities at the most noise-sensitive receptors would be mitigated to less than significant. Construction noise is temporary in nature and construction activities will occur during daytime hours. Staff thus concludes that project construction will create less than significant adverse impacts at these receptors. To ensure this, staff proposes Conditions of Certification **NOISE-1** and **NOISE-2**, which would establish a Noise Complaint Process to resolve any complaints regarding construction noise, and Condition of Certification **NOISE-7** which would limit construction activities to daytime hours.

Linear Facilities

New off-site linear facilities would include 2,400 feet of gas pipeline, a 300-foot transmission line to tie into the Panoche Substation, and an expansion of the Panoche Substation by approximately 2.2 acres south of the existing substation boundary (PEC 2006a, AFC §§ 1.2.1, 3.7.1.2, 3.11.3.1, 3.11.7.1).

Construction of linear facilities typically moves along at a rapid pace, thus not subjecting any one receptor to noise impacts for more than two or three days. Further, the Noise Ordinance of the Fresno County Code limits the hours of construction to daytime hours. The Applicant has committed to complying with this requirement (PEC 2006a,

AFC § 5.12.2.2). To ensure compliance with these limitations, staff proposes Condition of Certification **NOISE-7**.

Vibration

The only construction operation likely to produce vibration that could be perceived off-site would be pile driving. It is anticipated that pile driving will not be required for construction of the PEC. Therefore no vibration impacts are expected.

Worker Effects

The applicant has acknowledged the need to protect construction workers from noise hazards, and has recognized those applicable LORS that would protect construction workers (PEC 2006a, AFC Table 5.12-6; §§ 5.12.4.1, 5.12.4.2). To ensure that construction workers are, in fact, adequately protected, staff has proposed Condition of Certification **NOISE-3**.

Operation Impacts and Mitigation

The primary noise sources of the PEC include the gas turbine generators, gas turbine air inlets, exhaust stacks, wet cooling tower, natural gas fuel compressors, electrical transformers, selective catalytic reduction (SCR) duct walls, and various pumps and fans. Staff compares the projected project noise with applicable LORS, in this case, the Noise Ordinance of the Fresno County Code (County 2006b). In addition, staff evaluates any increase in noise levels at sensitive receptors due to the project in order to identify any significant adverse impacts.

The applicant's proposed noise mitigation measures include the following (PEC 2006a, AFC § 5.12.2.1.2; PEC 2007d, Data Responses 69 and 70; URS 2007a, E-mail from Maggie Fitzgerald):

- fuel gas compressor enclosure;
- exhaust stack silencing;
- generator enclosures;
- a 30-foot high barrier adjacent to the fuel gas compressors and combustion turbine generators; and
- other noise abatement modifications to supplied equipment.

In addition, the applicant has proposed to avoid the creation of annoying tonal (pure-tone) noises by balancing the noise emissions of various power plant features during plant design.

Compliance with LORS

The applicant performed noise modeling to determine the project's noise impacts on sensitive receptors (PEC 2006a, AFC § 5.12.2.1.2; Table 5.12-5). Project operating noise as predicted in the AFC would be 51 dBA at monitoring location ML1 (the 5-Plex northeast of the project site), 58 dBA at monitoring location ML2 (the residential receptor north of the project site), and 40 dBA at monitoring location ML3 (the single-family residential receptor northeast of the project site). As later predicted in an e-mail

from the applicant sent to staff on April 24, 2007 (URS 2007a), the project's operating noise would be 49 dBA at ML1 and 42 dBA at ML3. The applicant states that these new predictions are based on a revised noise modeling that generated more accurate and specific results than those reported in the AFC (URS 2007a). Therefore, staff uses these new values to evaluate the project's noise impacts at the above identified noise-sensitive receptors.

For residential receptors staff compares nighttime levels, when people are sleeping and more likely to be bothered by excessive noise. As explained above, the Noise Ordinance of the Fresno County Code (County 2006b) establishes the noise limits shown in **Noise Table 2** above. Staff uses the lowest of these limits, or 45 dBA L_{50}, to evaluate the project's noise impact at the above receptors.

The predicted project noise level at ML1, or 49 dBA, when combined with the average ambient noise level of the four quietest consecutive hours of the nighttime at this location, or 44 dBA L_{50} (see **Noise Table 3**), would result in 50 dBA L_{50}. This is 5 dBA above the LORS limit of 45 dBA L_{50} and thus violates the County code. Starwood Power-Midway, LLC recently filed an Application for Certification (06-AFC-10) with the Energy Commission to construct and operate the Starwood Power Project (SPP). The center of the project site would be approximately 460 feet from ML1. The SPP applicant has signed an agreement with the landowner of the 5-Plex at ML1 to relocate the current residents (URS 2006a, AFC § 5.12.5.2). As such, the 5-Plex would no longer be used for residential land use. Conversely, the applicant (the PEC applicant) has stated that if the SPP does not implement its agreement and ML1 remains a residential property, the applicant would be able to demonstrate compliance with the 45 dBA L_{50} limit (PEC 2007a, Data Response 41). In the AFC, the applicant states that it is assessing technically feasible noise mitigation measures to accomplish this goal. It also states that efforts are currently ongoing to obtain confirmation from equipment manufacturers and noise control vendors on additional mitigation measures that can be utilized for noise reduction of the PEC (PEC 2006a, AFC § 5.12.3). Because relocating the residents at ML1 would be done by the SPP applicant and because the following conditions of certifications apply only to the PEC project, this analysis cannot require the relocation. It can, however, require that the applicant ensure project's compliance with the LORS. Thus, as seen in Condition of Certification **NOISE-4** below, whether ML1 remains a residential property or the residents are relocated, the condition requires that the project comply with the LORS. If the SPP implements its agreement and relocates the residents to a location within one mile of the PEC project site, the PEC shall perform a noise monitoring survey during its operation at the new location. (Staff chooses the one-mile zone because beyond that distance the power plant would likely be inaudible.) If the survey indicates non-compliance with the noise LORS or significant impact at the new location, the applicant shall implement additional mitigation measures in order to bring the noise level into compliance (see Condition of Certification **NOISE-4** below).

The predicted project noise level at ML2, or 58 dBA, when combined with the nighttime ambient level of 41 dBA L_{50} (**Noise Table 3**, above), would result in 58 dBA L_{50}. This violates the LORS limit of 45 dBA L_{50} by 13 dBA. As explained above, the applicant is in the process of signing an agreement with the landowner of the property at ML2 to relocate the residents to a location that is approximately 4000 feet north of the PEC site, prior to start of noisy construction activities (PEC 2007d, Data Responses 69 and 70).

At this new location, the above projected operational noise level, with further mitigation, would be 41 dBA, as predicted by the applicant (URS 2007a). This level is less than the above LORS limit and thus in compliance with this LORS. To ensure the relocation of this residence and compliance with this LORS limit, staff proposes Condition of Certification **NOISE-5**.

The predicted project noise level at ML3, or 42 dBA, when combined with the nighttime ambient level of 41 dBA L_{50} at this location (**Noise Table 3**, above), would result in 45 dBA L_{50}. This is in compliance with the limit of 45 dBA L_{50}.

In light of the above mitigation measures and the following proposed conditions of certification, staff can conclude that the project operational noise levels at the most sensitive residential receptors will be in compliance with the Noise Ordinance of the Fresno County Code. To ensure compliance, staff also proposes Conditions of Certification **NOISE-1** and **NOISE-2**.

CEQA Impacts

Power plant noise is unique. A power plant operates as, essentially, a steady, continuous, broadband noise source, unlike the intermittent sounds that comprise the majority of the noise environment. As such, power plant noise contributes to, and becomes part of, the background noise level, or the sound heard when most intermittent noises cease. Where power plant noise is audible, it will tend to define the background noise level. For this reason, staff typically compares the projected power plant noise to the existing ambient background (L_{90}) noise levels at the affected sensitive receptors. If this comparison identifies a significant adverse impact, then feasible mitigation must be incorporated in the project to reduce or remove the impact.

In most cases, a power plant will be intended to operate around the clock for much of the year. Nighttime operation of a peaking power plant such as the PEC, though rare, could occasionally occur, which could annoy nearby residents. For residential receptors, staff evaluates project noise emissions by comparing them to the nighttime ambient background level; this assumes the potential for annoyance due to power plant noise is greatest at night when residents are trying to sleep. Nighttime ambient noise levels are typically lower than the daytime levels; differences in background noise levels of 5 to 10 dBA are common. Staff believes it is prudent to average the lowest nighttime hourly background noise level values to arrive at a reasonable baseline for comparison with the project's predicted noise level.

Adverse impacts, as defined in CEQA, can be detected by comparing predicted power plant noise levels to the ambient nighttime background noise levels at the nearest sensitive residential receptors (ML1, ML2 and ML3), as shown above.

Combining the ambient noise level of 42 dBA L_{90} (**Noise Table 3** above) with the project noise level of 49 dBA at ML1 will result in 50 dBA L_{90}, 8 dBA above the ambient. As described above (under Method and Threshold for Determining Significance), staff regards an increase of up to 5 dBA as a less than significant impact. An increase between 5 and 10 dBA should be considered adverse, but may be either significant or insignificant, depending on the particular circumstances of a case, such as the duration and frequency of the noise, the resulting noise level, and land use designation of the

affected receptor. As explained above, the applicant commits to implementing mitigation measures to bring the project's noise level into compliance with the local LORS. The applicant would be required to mitigate the above 50 dBA by 5 dBA to 45 dBA (see above). This is 3 dBA in excess of the above nighttime level of 42 dBA L_{90}. An increase of 3 dBA is barely noticeable and would not create annoyance. To ensure the applicant will comply with the above noise LORS, staff proposes Condition of Certification **NOISE -4**. With implementation of this condition of certification, staff can conclude that the project operational noise impact at ML1 would be less than significant.

Combining the ambient noise level of 39 dBA L_{90} (**Noise Table 3** above) with the project noise level of 58 dBA at ML2 will result in 58 dBA L_{90}, 19 dBA above the ambient. As explained above, the applicant is in the process of signing an agreement to relocate the residents to approximately 4000 feet north of the project site. As such, ML2 will no longer be considered a sensitive receptor. At the new location, the above predicted project noise level of 41 dBA would not likely cause annoyance. To ensure the relocation will occur and the project will not create significant adverse noise impact at the new location, staff proposes Condition of Certification **NOISE-5**.

Combining the ambient noise level of 41 dBA L_{90} (**Noise Table 3** above) with the project noise level of 42 dBA at ML3 will result in 45 dBA L_{90}, 4 dBA above the ambient. This increase could be noticeable but does not typically create annoyance.

With implementation of the proposed mitigations, the project operational noise level at the most sensitive receptors would be mitigated to a less than significant level. These mitigation measures also reduce the project's noise impact on the minority population in the project area to less than significant.

Tonal Noises

One possible source of annoyance would be strong tonal noises. Tonal noises are individual sounds (such as pure tones) that, while not louder than permissible levels, stand out in sound quality. The applicant plans to address overall noise in design, and to take appropriate measures, as necessary, to eliminate tonal noises as possible sources of annoyance (PEC 2006a, AFC § 5.12.3). To ensure that tonal noises do not cause annoyance, staff proposes Condition of Certification **NOISE-4**.

Linear Facilities

All water and gas piping will lie underground, and will be silent during operation. Noise effects from the electrical interconnection line typically do not extend beyond the right-of-way easement of the line, and will thus be inaudible to any receptors.

Vibration

Vibration from an operating power plant could be transmitted by two chief means; through the ground (groundborne vibration), and through the air (airborne vibration).

The operating components of a simple cycle power plant consist of high-speed gas turbines, compressors, and various pumps. All of these pieces of equipment must be carefully balanced in order to operate; permanent vibration sensors are attached to the turbines and generators. Gas turbine generator facilities using the GE LM6000 machine

have not resulted in ground or airborne vibration impacts and it is not anticipated that GE Energy's LMS100 technology would differ considerably in its ability to produce ground or airborne vibration. Energy Commission staff agrees with this estimate, and agrees with the applicant that groundborne vibration from the PEC will be undetectable by any likely receptor.

Airborne vibration (low frequency noise) can rattle windows and objects on shelves, and can rattle the walls of lightweight structures. The PEC's chief source of airborne vibration would be the gas turbines' exhaust. In a power plant such as the PEC, however, the exhaust must pass through the SCR modules and the stack silencers before it reaches the atmosphere; the SCRs act as efficient mufflers. The combination of SCR units and stack silencers makes it highly unlikely that the PEC would cause perceptible airborne vibration effects.

Worker Effects

The applicant has acknowledged the need to protect plant operating and maintenance workers from noise hazards, and has committed to comply with applicable LORS (PEC 2006a, AFC §§ 5.12.4.1, 5.12.4.2; Table 5.12-6). Signs would be posted in areas of the plant with noise levels exceeding 85 dBA (the level that OSHA recognizes as a threat to workers' hearing), and hearing protection would be required. To ensure that plant operation and maintenance workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-6**.

CUMULATIVE IMPACTS AND MITIGATION

Section 15130 of the CEQA Guidelines (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the project alone.

As described above, the 120 MW SPP is planned to be located on a site east of the PEC. This location is approximately 460 feet from ML1, about 1,600 feet from ML2, and approximately 1,300 feet from ML3 (URS 2006a, AFC § 5.12.3.4; Table 5.12-8) The PEC, in combination with the SPP, will result in increases in the project area ambient noise. **Noise Table 5** below, shows estimated noise levels from the individual operations of the two projects and their cumulative noise impacts at these monitoring locations during the nighttime hours.

NOISE Table 5
Cumulative Noise Impact (PEC plus SPP)

Receptor	Measured Ambient During Nighttime Hours, dBA L_{90}	PEC Generated Noise Level, dBA	SPP Generated Noise Level, dBA	Cumulative, dBA L_{90}	Change
ML1	42[1]	49	55	56	+14
ML2	39[2]	58	42	58	+19
ML3	41[2]	42	44	47	+6

Sources: PEC 2006a, AFC § 5.12.1.2, Tables 5.12-2, 5.12-3; URS 2006a, AFC § 5.12.3.4, Table 5.12-8
[1] Staff's calculations of average of four quietest consecutive hours of the nighttime
[2] Results of the hourly measurements between midnight and 2:40 a.m.

As shown in the table above, the cumulative noise would result in a 14 dBA increase in the ambient noise level at ML1. As explained above, the current residents at ML1 would be relocated or additional mitigation measures would be implemented in order to comply with the above identified noise LORS. To ensure compliance, staff proposes Condition of Certification **NOISE-4** below. Also, the above cumulative result is based on the assumption that both projects would be operating simultaneously during late night and early morning hours when L_{90} levels are lowest. Both of these are peaker projects and would likely be expected to operate mostly during day time. Therefore, it is anticipated that both of the projects would rarely operate simultaneously for long periods of time during nighttime hours. Thus, the above cumulative impact would likely cause less annoyance than expected.

As shown above, the cumulative noise would result in a 19 dBA increase in the ambient noise level at ML2. As explained above, the residents at ML2 will be relocated to approximately 4000 feet away from the project site. At this distance and with incorporation of the above mitigation measures, the cumulative noise level from these two projects would be substantially lower, likely lower than 45 dBA (see **Noise Table 5** above, and the above analysis under the heading "Operation Impacts and Mitigation", subheading "Compliance with LORS"). This level of noise is considered tolerable and would not likely create significant impact. To ensure the relocation and compliance with the LORS, staff proposes Condition of Certification **NOISE-5** below. At ML3, an increase of 6 dBA would result due to the cumulative impact. This increase is noticeable and could potentially cause annoyance. However, as explained above, because the simultaneous operation of both projects is expected to occur rarely during nighttime hours, the cumulative noise would likely cause less impact than expected. Therefore, staff considers this impact less than significant. The proposed Conditions of Certification **NOISE-1**, **NOISE-2** and **NOISE-4** would ensure this.

Other projects within the vicinity of the PEC include the CalPeak Power Project and the Wellhead Power Project. These are, however, existing projects and their noise impacts

have been accounted for in the above existing ambient noise measurements and therefore included in the above cumulative analysis. Staff is not aware of any other projects which, when combined with the PEC, would create significant direct cumulative noise impact in the project area.

In light of the above proposed mitigation measures and the following proposed conditions of certification, staff believes it is unlikely that the PEC, combined with other new noise producing developments, would produce significant cumulative noise impacts at the noise sensitive receptors including the minority population.

FACILITY CLOSURE

In the future, upon closure of the PEC, all operational noise from the project would cease, and no further adverse noise impacts from operation of the PEC would be possible. The remaining potential temporary noise source is the dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise would be similar to that caused by the original construction, it can be treated similarly. That is, noisy work could be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise LORS that were in existence at that time would apply. Applicable conditions of certification included in the Energy Commission decision would also apply unless modified.

CONCLUSIONS

Operation and construction of the PEC will likely result in noise levels exceeding the LORS and will likely result in significant impacts at the noise-sensitive residential receptors. However, incorporation of the requirements embodied in staff's proposed conditions of certification, and implementation of the applicant's proposed appropriate mitigation in the form of good design practice and inclusion of necessary project equipment, would ensure that all necessary mitigation would be employed to reduce the noise levels to those consistent with the LORS. Condition of Certification **NOISE-4** requires the applicant to comply with the noise LORS at ML1 whether this property remains a residential property or the residents are relocated. Condition of Certification **NOISE-5** requires the applicant to relocate the residents at ML2 to the location agreed upon between the applicant and the landowner of this property and to ensure compliance with the above LORS at this new location. The incorporation of these requirements would also reduce the noise impacts to less than significant.

Staff concludes that the PEC, if built and operated in conformance with the proposed conditions of certification below, would comply with all applicable noise and vibration LORS, and would produce no significant adverse noise impacts on people within the affected area including the minority population, either direct or cumulative.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 At least 15 days prior to the start of ground disturbance, the project owner shall notify all residents within one mile of the project site and one-half mile of the linear facilities, 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: Prior to ground disturbance, the project owner shall transmit to the Compliance Project Manager (CPM) a statement, signed by the project owner's project manager, stating that the above notification has been performed, and describing the method of that notification, verifying that the telephone number has been established and posted at the site, and giving that telephone number.

NOISE COMPLAINT PROCESS

NOISE-2 Throughout the construction and operation of the PEC, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints. The project owner or authorized agent shall:

- Use the Noise Complaint Resolution Form (below), or a 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 five days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form with the local jurisdiction and the CPM, documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 3-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is implemented.

NOISE-3 The project owner shall submit to the CPM for review and approval a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal-OSHA standards.

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

NOISE RESTRICTIONS

NOISE-4 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that operation of the project will not cause noise levels due to plant operation plus ambient, during the four quietest consecutive hours of the nighttime, to exceed an average of 45 dBA L_{50} measured near monitoring locations ML1 (approximately 1,900 feet northeast of the center of the project site) and ML3 (43405 West Panoche Road). If the residents living in the 5-Plex (near ML1) are relocated to a new location within one mile of the project site, the project shall ensure that its operations will not cause noise level due to plant operation plus ambient, during the four quietest consecutive hours of the nighttime, to exceed an average of 45 dBA L_{50} measured near the new location.

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

A. When the project first achieves a sustained output of 90 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at monitoring location ML1 or at a closer location acceptable to the CPM. If the residents at ML1 are relocated to a new location within one mile of the project site, the project owner shall conduct this survey near that location, at a location acceptable to the CPM. This survey during power plant operation shall also include measurement of one-third octave band sound pressure levels to ensure that no new pure-tone noise components have been caused by the project.

B. If, during the operating life of the project, the 5-Plex near monitoring location ML1 is converted back to a residential land use and becomes occupied with any residents, the project owner shall repeat this survey at ML1 or at a closer location acceptable to the CPM.

C. During the period of the first survey, the project owner shall conduct a short-term survey of noise at monitoring location ML3, or at a closer location acceptable to the CPM. The short-term noise measurements shall be conducted during every hour of the nighttime hours, from 10 p.m. to 7 a.m., during the period of the survey.

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

affected receptor locations to determine the presence of pure tones or other dominant sources of plant noise.

E. If the results from any of the above noise surveys indicate that the power plant noise level plus ambient (L_{50}) at the affected receptor sites exceeds the above value during the above specified time periods, mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

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

Verification: The first survey shall take place within 30 days of the project first achieving a sustained output of 90 percent or greater of rated capacity. If the second survey (the repeated survey at ML1) is needed (as described above), it shall take place prior to the 5-Plex being reoccupied. Within 15 days after completing each of the above surveys, the project owner shall submit a summary report of the survey to the CPM. Included in the survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limit, and a schedule, subject to CPM approval, for implementing these measures. When these measures are in place, the project owner shall repeat the noise survey.

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

NOISE-5 Prior to start of construction activities, the project owner shall relocate the residents on the property at ML2 to the location specified in the signed agreement between the applicant and the landowner of the property at ML2. The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that operation of the project will not cause noise levels due to plant operation plus ambient, during the four quietest consecutive hours of the nighttime, to exceed an average of 45 dBA L_{50} measured near this new location.

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

A. When the project first achieves a sustained output of 90 percent or greater of rated capacity, the project owner shall conduct a short-term survey of noise at this new location or at a closer location acceptable to the CPM. The short-term noise measurements shall be conducted during every hour of the nighttime hours, from 10 p.m. to 7 a.m., during the period of the survey. If, during the operating life of the project, any of the buildings at monitoring location ML2 are converted back to residential land use and become occupied with any residents, the project owner shall repeat this survey at ML2 or at a closer location acceptable to the CPM.

The character of the plant noise shall be evaluated at the affected receptor locations to determine the presence of pure tones or other dominant sources of plant noise.

B. If the results from any of the above noise surveys indicate that the power plant noise level plus ambient (L_{50}) at the affected receptor sites exceeds the above value during the above specified time period, mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

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

Verification: Prior to ground disturbance, the project owner shall transmit to the CPM a statement, signed by the project owner's project manager, stating that the residents on the property at ML2 have been relocated, and describing the new location and its distance to the project site.

The first noise survey shall take place within 30 days of the project first achieving a sustained output of 90 percent or greater of rated capacity. If the second survey is needed (as described above) it shall take place prior to the building(s) at ML2 being reoccupied. Within 15 days after completing each of the surveys, the project owner shall submit a summary report of the survey to the CPM. Included in the survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limit, and a schedule, subject to CPM approval, for implementing these measures. When these measures are in place, the project owner shall repeat the noise survey.

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

NOISE-6 Following the project first achieving a sustained output of 90 percent or greater of rated capacity, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility.

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

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

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

CONSTRUCTION TIME RESTRICTIONS

NOISE-7 Heavy equipment operation and noisy construction work relating to any project features shall be restricted to the times delineated below, unless a special permit has been issued by the County of Fresno:

Any day except Saturdays and Sundays	6 a.m. to 9 p.m.
Saturdays and Sundays	7 a.m. to 5 p.m.

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

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

EXHIBIT 1
Noise Complaint Resolution Form

Panoche Energy Center Project (06-AFC-5)
NOISE COMPLAINT LOG NUMBER _____ Complainant's name and address: Phone number: _____
Date complaint received: _____ Time complaint received: _____
Nature of noise complaint:
Definition of problem after investigation by plant personnel: Date complainant first contacted: _____
Initial noise levels at 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

County 2006a. Fresno County, California. *Noise Element of the Fresno County General Plan.*

County 2006b. Fresno County, California. *Noise Ordinance of the Fresno County Code*, Chapter 8.40.

PEC (Panoche Energy Center Project) 2006a. *Application for Certification*. Submitted to the California Energy Commission on August 2, 2006.

PEC (Panoche Energy Center Project) 2007a. *Data Responses*. Submitted to the California Energy Commission on January 9, 2007.

PEC (Panoche Energy Center Project) 2007d. *Data Responses Round 2*. Submitted to the California Energy Commission on March 1, 2007.

URS (URS Corporation/ R. Watkins) 2006a (tn: 38405). *Application for Certification for Starwood Power Project*. Rec'd on November 17, 2006.

URS (URS Corporation) 2007a. *E-mail sent from Maggie Fitzgerald of URS Corporation to Shahab Khoshmashrab of California Energy Commission*, Rec'd 04/24/07, at 4:03 P.M.

NOISE Appendix A
Fundamental Concepts of Community Noise

To describe noise environments and to assess impacts on noise sensitive area, a frequency weighting measure, which simulates human perception, is customarily used. It has been found that A-weighting of sound intensities best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. **NOISE Table A1** provides a description of technical terms related to noise.

Noise environments and consequences of human activities are usually well represented by an equivalent A-weighted sound level over a given time period (L_{eq}), or by average day and night A-weighted sound levels with a nighttime weighting of 10 dBA (L_{dn}). Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. Outdoor day-night sound levels vary over 50 dBA depending on the specific type of land use. Typical L_{dn} values might be 35 dBA for a wilderness area, 50 dBA for a small town or wooded residential area, 65 to 75 dBA for a major metropolis downtown (e.g., San Francisco), and 80 to 85 dBA near a freeway or airport. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be levels of noise adverse to public health.

Various environments can be characterized by noise levels that are generally considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding average daytime levels. The day-to-night difference in rural areas away from roads and other human activity can be considerably less. Areas with full-time human occupation that are subject to nighttime noise, which does not decrease relative to daytime levels, are often considered objectionable. Noise levels above 45 dBA at night can result in the onset of sleep interference effects. At 70 dBA, sleep interference effects become considerable (Effects of Noise on People, U.S. Environmental Protection Agency, December 31, 1971).

In order to help the reader understand the concept of noise in decibels (dBA), **NOISE Table A2** has been provided to illustrate common noises and their associated sound levels, in dBA.

NOISE Table A1
Definition of Some Technical Terms Related to Noise

Terms	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
L_{10}, L_{50}, & L_{90}	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L_{90} is generally taken as the background noise level.
Equivalent Noise Level, L_{eq}	The energy average A-weighted noise level during the Noise Level measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 4.8 decibels to levels in the evening from 7 p.m. to 10 p.m., and after addition of 10 decibels to sound levels in the night between 10 p.m. and 7 a.m.
Day-Night Level, L_{dn} or DNL	The Average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10 p.m. and 7 a.m.
Ambient Noise Level	The composite of noise from all sources, near and far. The normal or existing level of environmental noise at a given location (often used for an existing or pre-project noise condition for comparison study).
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Pure Tone	A pure tone is defined by the Model Community Noise Control Ordinance as existing if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the two contiguous bands by 5 decibels (dB) for center frequencies of 500 Hz and above, or by 8 dB for center frequencies between 160 Hz and 400 Hz, or by 15 dB for center frequencies less than or equal to 125 Hz.

Source: Guidelines for the Preparation and Content of Noise Elements of the General Plan, Model Community Noise Control Ordinance, California Department of Health Services 1976, 1977.

NOISE Table A2
Typical Environmental and Industry Sound Levels

Noise Source (at distance)	A-Weighted Sound Level in Decibels (dBA)	Noise Environment	Subjective Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		Very Loud
Very Loud Music	110	Rock Music Concert	
Pile Driver (50')	100		
Ambulance Siren (100')	90	Boiler Room	
Freight Cars (50')	85		
Pneumatic Drill (50')	80	Printing Press Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center Department Store/Office	
Light Traffic (100')	50	Private Business Office	
Large Transformer (200')	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing

Source: Handbook of Noise Measurement, Arnold P.G. Peterson, 1980

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 can be helpful in understanding the significance of human exposure to noise.

1. Except under special conditions, a change in sound level of one dB cannot be perceived.

2. Outside of the laboratory, a three dB change is considered a barely noticeable difference.

3. A change in level of at least five dB is required before any noticeable change in community response would be expected.

4. A 10 dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response. (Kryter, Karl D., The Effects of Noise on Man, 1970)

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: Architectural Acoustics, M. David Egan, 1988

Sound and Distance

Doubling the distance from a noise source reduces the sound pressure level by six dB.

Increasing the distance from a noise source 10 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:

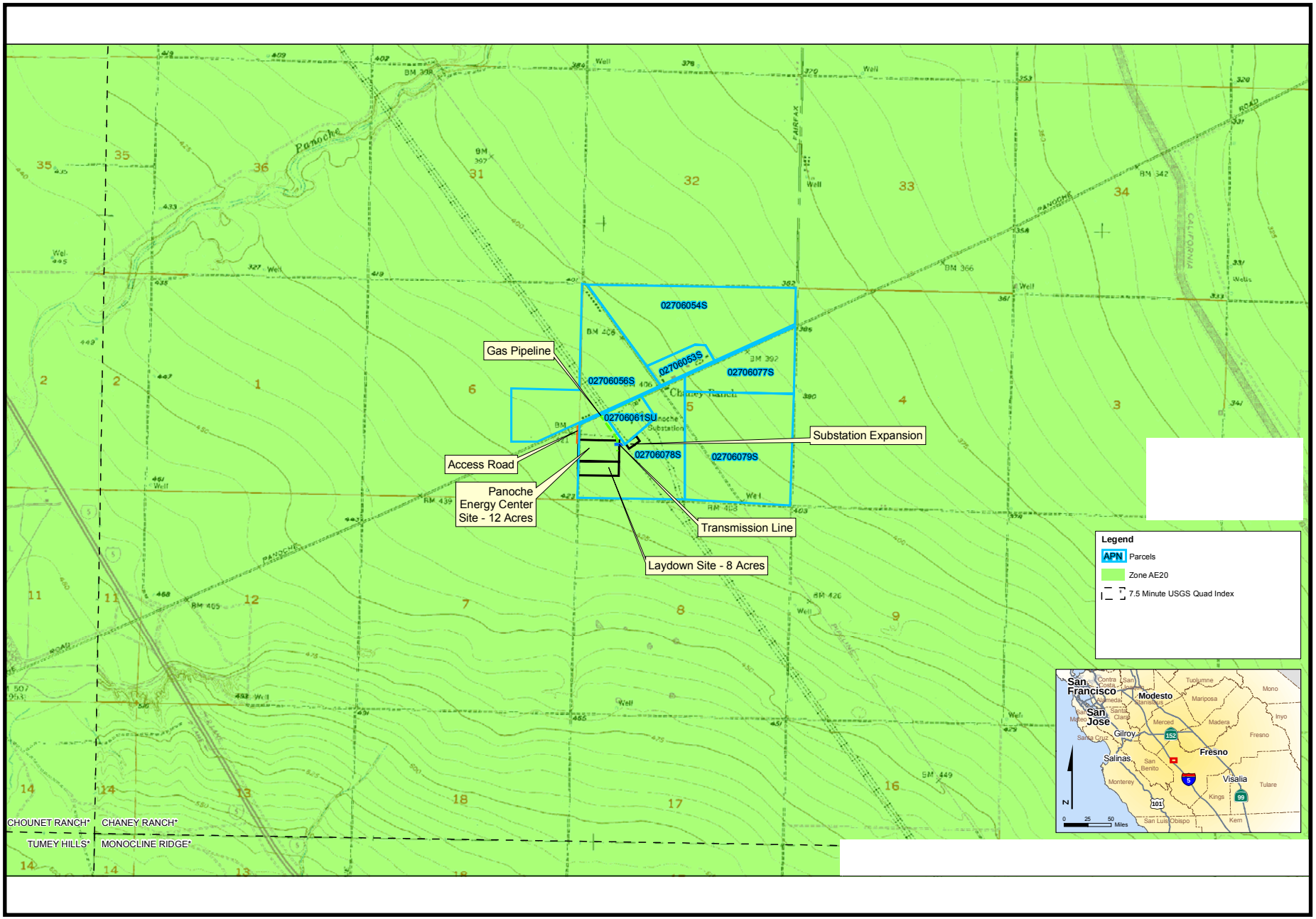
NOISE Table A4
OSHA Worker Noise Exposure Standards

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: 29 C.F.R. § 1910.

NOISE AND VIBRATION - FIGURE 1

Panoche Energy Center - Zoning Designations Surrounding Project Site

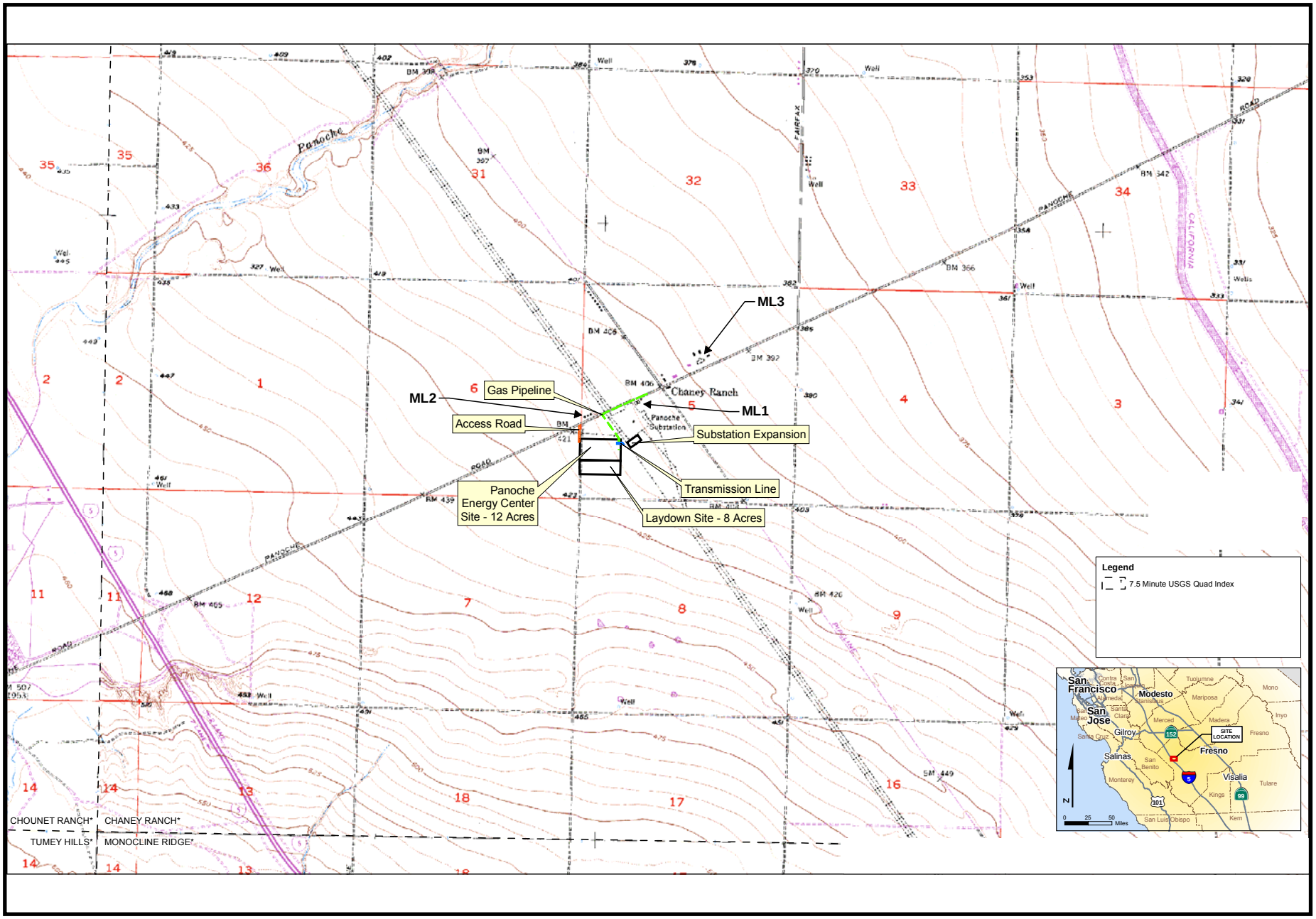


CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: AFC Figure 5.9-2

NOISE AND VIBRATION - FIGURE 2

Panoche Energy Center - Vicinity Map



CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: AFC Figure 5.12-1

PUBLIC HEALTH

Obed Odoemelam, Ph.D.

SUMMARY AND CONCLUSIONS

Staff has analyzed the potential public health risks from the toxic air pollutants associated with construction and operation of the proposed Panoche Energy Center (PEC) and does not expect that there would be any significant adverse cancer or short- or long-term health effects if the proposed conditions of certification in this section and the **Air Quality** section are implemented. The toxic pollutants (non-criteria pollutants) considered in this analysis are pollutants for which there are no established air quality standards. The potential for significant public health impacts from emission of the other group of pollutants for which there are specific air quality standards (criteria pollutants) is discussed in the **Air Quality** section with particular regard to those for which existing area levels exceed their respective air quality standards. While the analysis in this **Public Health** section shows that the project's toxic pollutants would not constitute a significant public hazard in the project area, staff finds it necessary to also consider the findings in the **Air Quality** section with regard to the criteria pollutants. The public health impacts of these pollutants should be considered insignificant only if the **Air Quality** staff concludes that the specified **Air Quality** conditions of certifications would be adequate to ensure that their operations-related emissions would be at levels that would ensure public exposure below the applicable standards.

INTRODUCTION

The purpose of this **Public Health** analysis is to determine if toxic emissions from the proposed Panoche Energy Center would have the potential to cause significant adverse public health impacts or violate standards for public health protection in the project area. Toxic pollutants (or non-criteria pollutants) are pollutants for which there are no specific air quality standards. The other pollutants for which there are such air quality standards are known as criteria pollutants. If potentially significant health impacts are identified for the non-criteria pollutants considered in this analysis, staff would evaluate mitigation measures to reduce such impacts to less than significant levels.

Although the emission and exposure levels for criteria air pollutants are addressed in the **Air Quality** section, staff has included **Attachment A** at the end of this **Public Health** section to provide specific information on the nature of their respective health effects. The discussion in the **Air Quality** section mainly focuses on the potential for above-standard exposure and the regulatory measures necessary to mitigate such exposures with particular emphasis on carbon monoxide, ozone, and particulate matter for which existing area levels exceed their respective air quality standards. Staff considers it is necessary to mitigate the impacts of these and the non-criteria pollutants to ensure overall public health protection when the project is operating. The impacts on public and worker health from accidental releases of hazardous materials are examined in the **Hazardous Materials Management** section while the health effects from electric and magnetic fields are addressed in the **Transmission Line Safety and Nuisance** section. Pollutants released from the project in wastewater streams are discussed in the

Soils and Water Resources section. Facility releases in the form of hazardous and non-hazardous wastes are addressed in the **Waste Management** section.

LAWS, ORDINANCES, REGULATION, AND STANDARDS

PUBLIC HEALTH Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal:	
Clean Air Act section 112 (42 U.S. Code section 7412)	Requires new sources which emit more than ten tons per year of any specified hazardous air pollutant (HAP) or more than 25 tons per year of any combination of HAPs to apply Maximum Achievable Control Technology (MACT).
State:	
California Health and Safety Code sections 39650 et seq.	These sections mandate the California Air Resources Board (CARB) and the Department of Health Services to establish safe exposure limits for toxic air pollutants and identify pertinent best available control technologies. They also require that the new source review rule for each air pollution control district include regulations that require new or modified procedures for controlling the emission of toxic air contaminants.
California Health and Safety Code section 41700	This section states that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property."
California Code of Regulations, Title 22, Section 60306	Requires that whenever a cooling system uses recycled water in conjunction with an air conditioning facility and a cooling tower that creates a mist that could come into contact with employees or members of the public, a drift eliminator shall be used and chlorine, or other, biocides shall be used to treat the cooling system re-circulating water to minimize the growth of Legionella and other micro-organisms.
Local:	
San Joaquin Valley Unified Air Pollution Control District Rule 2201	Requires safe exposure limits for Toxic Air Pollutants (TACs), use of best Available Control Technology (BACT) and New Sources Review (NSR).

ASSESSMENT OF IMPACTS

This section describes staff's method of analyzing the potential health impacts of toxic pollutants together with the criteria used to determine their significance.

METHOD OF ANALYSIS

The toxic emissions addressed in this **Public Health** section are those to which the public could be exposed during project construction and routine operation. If such toxic contaminants are released into the air or water, people may come into contact with them through inhalation, dermal contact, or ingestion via contaminated food or water.

The ambient air quality standards for the criteria pollutants such as ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide are set to ensure the safety of everyone including those with heightened sensitivity to the effects of environmental pollution in general. Since non-criteria pollutants do not have such standards, a process known as a health risk assessment is used to determine if people might be exposed to them at unhealthy levels. The risk assessment procedure consists of the following steps:

- Identification of the types and amounts of hazardous substances that a source could emit into the environment;
- Estimation of worst-case concentrations of project emissions into the environment using dispersion modeling;
- Estimation of the amounts of pollutants to which people could be exposed through inhalation, ingestion, and dermal contact; and
- Characterization of the potential health risks by comparing worst-case exposures to safe standards based on known health effects.

For PEC and other sources, a screening level risk assessment is initially performed using simplified assumptions intentionally biased toward protection of public health. That is, an analysis is designed that overestimates public health impacts from exposure to the emissions. In reality, it is likely that the actual risks from the project will be much lower than the risks estimated by the screening level assessment. This overestimation is accomplished by identifying conditions that would lead to the highest, or worst-case risks, and then assuming them in the study. The process involves the following:

- using the highest levels of pollutants that could be emitted from the source;
- assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
- using the type of air quality computer models which predict the greatest plausible impacts;
- calculating health risks at the location where the pollutant concentrations are estimated to be highest;
- using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses); and

- assuming that an individual's exposure to cancer-causing agents would occur over a 70-year lifetime.

A screening level risk assessment will, at a minimum, include the potential health effects from inhaling hazardous substances. Some facilities may also emit certain substances, which could present a health hazard from non-inhalation pathways of exposure (see California Air Pollution Control Officers Association (CAPCOA) 1993, Table III-5). When these substances are present in facility emissions, the screening level analysis is conducted to include the following additional exposure pathways: soil ingestion, dermal exposure, and mother's milk (CAPCOA 1993, p. III-19).

The risk assessment process addresses three categories of health impacts: acute (short-term) health effects, chronic (long-term) non-cancer effects, and cancer risk (also long-term). Acute health effects result from short-term (one-hour) exposure to relatively high concentrations of pollutants. Acute effects are temporary in nature, and include symptoms such as irritation of the eyes, skin, and respiratory tract.

Chronic health effects are those that result from long-term exposure to lower concentrations of pollutants. The exposure period is considered to be approximately from ten to one hundred percent of a lifetime (from seven to seventy years). Chronic health effects include reduced lung function and heart disease.

The analysis for non-cancer health effects compares the maximum project contaminant levels to safe levels called "reference exposure levels" or RELs. These are amounts of toxic substances to which even sensitive people can be exposed and suffer no adverse health effects (CAPCOA 1993, p. III-36). This means that such exposure limits would serve to protect such sensitive individuals as infants, school pupils, the aged, and people suffering from illnesses or diseases, which make them more susceptible to the effects of toxic substance exposure. The RELs are based on the most sensitive adverse health effects reported in the medical and toxicological literature, and include specific margins of safety, which address the uncertainties associated with inconclusive scientific and technical information available at the time of standard setting. They are, therefore, intended to provide a reasonable degree of protection against hazards that research has not yet identified. Each margin of safety is designed to prevent pollution levels that have been demonstrated to be harmful, as well as to prevent lower pollutant exposures that may pose an unacceptable risk of harm, even if the risk is not precisely identified as to nature or degree. Health protection can be expected if the estimated worst-case exposure is below the relevant reference exposure level. In such a case, an adequate margin of safety is assumed to exist between the predicted exposure and the estimated threshold for toxicity.

Exposure to multiple toxic substances may result in health effects that are equal to, less than, or greater than effects resulting from exposure to the individual chemicals. Only a small fraction of the thousands of potential combinations of chemicals have been tested for the health effects of combined exposures. In conformance with CAPCOA guidelines, the health risk assessment assumes that the effects of the individual substances are additive for a given organ system (CAPCOA 1993, p. III-37). In those cases where the actions may be synergistic (where the effects are greater than the sum), this approach may underestimate the health impact in question.

For carcinogenic substances, the health assessment considers the risk of developing cancer and conservatively includes the previously noted assumption that the individual would have continuous exposure over a 70-year lifetime. The risk that is calculated is not meant to project the actual expected incidence of cancer, but rather a theoretical upper-bound number based on worst-case assumptions.

Cancer risk is expressed in terms of chances per million of developing cancer and is a function of the maximum expected pollutant concentration, the probability that a particular pollutant will cause cancer (known as “potency factor”, and established by the California Office of Environmental Health Hazard Assessment), and the length of the exposure period. Cancer risks for individual carcinogens are added together to yield the total cancer risk from the source being considered. The conservative nature of the screening assumptions used means that actual cancer risks are likely to be considerably lower than those estimated.

The screening level analysis is performed to assess worst-case public health risks associated with the proposed project. If the screening analysis were to predict a risk of no significance, no further analysis would be necessary. However, if the risk were to be above the significance level, further analysis, using more realistic site-specific assumptions would be performed to obtain a more accurate estimate of the public health risk in question.

SIGNIFICANCE CRITERIA

Commission staff assesses the health effects of exposure to toxic emissions by first considering the impacts on the maximally exposed individual. This individual is the person hypothetically exposed to project emissions at a location where the highest ambient impacts were calculated using worst-case assumptions, as described above. If the potential risk to this individual is below established levels of significance, staff would consider the potential risk as also less than significant anywhere else in the project area. As described earlier, non-criteria pollutants are evaluated for short-term (acute) and long-term (chronic) non-cancer health effects, as well as cancer (long-term) health effects. The potential significance of project health impacts is determined separately for each of the three categories of health effects.

Acute and Chronic Non-Cancer Health Effects

Staff assesses the significance of non-cancer health effects by calculating a “hazard index” for the exposure being considered. A hazard index is a ratio obtained by comparing exposure from facility emissions to the reference (safe) exposure level for the toxicant. A ratio of less than one would signify a worst-case exposure below the safe level. The hazard indices for all toxic substances with the same types of health effect are added together to yield a total hazard index for the source being evaluated. This total hazard index is calculated separately for acute and chronic effects. A total hazard index of less than one indicates that the cumulative worst-case exposure would be within safe levels. Under these conditions, health protection would be assumed even for sensitive members of the population. In such a case, staff would assume that there would be no significant non-cancer public health impacts from project operations.

Cancer Risk

Staff relies upon regulations implementing the provisions of Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986 (Health & Safety Code, §§ 25249.5 et seq.) for guidance in establishing the level of significance for its assessed cancer risks. Title 22, California Code of Regulations, section 12703(b) states in this regard, that "the risk level which represents no significant risk shall be one which is calculated to result in one excess case of cancer in an exposed population of 100,000, assuming lifetime exposure." This risk level is equivalent to a cancer risk of ten in one million, or $10x10^{-6}$. An important distinction from the provisions in Proposition 65 is that the Proposition 65 significance level applies separately to each cancer-causing substance, whereas staff determines significance based on the total risk from all cancer-causing chemicals from the source in question. Thus, the manner in which the significance level is applied by staff is more conservative (health-protective) than with Proposition 65.

As noted earlier, the initial risk analysis for a project is normally performed at a screening level, which is designed to overstate actual risks, so that health protection can be ensured. When a screening analysis shows the cancer risks to be above the significance level, refined assumptions would likely result in a lower, more realistic risk estimate. If facility risk, based on refined assumptions, were to exceed the significance level of ten in one million, staff would require appropriate measures to reduce risk to less than significant. If, after all risk reduction measures have been considered, a refined analysis still identifies a cancer risk of greater than ten in one million, staff would deem such risk to be significant, and would not recommend project approval.

SETTING

This section describes the environment in the vicinity of the proposed project site from the public health perspective. Features of the natural environment, such as meteorology and terrain, affect the project's potential for causing impacts on public health. An emission plume from a facility may affect elevated areas before lower terrain areas, because of a reduced opportunity for atmospheric mixing. Consequently, areas of elevated terrain can often be subjected to increased pollutant impacts. Also, the types of land use near a site influences population density and, therefore, the number of individuals potentially exposed to the project's emissions. Additional factors affecting potential public health impacts include existing air quality and environmental site contamination.

SITE AND VICINITY DESCRIPTION

According to the information from the applicant, Panoche Energy Center, LLC (PEC 2006a, pp. 3-1, 3-2, 5.16-2 and 5.9-1 through 5.9-7), the proposed PEC site is a 12.8 acre parcel within a larger, 128-acre piece located approximately 50 miles west of the City of Fresno in unincorporated Fresno County. The area within 10 miles of the site is agricultural land with relatively few rural residences. The nearest communities, which include Mendota, El Porvenir, Firebaugh, and San Joaquin, are between 12 and 24 miles from the site.

The nearest of the area's few rural residences is located approximately 550 feet north of the northwest edge of the project property boundaries. The applicant (PEC 2006a, p

5.16-16, Figure 5.16-1) provided specific information identifying the sensitive receptor locations within a three-mile radius of the site together with their respective directions and distances from the site. Sensitive receptors locations are those housing sensitive individuals such as the elderly, school pupils and individuals with respiratory diseases who, as previously noted, are usually more sensitive to the effects of environmental pollutants than the general public. In most cases these locations would include schools, pre-schools, daycare centers, nursing homes, medical centers, hospitals, colleges, however, only eight residencies and one park were identified within this three-mile study area. Staff holds all projects to the same health standards, whether proposed for a major population center, with many sensitive receptors, or a sparsely populated area (as with the proposed project) with relatively few.

METEOROLOGY

Meteorological conditions, including wind speed, wind direction, and atmospheric stability, affect the extent to which pollutants are dispersed into ambient air as well as the direction of pollutant transport. This, in turn, affects the level of public exposure to emitted pollutants and associated health risks. When wind speeds are low and the atmosphere is stable, for example, dispersion is reduced and localized exposure may be increased.

The proposed project site is in an area of mild climate with relatively low precipitation, as it is separated from the rainier and cooler coastal regions by the Diablo and Coastal mountain ranges to the northwest, southeast, and west. This climate is strongly influenced by the large-scale warming and sinking of the air in the semi-permanent subtropical high-pressure center over the Pacific Ocean. This high-pressure system blocks out most mid-latitude storms except in the winter when most of the area's 11.9 inches of rainfall occurs. The site is at an elevation of 420 feet in a terrain that slopes gently downward to the north, northeast, and east towards the San Joaquin River 15 miles from the site. The yearly maximum temperature averages 76°F while the minimum averages 48°F.

Because of the area's winds of low speeds (with little seasonal variation), the atmosphere has a limited capacity to disperse the area's air contaminants from the points of generation to other locations. Strong atmospheric temperature inversions frequently occur especially in the late mornings and early afternoons. These inversions severely limit vertical air mixing and result in the buildup of air pollutants by restricting their movement from the ground level to the upper atmosphere out of the air basin.

Atmospheric stability is a measure of the turbulence that influences such pollutant dispersion. Mixing heights (the height above ground level below which the air is well mixed and in which pollutants can be effectively dispersed) are lower during the morning hours because of temperature inversions, which are followed by temperature increases in the warmer afternoons. Staff's **Air Quality** section presents a more detailed discussion of the area's meteorology as related to pollutant dispersion.

EXISTING AIR QUALITY

The proposed site is within the jurisdiction of San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). By examining average toxic concentration levels from

representative air monitoring sites in California with cancer risk factors specific to each contaminant, lifetime cancer risk can be calculated to provide a background risk level for inhalation of ambient air. For comparison purposes, it should be noted that the overall lifetime cancer risk for the average individual is about 1 in 4, or 250,000 in one million.

The toxic air monitoring station closest to the Panoche Energy Center is on First Street in Fresno, approximately 50 miles from the project site. Based on levels of toxic air contaminants measured at this monitoring station in 2000, the background cancer risk calculated for this location is 225 in one million (CARB 2001). The pollutants 1, 3-butadiene and benzene, emitted primarily from mobile sources, were the two highest contributors to risk and together accounted for over half of the total. The risk from 1, 3-butadiene was about 73 in one million, while the risk from benzene was about 68 in one million. Formaldehyde accounts for about 12 percent of the ambient cancer risk determined for Fresno, with a risk of about 26 in one million. Formaldehyde is emitted directly from vehicles and other combustion sources, such as the Western-Midway-Sunset Power Plant located approximately 70 miles away in Kern County.

The use of reformulated gasoline, beginning in the second quarter of 1996, as well as other toxics reduction measures, have led to a decrease of ambient levels of toxics and associated cancer risk during the past few years. For example, at the Fresno monitoring station, cancer risk was 497 in one million based on 1991 data and 314 in one million based on 1995 data.

The noted toxic pollutant-related background risk estimates can be compared with the normal background lifetime cancer risk (from all cancer causes) of one in four, or 250,000 in a million, as will be noted later. The potential risk from PEC and similar sources should best be assessed in the context of their potential addition to these background risk levels.

The criteria pollutant-related air quality for the project area is assessed in the **Air Quality** section by adding the existing levels (as measured at area monitoring stations), adding them to the project-related levels, and comparing the resulting levels with the applicable air quality standards. Public health protection would be ensured only through specific technical and administrative measures that ensure below-standard exposures when the project is operating. It is such a combination of measures that is addressed in the **Air Quality** section.

IMPACTS

POTENTIAL IMPACTS OF PROJECT'S NON-CRITERIA POLLUTANTS

The health impacts of the non-criteria pollutants of specific concern in this analysis can be assessed separately as construction-phase impacts and operational-phase impacts.

Construction Phase Impacts

Possible construction-phase health impacts, as noted by the applicant (PEC 2006a pp. 5.2-11 through 5.2-13, and Appendix 1), are those from human exposure to the windblown dust from site excavation and grading, and emissions from construction-

related equipment. The dust-related impacts may result from exposure to the dust itself as PM10, or PM 2.5, or exposure to any toxic contaminants that might be adsorbed on to it. As more fully discussed in the **Waste Management** section, results of the applicant's site contamination assessments (PEC 2006a, pp. 5.14-1 through 5.14-18, and Appendix U) showed no areas of possible chemical contamination from past agricultural or other uses. This means that particulate-related chemical exposures would be unlikely during the site preparation and project erection phases.

The applicant has specified the mitigation measures necessary to minimize construction-related fugitive dust as required by SJVUAPCD Rules 4201, 8021 8061, and 8071. The only soil-related construction impacts of potential significance would result from the possible impacts of PM10, or PM 2.5 as a criteria pollutant for the 16-month construction period. As mentioned earlier, the potential for significant impacts from criteria pollutants is assessed in the **Air Quality** section where the requirements for the identified mitigation measures are presented as specific conditions of certification.

The exhaust from diesel-fueled construction and other equipment has been established as a potent human carcinogen. Thus, construction-related emission levels should be regarded as possibly adding to the carcinogenic risk of specific concern in this analysis. The applicant, in Appendix U (PEC 2006a), presents the diesel emissions from the different types of equipment to be used in the construction phase. Staff considers the recommended control measures specified in **Air Quality** Condition of Certifications (AQ-SC3, and AQ-SC4) as adequate to minimize any cancer risk during the relatively short (16-month) construction period.

Operational Impacts

The main health risk from PEC operations would be associated with emissions from its combustion turbines, testing of the emergency diesel firewater pump engine, and the evaporative cooling tower. In addition to the toxic substances emitted from the cooling tower, there is specific concern that bacterial growth in the cooling tower could lead to potential health effects from human exposure. This is discussed below in the section on cooling tower operation and risk of Legionnaires' disease.

Public Health Table 1 lists the project's toxic emissions and shows how each contributes to the risk estimated from the health risk analysis. For example, the first row shows that oral exposure to acetaldehyde is not of concern but, if inhaled, may have cancer and chronic (long-term) non-cancer health effects, but not acute (short-term) effects.

As noted in a publication by the South Coast Air Quality Management District (SCAQMD 2000, p. 6), one property that distinguishes the air toxics of concern in this analysis from the criteria pollutants is that the impacts from air toxics tend to be highest in close proximity to the source and quickly drop off with distance. This means that the levels of PEC's air toxics would be highest in the immediate area and would decrease rapidly with distance. One purpose of this analysis, as previously noted, is to determine whether or not exposures to air toxics from PEC would be at levels of possible health significance as established using existing assessment methods.

The applicant's estimates of PEC's potential contribution to the area's carcinogenic and non-carcinogenic pollutants were obtained from a screening-level health risk assessment conducted according to procedures specified in the 1993 CAPCOA guidelines. The results from this assessment (summarized in staff's **Public Health Table 2**) were provided to staff along with documentation of the assumptions used (PEC 2006a pp. 5.16-2, through 5.16-12 and Appendix-O). This documentation included:

- 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 acceptable for use in this analysis, and has validated the applicant's findings with regard to the numerical public health risk estimates expressed either in terms of the hazard index for each non-carcinogenic pollutant, or a cancer risk for estimated levels of the carcinogenic pollutants. These analyses were conducted to establish the maximum 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.

PUBLIC HEALTH Table 1
Types of Health Impacts and Exposure Routes Attributed to Toxic Emissions

Substance	Oral Cancer	Oral Non-Cancer	Inhalation Cancer	Non-Cancer (Chronic)	Non-Cancer (Acute)
Acetaldehyde			✔	✔	
Acrolein				✔	✔
Ammonia				✔	✔
Arsenic	✔	✔	✔	✔	✔
Benzene			✔	✔	✔
1,3-Butadiene			✔	✔	
Cadmium		✔	✔	✔	
Chromium			✔	✔	
Copper				✔	✔
Ethylbenzene				✔	
Formaldehyde			✔	✔	✔
Hexane				✔	
Lead	✔	✔	✔	✔	
Mercury		✔		✔	✔
Naphthalene		✔		✔	
Nickel			✔	✔	✔
Polynuclear Aromatic Hydrocarbons (PAHs)	✔	✔	✔	✔	
Propylene				✔	
Propylene oxide			✔	✔	✔
Toluene				✔	✔
Xylene				✔	✔
Zinc				✔	

Source: Prepared by staff using reference exposure levels and cancer unit risks from CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993, SRP 1998, and Office of Environmental Health Hazard Assessment Air Toxics Hot Spots Program Risk Assessment Guidelines.

As shown in **Public Health Table 2**, the chronic hazard index for the maximally exposed individual is 0.026 while the maximum hazard index for acute effects is 0.051. These values are well below staff's significance criterion of 1.0, suggesting that the pollutants in questions are unlikely to pose a significant risk of chronic or acute non-cancer health effects anywhere in the project area.

PUBLIC HEALTH Table 2
PEC Operation Hazard/Risk

Type of Hazard/Risk	Hazard Index/Risk	Significance Level	Significant?
Acute Non-cancer	0.051	1.0	No
Chronic Non-cancer	0.0026	1.0	No
Individual Cancer	3.46×10^{-6} (a)	10.0×10^{-6}	No

Staff's summary of information from PEC 2006a pp. 5.16-9, 5.16-10 and Appendix O.
(a) Risk from normal project operations

The cancer risk to the maximally exposed individual from normal project operation for the Types of Hazards/Risks shown in **Table 1** is shown as 3.46 in a million, which is well below staff's significance criterion of 10 in one million for this screening level assessment. Thus, project-related cancer risk from routine operations would be less than significant for all individuals in the project area. Staff notes that the maximum risks from the assessed turbines and cooling towers occur at different locations, so adding these risk estimates together as done in this analysis further adds to the conservatism in the assessment process.

The conservatism in these assessments is further reflected in the noted fact that (a) the individual considered is assumed to be exposed at the highest possible levels to all the carcinogenic pollutants from the project for a 70-year lifetime, (b) all the carcinogens are assumed to be equally potent in humans and experimental animals, even when their cancer-inducing abilities have not been established in humans, and (c) humans are assumed to be as susceptible as the most sensitive experimental animal, despite knowledge that cancer potencies often differ between humans and experimental animals. Only a relatively few of the many environmental chemicals identified so far as capable of inducing cancer in animals have been shown to also cause cancer in humans.

Cooling Tower-Related Risk of Legionnaires' disease

Legionella is a bacterium that is ubiquitous in natural aquatic environments and is also widely distributed in man-made water systems. It is the principal cause of legionellosis, otherwise known as Legionnaires' disease, which is similar to pneumonia. Transmission to people results mainly from inhalation or aspiration of aerosolized contaminated water. Untreated or inadequately treated cooling systems, such as industrial cooling towers and building heating, ventilating, and air conditioning systems, have been correlated with outbreaks of legionellosis, since cooling water systems and their components can amplify and disseminate aerosols containing Legionella.

The State of California regulates recycled water that is used for cooling towers operations according to requirements in Title 22, Section 60303, California Code of Regulations. These requirements mandate the use of chlorine or other biocides to an extent necessary to minimize the growth of Legionella and other microorganisms.

Legionella can grow symbiotically with other bacteria and can infect protozoan hosts. This provides Legionella with protection from adverse environmental conditions, including making it more resistant to water treatment with chlorine, biocides, and other

disinfectants. Staff notes that most cooling tower water treatment programs are designed to minimize scale, corrosion, and biofouling, and not necessarily to control Legionella.

Effective mitigation measures should include a cleaning and maintenance program to minimize the accumulation of bacteria, algae, and protozoa that may contribute to nutritional needs of Legionella. The American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE 1998) emphasizes the need for such programs in its specifications for Legionellosis prevention. Also, the Cooling Tower Institute has issued Guidelines for the Best Practices for Control of Legionella (CTI 2000). Preventive maintenance includes having effective drift eliminators, periodically cleaning the system as appropriate, maintaining mechanical components in working order, and maintaining an effective water treatment program with appropriate biocide concentrations.

Staff's recommended Condition of Certification **PUBLIC HEALTH-1** is intended to ensure the effective maintenance and bactericidal action necessary during the operation of PEC's cooling tower regardless of the source of the cooling water. This condition would specifically require the project owner to prepare and implement a cooling water management plan to ensure that bacterial growth is kept to a minimum in the cooling tower. With the use of an aggressive antibacterial program, coupled with routine monitoring and biofilm removal, the chances of Legionella growth and dispersal would be reduced to less than significant.

CUMULATIVE IMPACTS

As previously noted, the maximum impact location would be the spot where pollutant concentrations for the proposed PEC would theoretically be highest. Even at this hypothetical location, staff does not expect any significant change in lifetime risk to any person, given the calculated incremental cancer risk of 3.46 in one million, which staff regards as not potentially contributing significantly to the previously noted average lifetime individual cancer risk of 250,000 in one million. Modeled facility-related residential risks are much lower for more distant locations. Given the previously noted conservatism in the utilized calculation method, the actual risks would likely be much smaller. Therefore, staff does not consider the incremental risk estimate for PEC's operation as pointing to a potentially significant contribution to the area's cancer risk.

The worst-case long-term non-cancer health impact from the project (represented as a chronic hazard index of 0.0026) is well below staff's significance level of 1.0 at the location of maximum impact. At this level, staff does not expect any cumulative health impacts to be significant. As with cancer risk, long-term non-cancer hazard risk would be lower at all other locations and cumulative impacts at other locations would also be less than significant.

Additionally, implementation of staff's proposed condition of certification to reduce the likelihood of Legionella growth would ensure that the risk of Legionella growth and dispersion is reduced to levels of insignificance and therefore not contributing to a cumulative impact.

Due to the lack of significant public health impacts, the environmental justice populations identified in the **Socioeconomics** section of this PSA would not suffer disproportionate impacts.

COMPLIANCE WITH LORS

The toxic pollutant-related cancer and non-cancer risks from PEC operation reflect the effectiveness of control measures (including the use of cleaner-burning natural gas, and an oxidation catalyst which reduces hazardous air pollutant emissions) proposed by the applicant. Since these risk estimates are much below the significance levels in the applicable LORS, staff concludes that the related operational plan would comply with these LORS.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has not received any agency or public comments on the public health aspects of the proposed project.

CONCLUSIONS AND RECOMMENDATIONS

Staff has determined that the toxic air emissions from the construction and operation of the proposed natural gas-burning PEC are at levels that do not require mitigation beyond the specific emission control measures noted above. Implementation of staff's proposed condition of certification to reduce the likelihood of Legionella growth would ensure that the risk of Legionella growth and dispersion is reduced to levels of insignificance. If the proposed project is approved, staff recommends the following Condition of Certification to address the risk from Legionella in the cooling tower.

The conditions for ensuring compliance with all applicable air quality standards are specified in the **Air Quality** section for the area's criteria pollutants.

PROPOSED CONDITION OF CERTIFICATION

PUBLIC HEALTH-1 The project owner shall develop and implement a Cooling Water Management Plan to ensure that the potential for bacterial growth in cooling water is kept to a minimum. The Plan shall be consistent with either Staff's "Cooling Water Management Program Guidelines" or with the Cooling Technology Institute's "Best Practices for Control of Legionella" guidelines.

VERIFICATION: At least 30 days prior to the commencement of cooling tower operations, the Cooling Water Management Plan shall be provided to the CPM for review and approval.

REFERENCES

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SRP (Scientific Review Panel on Toxic Air Contaminants) 1998. Findings of the Scientific Review Panel on the Report on Diesel Exhaust as adopted at the Panel's April 22, 1998 Meeting.

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ATTACHMENT A
CRITERIA POLLUTANTS

OZONE (O_3)

Ozone is not directly emitted from specific sources but is formed when reactive organic compounds (VOCs) interact with nitrogen oxides in the presence of sunlight. Heat speeds up the reaction, typically leading to higher concentrations in the relatively hot summer months. Ozone is a colorless, reactive gas with oxidative properties that allow for tissue damage in the exposed individual. The effects of such damage could be experienced as respiratory irritation that could interfere with normal respiratory function. Ozone can also damage plants and other materials susceptible to oxidative damage.

The U.S. EPA revised its federal ozone standard on July 18, 1997 (62 Fed. Reg. 38856), based on health studies that had became available since the standard was last revised in 1979. These new studies showed that adverse health effects could occur at ambient concentrations much lower than reflected in the previous standard, which was based on acute health effects experienced during heavy exercise. In proposing the new standard, the EPA identified specific health effects known to have been caused by short-term exposures (of one to three hours) and prolonged exposure (of six to eight hours) (61 Fed. Reg. 65719). However, a 1999 federal court ruling blocked implementation of the ozone 8-hour standard, which is yet to be implemented.

Acute health effects from short-term exposures include a transient reduction in pulmonary function, and transient respiratory symptoms including cough, throat irritation, chest pain, nausea, and shortness of breath with associated effects on exercise performance. Other health effects of short-term or prolonged O_3 exposures include increased airway responsiveness (which predisposes the individual to bronchoconstriction induced by external stimuli such as pollen and dust), susceptibility to respiratory infection (through impairment of lung defense mechanisms), increased hospital admissions and emergency room visits, and transient pulmonary inflammation.

Generally, groups considered especially sensitive to the effects of air pollution include persons with existing respiratory diseases, children, pregnant women, and the elderly. However, controlled exposure data on people in clinical settings have indicated that the population at greatest risk of acute effects from ozone exposures as children and adults engaged in physical exercise. Children are most at risk because they are active outside, playing and exercising, during summer when ozone levels are highest. Adults who are outdoors and engaging in heavy exertion in the summer months are also among the individuals most at risk. This happens because such exertion increases the amount of O_3 entering the airways and can cause O_3 to penetrate to peripheral regions of the lung where lung tissue is more likely to be damaged. These individuals, as well as those with respiratory illnesses, such as asthma, can experience a reduction in lung function and increased respiratory symptoms, such as chest pain and cough, when exposed to relatively low ozone levels during periods of moderate exertion.

CARBON MONOXIDE (CO)

Carbon monoxide is a colorless, odorless gas, which is a product of inefficient combustion. It does not persist in the atmosphere, being quickly converted to carbon dioxide. However, it can reach high levels in localized areas, or "hot spots".

CO reduces the oxygen carrying capacity of the blood, thereby disrupting the delivery of oxygen to the body's organs and tissues. Persons sensitive to the effects of carbon monoxide include those whose oxygen supply or delivery is already compromised. Thus, groups potentially at risk to carbon monoxide exposure include persons with coronary artery disease, congestive heart failure, obstructive lung disease, vascular disease, and anemia, the elderly, newborn infants, and fetuses (CARB 1989, p. 9). In particular, people with coronary artery disease were found to be especially at risk from carbon monoxide exposure (CARB 1989, p. 9). Tests conducted on patients with confirmed coronary artery disease indicated that exposure to low levels of carbon monoxide during exercise can produce significant cardiac effects. These effects include chest pain (angina) and electrocardiographic changes indicative of effects on the heart muscle (CARB 1989, p. 6). Such changes can limit the ability of patients with coronary artery disease to exert themselves even moderately. Therefore, the statewide carbon monoxide one-hour and eight-hour standards were adopted in part to prevent aggravation of chest pain. Additionally, however, the standards are intended to prevent decreased exercise tolerance in persons with peripheral vascular disease and lung disease, impaired central nervous system functions, and effects on the fetus (Cal. Code Regs. Tit. 17, sec. 70200).

PARTICULATE MATTER (PM)

Particulate matter is a generic term for particles of various substances, which occur as either liquid droplets or small solids of a wide range of sizes. Particles with the most potential to adversely affect human health are those less than 10 micrometers (millionths of a meter) in diameter (known as PM10), which may be inhaled and deposited within the deep portions of the lung (PM10). PM may originate from anthropogenic or natural sources such as stationary or mobile combustion sources or windblown dust. Particles may be emitted directly to the atmosphere or result from the physical and chemical transformation of gaseous emissions such as sulfur oxides, nitrogen oxides, and volatile organic compounds. PM10 may be made up of elements such as carbon, lead, and nickel; compounds such as nitrates, organics, and sulfates; and complex mixtures such as diesel exhaust and soil fragments. The size, chemical composition, and concentration of ambient PM10 can vary considerably from area to area and from season to season within the same area.

PM10 can be grouped into two general sizes of particles, fine and coarse, which differ in formation mechanisms, chemical composition, sources, and potential health effects. Fine-mode particles are those with a diameter of 2.5 micrometers or less (PM2.5), while the coarse-mode fraction of PM consists of particles ranging from 10 micrometers down to 2.5 micrometers in diameter.

Coarse-mode PM10 is formed by crushing, grinding, and abrasion of surfaces, and in the course of reducing large pieces of materials to smaller pieces. Coarse particles

consist mainly of soil dust containing oxides of silicon, aluminum, calcium, and iron; as well as fly ash, particles from tires, pollen, spores, and plant and insect fragments. Coarse particles normally have shorter lifetimes (minutes to hours) and only travel over short distances (of less than tens of kilometers). They tend to be unevenly distributed across urban areas and have more localized effects than the finer particles.

PM2.5 is derived both from combustion by-products, which have volatilized and condensed to form primary PM2.5, and from precursor gases reacting in the atmosphere to form secondary PM2.5. Components include nitrates, organic compounds, sulfates, ammonium compounds, and trace elements (including metals) as well as elemental carbon such as soot. Major sources of PM2.5 are fossil fuel combustion by electric utilities, industry and motor vehicles, vegetation burning, and the smelting or other processing of metals. Dry deposition of fine mode particles is slow allowing such particles to often exist for long periods of time (of from days to weeks) in the atmosphere and travel hundreds to thousands of kilometers. They tend to be uniformly distributed over urban areas and larger regions and are removed from the atmosphere primarily by forming cloud droplets and falling out within raindrops.

The health effects of PM10 from any given source usually depend on the toxicity of its constituent pollutants. The size of the inhaled material usually determines where it is deposited in the respiratory system. Coarse particles are deposited most readily in the nose and throat area while the finer particles are more likely to be deposited within the bronchial tubes and air sacs, with the greatest percentage deposited in the air sacs. Until recently, PM10 particles had been considered to be the major fraction of airborne particulates responsible for various adverse health effects. The PM10 fraction is known to be capable of penetrating the thoracic and alveolar regions of the human and animal lungs. The PM2.5 fraction, however, was found to pose a significantly higher risk for health. This is due to their size and associated deposition and retention characteristics in the respiratory tract, enabling it to penetrate and deposit within the deeper alveolar regions of the lung. The following aspects of PM2.5 deposition all contribute to the more serious health effects attributed to smaller particles:

- The deposition of PM2.5 favors the periphery of the lungs, which is especially vulnerable to injury for anatomical reasons.
- Clearance of the PM2.5 from within the deeper reaches of the lungs is a much slower process than from the upper regions. Consequently, the residence time is longer, implying longer exposure, and hence greater risk.
- The human anatomy further allows the penetration of the superficial tissues by PM2.5 and entry into the bodily circulation without much effort in the periphery of the lungs.

Many epidemiological studies have shown exposure to particulate matter capable of inducing a variety of health effects, including premature death, aggravation of respiratory and cardiovascular disease, changes in lung function and increases in existing respiratory symptoms, effects on lung tissue structure, and impacts on the body's respiratory defense mechanisms. The underlying biological mechanisms are still poorly understood. Based on their review of a number of these epidemiological studies (as published after 1987 when the federal standards were revised), together with

suggestion of PM2.5 concentrations as a more reliable surrogate for the health impacts of the finer fraction of PM than PM10, the U.S. EPA concluded that the then-current standards were not sufficiently stringent to protect against significant effects in exposed humans. Therefore, federal PM standards were revised on July 18, 1997 (62 Fed. Reg. 38652) to add new annual and 24-hour PM2.5 standards to the existing annual and 24-hour PM10 standards. Taken together, these new standards were meant to provide additional protection against a wide range of PM-related health effects, including premature death, increased hospital admissions and emergency room visits, primarily among sensitive individuals such as the elderly, children and individuals with cardiopulmonary diseases such as asthma. Other impacts include decreased lung function (particularly in children and asthmatics), and alterations in lung tissue and structure.

California has also had 24-hour and annual standards for PM10 (CARB 1982, pp. 81, 84). These studies were aimed at establishing the PM10 levels capable of inducing asthma, premature death and bronchitis-related symptoms. They were set to protect against such impacts in the general population as well as sensitive individuals such as patients with respiratory disease, declines in pulmonary function, especially as related to children (Tit. 17, Cal. Code Regs. §70200). These standards were set to be more stringent than the federal standard, which the CARB regarded as inadequate for the protection desired (CARB 1991, p. 26).

On June 20, 2002, the CARB approved the adoption of a lower annual state standard for PM10, as well as a new annual standard for PM2.5 (CARB 2002). The new standards took effect on July 5, 2003. The 24-hour PM10 standard was not changed. The standards were established to prevent excess death, illnesses such as respiratory symptoms, bronchitis, asthma exacerbation, and cardiac disease, and restrictions in activity from short- and long-term exposures (Title 17, Cal. Code Regs. §70200).

NITROGEN DIOXIDE (NO_2)

Nitrogen dioxide is formed either directly or indirectly when oxygen and nitrogen in the air combine together during the combustion. It is a relatively insoluble gas, which can penetrate deep into the lungs, its principal site of toxicity. Its toxicity is thought to be due to its capacity to initiate free radical-mediated reactions while oxidizing cellular proteins and other biomolecules (CARB 1992, Appendix A, p. 4).

Sub lethal exposures in animals usually produce inflammations and varying degrees of tissue injury characteristic of oxidant damage (Evans in CARB 1992, Appendix A, and p 5). The changes produced by low-level acute or sub chronic exposures appear to be reversible when the animal study subject is allowed to recover in clean air.
Health effects of particular concern in relation to low-level nitrogen dioxide exposure include: (1) effects of acute exposure on some asthmatics and possibly on some persons with chronic bronchitis, (2) effects on respiratory tract defenses against infection, (3) effects on the immune system, (4) initiation or facilitation of the development of chronic lung disease, and (5) interaction with other pollutants (CARB 1992, Appendix A, p. 5).

Several groups, which may be especially susceptible to nitrogen dioxide-related health effects have been identified from human studies (CARB 1992, Appendix A, and p. 3). These include asthmatics, persons with chronic bronchitis, infants and young children, cystic fibrosis and cancer patients, people with immune deficiencies, and the elderly.

Studies involving brief, controlled exposures on sensitive individuals have shown an increase in bronchial reactivity or airway responsiveness of some asthmatics, as well as decreased lung function in some patients with chronic obstructive lung disease (CARB 1992, Appendix A, p. 2). In general, bronchial hyper reactivity (an increased tendency of the airways to constrict) is markedly greater in asthmatics than in non-asthmatics upon exposure to initiating respiratory irritants (CARB 1992a, p. 107). At exposure concentrations of specific relevance to the current one-hour ambient standard, there appears to be little, if any, effect on respiratory symptoms of asthmatics (CARB 1992a, p. 108).

SULFUR DIOXIDE (SO_2)

Sulfur dioxide is formed when any sulfur-containing fuel is burned. SO_2 is highly soluble and consequently absorbed in the moist passages of the upper respiratory system. Exposure to sulfur dioxide can lead to changes in lung cell structure and function that adversely affect a major lung defense mechanism known as mucociliary transport. This mechanism functions by trapping particles in mucus in the lung and sweeping them out via the cilia (fine hair-like structures) also in the lung. Slowed mucociliary transport is frequently associated with chronic bronchitis.

Exposure to sulfur dioxide can produce both short- and long-term health effects. Therefore, California has established sulfur dioxide standards to reflect both short- and long-term exposure concerns. Based on controlled exposure studies of human volunteers, investigators have found that asthmatics comprise the group most susceptible to adverse health effects from exposure to sulfur dioxide (CARB 1994, p. V-1).

The primary short-term effect is bronchoconstriction, a narrowing of the airways, which results in labored breathing, wheezing, and coughing. The short-term (one-hour) standard is based on bronchoconstriction and associated symptoms (such as wheezing and shortness of breath) in asthmatics and is designed to protect against adverse effects from five to ten minute exposures. In the opinion of the California Office of Environmental Health Hazard Assessment, the short-term ambient standard is likely to afford adequate protection to asthmatics engaged in short periods of vigorous activity (CARB 1994, Appendix A, p. 16).

Longer-term exposure is associated with increased incidence of respiratory symptoms (such as coughing and wheezing) or respiratory disease, decreases in pulmonary function, and an increased risk of premature mortality (CARB 1991a, p. 12). The long-term (24-hour) standard is based upon increased incidence of respiratory disease and premature mortality. The standard includes a margin of safety based on epidemiological studies, which have shown adverse respiratory effects at levels slightly above the standard. Some of the studies indicate a sulfur dioxide threshold for effects, suggesting

that no significant effects are expected from exposures to concentrations at the state standard (Ibid.).

ATTACHMENT A - REFERENCES

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SOCIOECONOMICS

Joseph Diamond Ph. D.

SUMMARY OF CONCLUSIONS

Staff has determined that the 400 MW Panoche Energy Center would not cause a significant adverse direct or cumulative socioeconomic impact on the area's housing, schools, police, emergency services, hospitals, and parks and recreation because most of the construction and operation workforce resides within the local or regional labor market area. Public benefits from the project include capital costs, construction and operation payroll, property taxes and sales taxes, and the value of purchased materials and supplies.

INTRODUCTION

This California Energy Commission staff socioeconomics impact analysis evaluated the project induced changes on community services and/or infrastructure, and related community issues such as Environmental Justice (EJ). Staff also discussed the potential impacts from project construction and operation.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

CALIFORNIA GOVERNMENT CODE, SECTIONS 65996-65997

These sections include provisions for school district levies against development projects. As Amended by Senate Bill (SB) 50 (Stats. 1998, ch. 407, sec. 23), these sections state that except for those fees established under Education Code 17620, public agencies at the state level may not impose fees, charges, or other financial requirements to offset the cost for school facilities.

SETTING

The affected area for socioeconomics as defined by the applicant for the Panoche Energy Center (PEC) in the Application for Certification (AFC), and considered by staff, is the four county area surrounding the project, which would be located on west Panoche Road, about 2.2 miles east of Interstate 5, in the unincorporated northwest part of Fresno County.

Research has shown that construction workers will commute as much as two hours one-way from their communities rather than relocate (Electric Power Research Institute 1982). Staff agrees with the applicant's conclusion that during construction most workers would potentially be drawn from Fresno, Madera, Tulare, and Kings Counties and if non-local contractors' staff workers are required for the project they would relocate in hotels and motels during construction and return home for the weekends (PEC 2006a and PEC 2007a). Therefore, staff utilized this labor market area for its evaluation of construction worker availability and community services and infrastructure impacts from the PEC construction.

Fresno County was used as the study area by staff in identifying fiscal and non-fiscal (private sector) benefits and other potential socioeconomic impacts from the PEC.

DEMOGRAPHIC SCREENING

The purpose of an environmental justice screening analysis is to determine whether a below poverty level and/or minority population exists within the potentially affected area of the proposed site. Staff conducted the demographic screening in accordance with the "Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis" (Guidance Document) (EPA 1998). People of color populations, as defined by this Guidance Document, are identified where either:

- The minority population of the affected area is greater than 50%of the affected area's general population; or
- The minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.
- One or more census blocks in the affected area have a minority population greater than 50%.

In 1997, the President's Council on Environmental Quality issued Environmental Justice Guidance that defines minority as individuals who are members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander; Black not of Hispanic origin; or Hispanic. Low-income populations are identified with the annual statistical poverty thresholds from the Bureau of the Census's Current Population Reports, Series P-60 on Income and Poverty (OMB 1978).

Staff has reviewed Census 2000 information that shows the minority population by census block (the smallest geographic unit for which the Census Bureau collects and tabulates data) is 97.84% and 10%, which exceeds staff's threshold of greater than 50% within a six-mile and one-mile radius of the proposed PEC (see **SOCIOECONOMICS Figure 1**). Census 2000 by census block group (a combination of census blocks and subdivision of a census tract) information shows that the below poverty population is 23.5%within the six-mile radius and 23.5% within the one-mile radius. Poverty status excludes institutionalized people, people in military quarters, people in college dormitories, and unrelated individuals under 15 years old.

ASSESSMENT OF IMPACTS

Staff reviewed the PEC socioeconomic section of the AFC and other socioeconomic data. Staff used the socioeconomic data provided and referenced from various governmental agencies, trade associations and its own independent analysis to form the following socioeconomic analysis and conclusions.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project may have a significant effect on population, housing and public services if the project will:

- induce substantial population growth in an area, either directly or indirectly;
- displace substantial numbers of people and/or existing housing, necessitating the construction of replacement housing elsewhere; or
- adversely impact acceptable levels of service for fire and police protection, schools, parks and recreation, and other public facilities.

A socioeconomic analysis looks at beneficial impacts on local finances from property and sales taxes as well as potential adverse impacts on public services. In order to determine if a project would have any significant impacts, staff analyzes whether the current status of these community services and capacities can absorb the project related impacts in each of these areas. If the project's impacts could appreciably strain or degrade these services, staff considers this to be a significant adverse impact and would propose mitigation. A project's property taxes, sales tax or local school impact fees or development fees can help local governments to augment public services needed to project needs.

In this analysis, staff used fixed percentage criteria for environmental justice in evaluating potential impacts. For environmental justice, staff uses a threshold of greater than 50% for minority/below poverty population as a subset of the total population in the local area. Criteria for subject areas such as utilities, fire protection, water use and wastewater disposal are analyzed in other sections of this staff assessment. Please see the **Soils and Water**, **Reliability**, **Worker Safety and Fire Protection** and **Waste Management** sections of this document. Education impacts are subjectively determined but are moot, as described later. Impacts on housing, parks and recreation, medical services, law enforcement, parks and recreation, and cumulative impacts are based on subjective judgments or input from local and state agencies. Substantial employment of people who come from regions outside the study area has the potential to result in significant adverse socioeconomic impacts.

DIRECT/INDIRECT/INDUCED IMPACTS

Staff reviewed the PEC AFC, Vol. I, Socioeconomics section (PEC 2006a and PEC 2007a). Based on staff's use of the socioeconomic data provided and referenced from governmental agencies, trade associations and staff's independent analysis, staff completed the following socioeconomic analysis and conclusions.

The Impact Analysis for Planning (IMPLAN) model (an input-output model), used by the applicant to estimate employment impacts from the PEC on the study area, is 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 California and the U.S. 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) IMPLAN multipliers were used to calculate direct, indirect, and induced jobs and expenditures in the regional economy. [1]

Population and Employment

The 2000 U.S. Census shows that California had a total population of 33,871,648, with minority (non-white and white-Hispanic) population of 18,054,858 (53%), and a white population of 15,816,790 or (46.7%). Fresno County had a total population of 865,620 in 2004 which is an increase of 8% from 799,407 in 2000 (PEC 2006a and California Department of Finance 2000). By 2010, projections show a California population of 38,067,134, and 1,001,100 residents in Fresno County (PEC 2006a). The applicant has stated that the construction workforce will come from a two-hour commute which would include first Fresno, Madera, Tulare, and Kings Counties. The operations workforce would come entirely from Fresno County (PEC 2006a). There would be little induced population growth and no displacement of population by the PEC. Staff concurs with the applicant's conclusions.

The unemployment rate for the Fresno County was 8% in June 2006 (not seasonally adjusted). This is not full employment for Fresno County. Full employment has been defined as 4 to 5% unemployment over the last few decades. For California in June 2006, the unemployment rate was 4.9% (CAEDD 2006a). Given the large number of workers in the trades noted in **SOCIOECONOMICS Table 1,** staff accepts the applicant's estimate that the construction workforce would come from Fresno and neighboring counties and would commute to the job on a daily or weekly basis (PEC 2006a and PEC 2007a). It was estimated by the Building Construction Trades Council of Fresno, Madera, Tulare, and Kings Counties that 70% of affected trades for PEC's construction would come from Fresno County (Wu 2007).

There were 13,410 construction trade workers in the Fresno-Madera Metropolitan Statistical Area (MSA) in 2002 (CAEDD 2006b). Staff believes that construction workers travel to the job site on a daily basis, which may involve as much as a one or two-hour commute. Construction workers who live in communities at greater distances than a two-hour, one-way commute tend to relocate to the project area for the work week, and then return home on the weekend. The operational workforce is forecast to be from Fresno County and would commute rather than relocate (PEC 2006a).

SOCIOECONOMICS Table 1 shows that available labor, by skill, in Fresno County, with annual averages for 2002 and a projection for 2012, is large when compared to the PEC needs. Again, Fresno-Madera MSA has a fairly large construction trade workforce of 13,410 as of 2002 rising to 19,290 in 2012 (CAEDD 2006b). The peak construction activity (364 workers) for the PEC represents about 3% of the total construction workforce.

[1] Indirect changes are production changes in industries supplying the original industry (backward linkages). Induced changes are changes in regional household spending levels caused by regional employment impacts.

SOCIOECONOMICS Table 1
Available Labor in Fresno-Madera MSA by Skill for Construction and Operations

Occupational Title	Annual Averages 2002	Annual Averages 2012	Maximum Needed Per Month By Panoche Energy Center **
Insulation Workers	120	180	25
Boilermakers	N/AV*	N/AV	21
Carpenters/Cement Finishers	3,090	4,620	29
Electricians	1,120	1,600	64
Iron Workers	250	330	46
Laborers	2,230	3,290	47
Millwrights	60	90	62
Operating Engineer	670	980	19
Painters	690	930	13
Pipe fitters (Plumbers&Steamfitters)	1,220	1,790	58
Sheet metal workers	640	870	13
Surveyors	110	120	7
Teamsters (Truck Drivers, Heavy and Tractor-Trailer)	4,100	4,730	16
Commissioning Group (Contractor Staff)	N/AV	N/AV	5

Source: PEC 2006a and CAEDD 2006b.
* Not Available (N/AV) ** Includes construction, commissioning, and operation phases.

Project construction (power generation facility including the natural gas pipeline) is expected to occur over a 13-month period. The greatest number of construction workers (peak) would occur in the tenth month of construction. The number of construction workers would range from about 14 in the first month of construction to 364 workers at peak construction. There would be an average of 178 workers per month during construction. These workers are expected to come from Fresno, Madera, Tulare, and Kings Counties the area within two hours of the site. As such, staff expects that construction workers will commute from their homes rather than relocate. The commission group or contractor staff would be at maximum five. They would be non-local or coming from outside of Fresno County and would amount to 3% of the average construction and commissioning phases personnel (PEC 2006a&e, PEC 2007a, and Wu 2006). Staff would expect most of the construction workforce to come from the Fresno-Madera MSA as demonstrated in **SOCIOECONOMICS Table 1**. The Building and Construction Trades Council of Fresno, Madera, Tulare, and Kings Counties estimated 70% of the construction trades workforce for the project would come from Fresno County (Wu 2007).

During operation of the project, about 12 workers would be needed to maintain and operate the project. Operation workers would commute as much as one hour to the facility site from their homes. The operational workers are expected to be hired from Fresno County and commute rather than relocate (PEC 2006a).

Staff estimates that this increase in employment would have a small positive effect on Fresno County unemployment rates.

The total construction and commissioning employment is estimated at 382 total jobs (231 secondary (indirect and induced) jobs) based on an average of 151 project related construction and commissioning jobs. The PEC Project is estimated to result in $7.7 million in labor income and $2.3 million in output (total value of goods and services) for Fresno County (PEC 2006a&e). Staff estimates the construction employment multiplier is 2.5.

For operations, 12 direct operations jobs and 36 jobs as secondary impacts yield an estimated total of 48 jobs. The PEC Project operations yield $1.4 million in labor income and approximately $4 million in output in a four county region (Fresno, Madera, Tulare, and Kings Counties) (PEC 2006a&e). Staff estimates the operations employment multiplier is 4.

Staff finds the economic impact analysis is generally consistent with the economic literature cited by many economists (Moss et al. 1994) and therefore considers these projected beneficial economic impacts to be reasonable.

Fiscal and Non-Fiscal Effects

Some fiscal (having to do with the public treasury) impacts (all dollars are 2005) of the PEC include:

- Property taxes: $3.5 million (estimated for 2009) annually to Fresno County
- Construction total (state and local) sales tax: $119,620
- Operation total (state and local) sales tax: $77,358 annually
- School impact fee: $10,682.84 to the Mendota Unified School District (PEC 2006a&e and PEC 2007a).

Non-fiscal (private sector) impacts in 2005 dollars (PEC 2006a&e) include:

- Total capital costs are estimated at $250 million to $300 million.
- The construction 13-month payroll is $27 million. The annual operations payroll is $1 million.
- Approximately $1-$2 million would be spent locally on construction materials and supplies and $970,000 each operation year of the PEC for locally purchased materials as part of an operation and maintenance budget within Fresno County (PEC 2006a&e and PEC 2007a).

Housing

As of January 1, 2000, there were approximately 270,767 housing units in Fresno County. The vacancy rate for this housing averages approximately 6.6% for Fresno County, which includes single family, multi-family and mobile homes. There were 1,618 units in the City of Firebaugh and 1,919 units in the City of Mendota (PEC 2006a).

There is an ample supply of hotel/motels in Fresno County. As of July 2006, there are four hotel/motels with approximately 150 rooms in Mendota and Firebaugh (Panoche 2006a). As of August 10, 2006, there were 51 hotels/motels, 6,000 rooms, and a vacancy rate of 66% in the City of Fresno (Castillo 2006).

Again, the construction workforce is expected to come from Fresno, Madera, Tulare, and Kings Counties and commute daily (PEC 2006a&e and PEC 2007a). Staff finds the supply of permanent and temporary housing adequate to accommodate the non-local construction who would most likely not relocate.

There are two groups of housing near the PEC site. First, there are three residential units about 800 yards from the PEC site two which are vacant (Koshmashrab 2007). The applicant is making an agreement that would not allow these residences to be used for the 30-year operational duration of the power plant and relocate the current residents to a new residence at the north end of the parcel (Thompson 2006). Second, is the five unit (10 occupants), one-story residential complex 1,900 feet from the PEC site. An agreement is being developed to relocate the existing residents and convert the existing structure to a non-residential structure (Starwood 2006a). Overall, relocation would be envisioned for both groups of housing so no significant socioeconomic impacts are anticipated. Please see the **NOISE** section of this document for more information.

The entire permanent operational workforce is expected to commute from within Fresno County (PEC 2006a).

Staff concludes that there would not be a significant adverse socioeconomic impact on housing.

Schools

Fresno County has 311 schools and 191,464 students in 2004-2005 (California Department of Education 2006a). The PEC site is in the Mendota Unified School District, which has four schools and an enrollment of 2,355. The Firebaugh-Las Deltas School District has four schools and 2,355 students. The Mendota Unified School District is currently at capacity with plans to grow and add a middle school. The Firebaugh-Las Deltas School District is currently experiencing low enrollment based on the past few years (PEC 2006a).

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 would be small. Even so, this worst-case scenario is unlikely to occur since the non-local construction workers would likely commute weekly to the PEC site and would not likely relocate family members for the relatively short duration of construction.

For operation of the PEC, 12 operation workers are expected to be hired from the Fresno County labor force (PEC 2006a). Since all employees are expected to be hired from Fresno County and are expected to commute, there should be no significant adverse socioeconomic impacts.

Education Code section 17620 authorizes a school district to levy a fee against any construction within a district. 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. School impact fees to the Mendota Unified School District are estimated to be $10,682.84 (PEC 2006a). Please see the proposed Condition of Certification **SOCIO-1**.

Staff concludes that there would not be a significant adverse socioeconomic impact on education during the construction, commissioning, and operation of the PEC.

Parks and Recreation

Because the construction labor force would commute from a four-county area (Fresno, Madera, Tulare, and Kings Counties), but mostly from Fresno County, and the operation workforce is small and from Fresno County, staff concludes that there would be no significant adverse socioeconomic impacts on parks and recreation.

Law Enforcement

Fresno County Sheriff's Department provides service for the County and PEC site which is in the unincorporated part of western Fresno County. The site is served by Area 1 station in the City of San Joaquin about 24 miles or approximately 30 minutes from the PEC. Area 1 station has one lieutenant, seven sergeants, one office assistant, four community service officers, and 34 deputy sheriffs. At any time, at least three personnel are on staff at the station with five or six cars on patrol. Area 1 station stated it could respond to emergency situations without any negative impacts on sheriff's services to the community. There are also air support units from the Fresno County Sheriff's Department (PEC 2006a). The PEC area is also patrolled by the California Highway Patrol. There are adequate law enforcement resources available for the PEC. Staff finds no significant adverse socioeconomic impacts associated with law enforcement with the construction and operation of the PEC.

Medical Services

Fresno County contracts private emergency medical services from American Ambulance. American Ambulance has basic and advanced service and at least one paramedic available at all times. The project site is covered by the Mendota Station about 12 miles or 15 minutes away. Mendota Station can receive supplies of additional units from neighboring stations in Kerman and Los Banos in Fresno County so coverage is continuous. In addition, American Ambulance has rapid helicopter service in Fresno called Skylife which is 45 miles away or about a one-half hour, one-way flight for emergency medical service (EMS) staff 24 hours a day. The service has a flight nurse, plight paramedic, and EMS pilot (PEC 2006a).

Hospitals available for American Ambulance and Skylife are: Fresno Trauma Center (City of Fresno), Coalinga Regional Memorial Hospital (Kings County), Memorial Hospital Los Banos (Fresno County) or Dos Palos Memorial Hospital (Merced County) depending on the injury (PEC 2006a).

Additionally, first aid kits and fire extinguishers would be located in construction areas and foremen and supervisors would be trained in first aid. During operation, worker

safety programs would be implemented to minimize unsafe working conditions (PEC 2006a). Staff finds these EMS resources adequate.

Finally, the PEC would not displace significant numbers of people or directly or indirectly induce substantial population growth. Hence, there are no significant socioeconomic impacts that might trigger adverse physical impacts in the provision of medical services. For further discussion see the **Worker Safety** section of the PSA.

CUMULATIVE IMPACTS

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. “Cumulatively considerable” means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. (Cal. Code Regs., tit. 14, section 15130.)

Cumulative impacts could occur when more than one project has an overlapping construction schedule that creates a demand for workers that cannot be met by local labor, resulting in an influx of non-local workers and their dependents.

The PEC would average 178 workers per month and 364 during the peak month, for 13 months of construction. There is an anticipated 16-month time frame from October 2007 to January 2009 for the construction and commissioning phases.

Other CEC projects licensed or planned in Fresno County are:

- San Joaquin Valley Energy Center, a 1,087 MW combined cycle plant, was approved on January 14, 2004 by the Energy Commission but construction has not begun and is currently on hold.
- Starwood-Midway, a 120 MW natural gas peaker in Fresno County.
- Bullard Energy Center, a 200 MW natural gas peaker, in the City of Fresno.

A Federal Bureau of Prison (BOP) medium security Federal Correctional Institution (FCI) is slated to be built in Mendota, Fresno County, and 12 miles from the PEC and Starwood power plant sites. Major construction of the new FCI was scheduled to begin in 2005 and completion is expected in 2008. Phase I should be complete on March 22, 2007 but the construction status of Phase II is unknown (It is awaiting congressional authorization.) CEC 2007). Staff is attempting to get more information about this project. If appropriate and available, new information may be incorporated into the cumulative impacts section of the Final Staff Assessment (FSA). There are no additional known projects with similar construction needs in Fresno County.

Construction estimates for the PEC, Starwood, and Bullard Projects are shown in **SOCIOECONOMICS Table 2**. In August 2008, the peak construction workforce would be 515 workers for all three projects in Fresno County. The labor needed to construct the PEC, Starwood, and Bullard Projects would amount to approximately 4%of the 2002 construction workforce of 13,410 for Fresno County. However, the peak demand for PEC’s millwrights with two other projects may be tight or deficient relative to supply and

require some short-term labor force from outside four county area of Fresno, Madera, Tulare, and Kings Counties. These workers would most likely relocate in hotels and motels in the City of Fresno where there is considerable spare capacity and return on the weekend. Overall, staff finds there are no significant adverse socioeconomic cumulative impacts.

SOCIOECONOMICS Table 2
Cumulative Impact Analysis of the PEC, Starwood, and Bullard Construction Workforces 2008 to 2009

	PEC**	Bullard*,**	Starwood	Totals
2008				
February	146	132		278
March	216	135		351
April	263	130		393
May	324	92		416
June	364	112	26	502
July	276	158	56	490
August	235	190	90	515
September	167	229	106	502
October	99	256	110	465
November	60	196	100	356
December	21	169	88	278
2009				
January	16	124	86	226
February		80	55	135

Source: PEC 2006a, Bullard 2006, and Starwood Midway 2006a.
* Includes power plant construction and linears (gas pipeline, sewer line, and water supply line). ** Includes construction and commissioning.

NOTEWORTHY PUBLIC BENEFITS

Important public benefits discussed under the fiscal and non-fiscal effects section are: capital costs, construction payroll, annual property taxes and sales taxes, and the value of locally purchased construction and operation equipment and materials.

AGENCY AND PUBLIC COMMENTS

No comments related to socioeconomics were received from agencies or members of the public regarding the PEC.

CONCLUSIONS

Estimated gross public benefits from the PEC include increases in property and sales taxes, employment, and income for Fresno County. For example, there are estimated to be an average of 178 direct project-related construction jobs for the thirteen months of construction. The PEC is estimated to have total capital costs of $250 million to $300 million. The PEC construction payroll is estimated at $27 million for thirteen months and

the operation payroll is $1 annually. Property taxes are estimated at $3.5 million for the first year (2009) for a project life of 30 years. The estimated total sales and use tax during construction is $119,620 and during operation the total sales tax is $77,358 annually over the life of the project. An estimated $1-$2 million would be spent locally for materials and equipment during construction, and an additional $15 million would be spent annually for the operations and maintenance budget.

Staff concludes that construction and operation of the PEC would not cause a significant direct or cumulative adverse socioeconomic impact on the study area's housing, schools, law enforcement, emergency services, hospitals, and utilities. Hence, there are no socioeconomic environmental justice issues related to this project.

With the proposed condition of certification the project would be consistent with applicable LORS.

Finally, the following **SOCIOECONOMICS Table 3** provides a summary of socioeconomic data and information from this analysis, with emphasis on economic benefits of the PEC.

SOCIOECONOMICS Table 3
Data And Information[3]

Estimated Project Capital Costs	$250-$300 million
Estimate of Locally Purchased Materials	
Construction	$1-$2 million
Operation (Operation and Maintenance)	$970,000 per year
Estimated Annual Property Taxes	$3.5 million (estimated for 2009) to Fresno County
Estimated School Impact Fees	$10,682.84 to the Mendota Unified School District
Estimated Direct Employment	
Construction and commissioning (average)	151 jobs (average per month) (178 average for construction only)
Operation	12 jobs
Estimated Secondary Employment	
Construction & Commissioning (Fresno County)	231 jobs
Operation (Includes Fresno, Madera, Tulare, and Kings Counties)	36
Estimated Local Secondary Income	
Construction (Fresno County)	$7.7 million in labor income
Operation (Includes Fresno, Madera, Tulare, and Kings Counties)	$1.4 million in labor income
Estimated Payroll	
Construction	$27 million
Operation	Average: $1.0 million annually
Estimated Total Sales Taxes (Total: Combined State and Local, Fresno County)	
Construction	$119,620
Operation	$77,358 annually
Existing Unemployment Rates	Existing – 8% for Fresno County and 4.9% for California in June 2006, (Not Seasonally Adjusted)
Percent Minority Population (6 mile radius)	97.84%
Percent Poverty Population (6 mile radius and beyond)	23.5%
Percent Minority Population (1 mile radius)	100%
Percent Poverty Population (1 mile radius)	23.5%

3 Table 3 uses 2005 dollars, and construction (and commissioning) is for 16 months (unless otherwise indicated) and the projects' life is planned for 30 years. The results of the IMPLAN/Input-Output modeling are for Fresno County for construction and Fresno, Madera, Tulare, and Kings Counties for operations and show secondary, indirect and induced impacts, as well as direct impacts. Population is for a six mile and one mile radius from the power plant except as noted.

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner shall pay the one-time statutory school development fee to the Mendota Unified School District as required by Education Code 17620.

Verification: At least 30 days prior to start of project construction, the project owner shall provide to the CPM, proof of payment of the statutory development fee.

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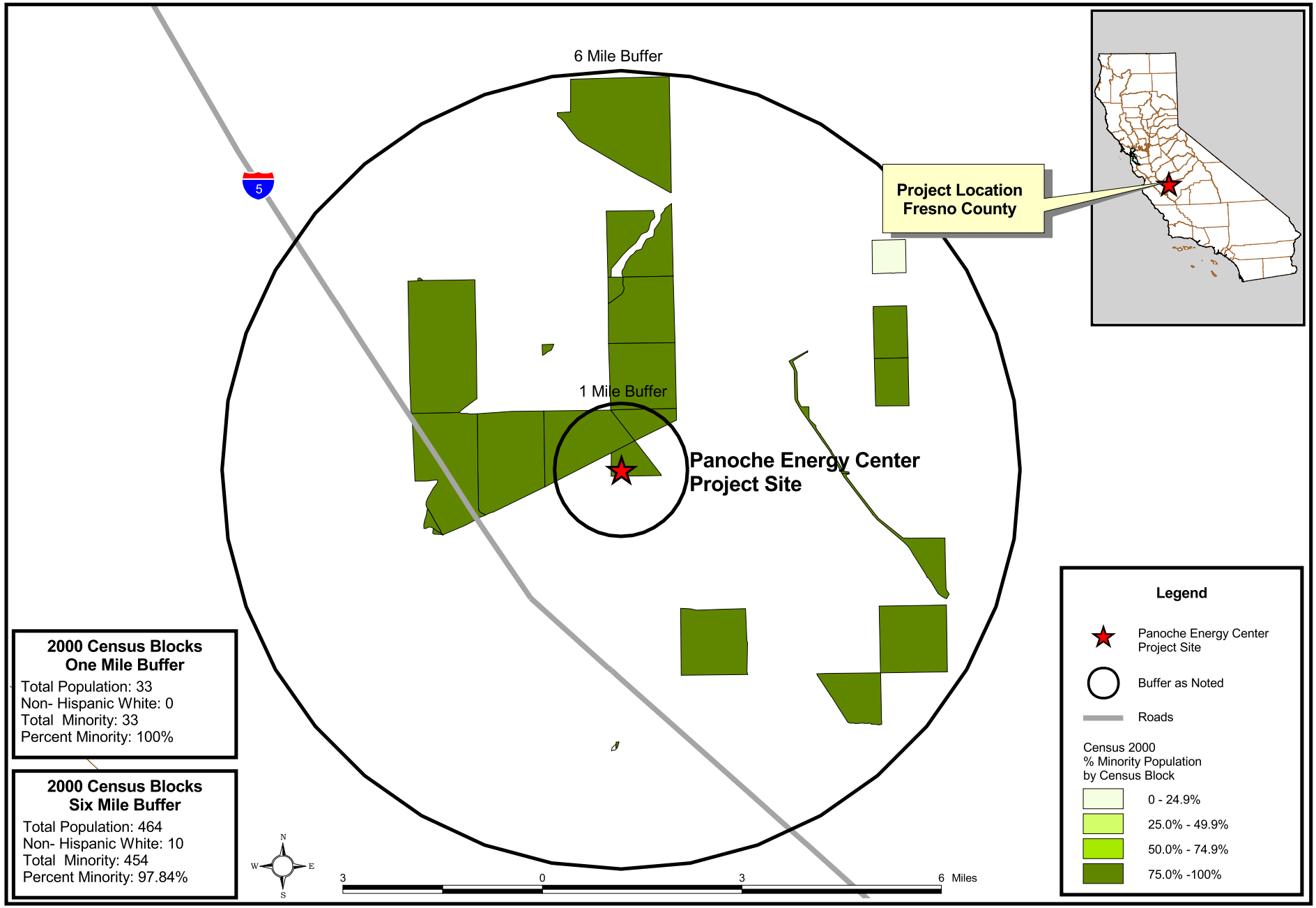
SOCIOECONOMICS - FIGURE 1

Panoche Energy Center - Census 2000 Minority Population by Census Block - One and Six Mile Buffer

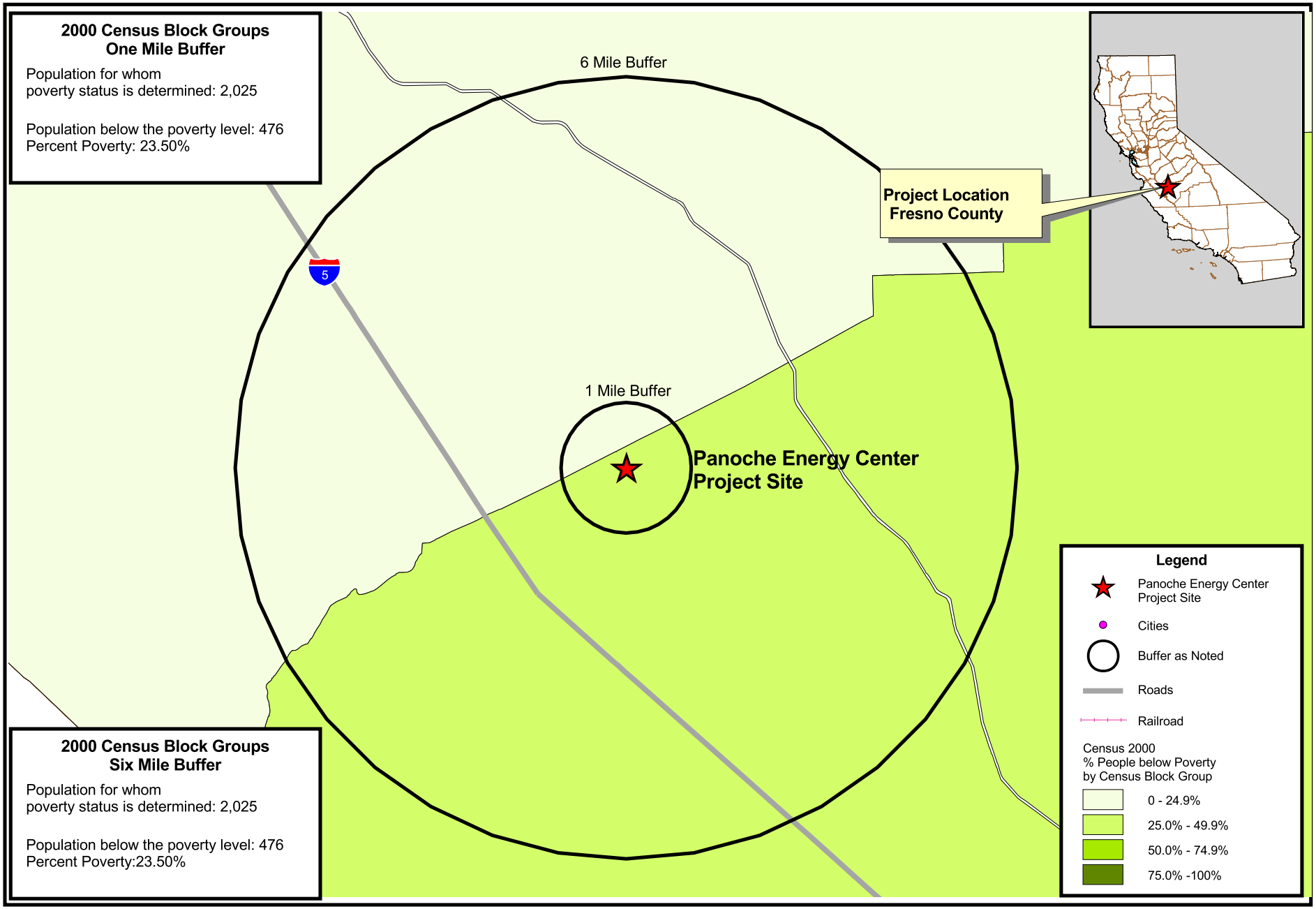


CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, AUGUST 2006

SOURCE: California Energy Commission Statewide Transmission & Power Plant Maps 2006, Census 2000 PL 94-171 Data - Matrix PL2

SOCIOECONOMICS - FIGURE 2

Panoche Energy Center - Census 2000 Percentage of People below Poverty by Census Block Group - One and Six Mile Buffer



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, AUGUST 2006

SOURCE: California Energy Commission Statewide Transmission & Power Plant Maps 2006, Census 2000 SF3

SOIL & WATER RESOURCES

Somer Goulet M.S.E.L. and Richard Anderson

SUMMARY OF CONCLUSIONS

Based on its assessment of the proposed Panoche Energy Center (PEC) project, staff makes the following findings:

- Potential adverse impacts caused by erosion and stormwater flows during construction and operation would be mitigated with the development and implementation of an effective Storm Water Pollution Prevention Plan and a Drainage, Erosion and Sedimentation Control Plan;
- The proposed water supply for the project is not consistent with state water use or conservation policies;
- Potential adverse impacts from the processing of wastewater or the use and storage of hazardous materials would be avoided with the adoption and implementation of an effective Hazardous Materials Management Program and Storm Water Pollution Prevention Plan; and
- With the exception of the proposed water supply, which staff has determined is a unmitigated significant environmental impact, the proposed project would comply with all applicable federal, state and local laws, ordinances, regulations and standards with the adoption of the recommended conditions of certification.

INTRODUCTION

This section of the Preliminary Staff Assessment (PSA) analyzes the potential effects on soil and water resources by the Panoche Energy Center (PEC) simple-cycle power generation project. This analysis specifically focuses on the potential for PEC to:

- cause accelerated wind or water erosion and sedimentation;
- exacerbate flood condition in the vicinity of the project;
- adversely affect surface or groundwater supplies;
- degrade surface or groundwater quality; and
- comply with all applicable laws, ordinances, regulations and standards (LORS).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

SOIL AND WATER RESOURCES Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
Clean Water Act (CWA) (33 USC Section 1251 et seq.)	The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non point source discharges to surface water. This includes regulation of storm water discharges during construction and operation of a facility normally addressed through a general National Pollutant Discharge Elimination System (NPDES) permit.
CWA Section 401	Section 401 of the CWA requires that any activity that may result in a discharge into a water body must be certified by the Regional Water Quality Control Board (RWQCB)
CWA Section 404	Section 404 of the CWA authorizes the U.S. Army Corps of Engineers (ACOE) to regulate the discharge of dredged or fill material to the waters of the U.S. and adjacent wetlands. The ACOE issues site specific or general (Nationwide) permits for such discharges.
Resource Conservation and Recovery Act (RCRA) (40 CFR Part 260, et seq.)	RCRA seeks to prevent surface and groundwater contamination, sets guidelines for determining hazardous wastes, and identifies proper methods for handling and disposing of those wastes.
State	
California Constitution, Article X, Section 2	The State Constitution requires that the water resources of the state be put to beneficial use to the fullest extent possible and states that the waste, unreasonable use or unreasonable method of use of water is prohibited.
Porter Cologne Water Quality Control Act (PCWQCA) (Water Code §13000 et seq.)	PCWQCA requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. These standards are typically applied to the proposed project through the Waste Discharge Requirements (WDRs) permit. These regulations require that the RWQCB issue Waste Discharge Requirements specifying conditions regarding the construction, operation, monitoring and closure of waste disposal sites, including injection wells and evaporation ponds for waste disposal.
California Water Code (CWC) Section 13550	CWC Section 13550 requires the use of reclaimed water for industrial purposes subject to reclaimed water being available and meeting certain conditions such as the quality and quantity of the reclaimed water are suitable for the use, the cost is reasonable, and the use is not detrimental to public health.
California Water Code (CWC) Section 13552.6	CWC Section 13552.6 prohibits the use of domestic water for cooling towers if suitable recycled water is available.
The California Safe Drinking Water and Toxic Enforcement Act (California Health & Safety Code §25249.5 et seq.)	The California Safe Drinking Water and Toxic Enforcement Act prohibit actions contaminating drinking water with chemicals known to cause cancer or possessing reproductive toxicity.

Recycling Act of 1991 (Water Code § 13575 et esq.)	The Water Recycling Act of 1991 encourages the use of recycled water for certain uses and establishes standards for the development and implementation of recycled water programs.
California Code of Regulations, Title 22	Under Title 22 of the California Code of Regulations, the California Department of Health Services (DHS) reviews and approves wastewater treatment systems to ensure they meet tertiary treatment standards allowing use of reclaimed water for industrial processes such as steam production and cooling water.
Warren-Alquist Act Public Resources Code Section 25500 et seq.	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, §25500). The Energy Commission must review power plant AFCs to assess potential environmental and public health and safety impacts, potential measures to mitigate those impacts (Pub. Resources Code, §25519), and compliance with applicable governmental laws and standards (Pub. Resources Code, §25523 (d)).
Energy Commission Integrated Energy Policy Report (IEPR) 2003	Consistent with State Water Resources Control Board Policy 75-58 and the Warren–Alquist Act, the Energy Commission will approve the use of fresh water for cooling purposes by power plants it licenses only where alternative water supply sources and alternative cooling technologies are shown to be "environmentally undesirable" or "economically unsound".
State Water Resources Control Board Policies (SWRCB), Policy 75-58 & Policy 88-63	The principal policy of the SWRCB that addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant 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. Resolution 75-58 defines brackish waters as "all waters with a salinity range of 1,000 to 30,000 mg/l. Policy 88-63 defines suitability of usage. The total dissolved solids must exceed 3,000 mg/L for it to not be considered suitable, or potentially suitable, for municipal or domestic water supply.
Local	
County of Fresno Ordinances Building & Construction, Grading & Erosion Chapter 15.28 Street & Utility Improvement Chapter 17.68 Water & Sewage Chapter 14.04 & 14.08	The County of Fresno has permit requirements associated with Grading and Erosion Control, Encroachment Permits and securing a Franchise Agreement for the natural gas and recycled water lines within County right-of-ways and requirements associated with a Well Drilling Permit.
Fresno County Department of Community Health, Environmental Health System, California Well Standards Ordinance and California Well Standards, Bulletins 74-81 and 74-90	The Fresno County Environmental Health System regulates the construction of new water wells; the reconstruction, repair or deepening of existing wells; and the destruction of abandoned wells in unincorporated Fresno County.

Fresno County General Plan, Water Quality Policies OS-A.23 through OS-A.30 and Programs OS-A.A through OS-AD	The purpose of these policies and programs is to help control potentially significant impacts of development, including non-point sources of water pollution, such as runoff from urban areas, grading, construction, and agricultural activities.
Fresno County Department of Health and Safety, Fresno County Ordinance Code 8.50.050 4-B	Any place for the disposal of sewage, feculent matter, etc. which has been produced or formed as a result of or incidental to the operation of any industrial plant requires an environmental health permit and is subject to inspection fees.
Fresno County Ordinance Title 15	Fresno County Ordinance Title 15 requires that projects within the hazard zone be raised to ensure that, in the event of a 100-year storm, the site and equipment is not subjected to any flood damage.

SETTING

The PEC project is located in an unincorporated area of western Fresno County approximately 50 miles west of the City of Fresno. The nearest intersection to the proposed project is West Panoche Road and South Fairfax Avenue. The PEC project is a proposed simple-cycle electric generation project on 12.8 acres of a 128-acre parcel. The laydown area for the PEC project would be an eight-acre site on the same parcel.

REGIONAL AND SITE VICINITY DESCRIPTION

The proposed PEC project would be located within the San Joaquin Valley and the Westside Sub-basin of the San Joaquin Valley Groundwater Basin. There are no natural or artificial water bodies in the vicinity of the site with the exception of the California Aqueduct, approximately two miles to the east, and Panoche Creek, the main drainage in the area, which is approximately two miles northwest of the proposed project. This rural unincorporated section of Fresno County is characterized by extremely flat topography, agriculture practices, and sparsely located houses.

PROJECT, SITE, AND VICINITY DESCRIPTION

The applicant proposes to build a simple-cycle electric generation project consisting of 4 natural gas-fired combustion turbine generators (CTGs). Each CTG unit would have the capability to generate 100 megawatts MW with a net generating capacity of 400 MW. The proposed PEC would utilize the inter-cooled gas turbine system developed especially for the needs of the power generation industry.

Existing use on the proposed site is a pomegranate orchard. Surrounding uses in the general area are mostly agricultural. Adjacent to the site to the east is the Wellhead Power Peaking Plant and the CalPeak Power Peaking Plant. Adjacent to the CalPeak Power Peaking Plant is the proposed site for the Starwood-Midway, LLC (Starwood) power plant which is also under Energy Commission review (06-AFC-10). Approximately two miles to the west of the proposed site is Interstate 5. Additionally, within the vicinity of the proposed PEC there is a proposed Federal Correctional Institution near the city of Mendota, the Mendota Federal Medium-Security Prison.

The PEC project would include the following: a cooling tower to provide cooling for the intercooler and lube oil coolers connected to each of the facility's four LMS100 CTGs, de-mineralized water system utilizing trailer-mounted exchangers that will be regenerated offsite; reverse osmosis (RO) system; 240,000 gallon de-mineralized water storage tank; 500,000 gallon raw water/firewater storage tank; deep well injection system; and an infiltration basin sized to capture 85% of the annual storm water runoff from the industrial areas.

Additional equipment proposed for the PEC include inlet air filters with evaporative coolers, turbine compressor section inter-cooler, mechanical draft cooling tower, circulating water pumps, water treatment equipment, natural gas compressors, generator step-up, and auxiliary transformers.

Several new linear facilities would be required for the proposed PEC. Please refer to AFC Project Description for detailed explanation of the proposed project. The proposed project's linear features are:

- 400 - foot new paved access road south of West Panoche Road;
- 2,400 linear feet of new gas pipeline to connect to the PEC; and
- 300 feet of new transmission line to tie into the existing PG&E Panoche Substation which PG&E is planning to expand by 2.2 acres southward.

SOILS

The proposed PEC site is currently a pomegranate orchard and has been designated by the California Department of Conservation as Farmland of Statewide Importance.

The native soils present in the vicinity of the PEC facility site and surrounding property consist of the Panoche Series. The Panoche Series soil typically slopes at zero (0) to two (2) percent, with medium runoff. The Panoche Series soils in this area are made up of about 85% Panoche clay loam, 5% Cerini clay loam, 4% Calflax clay loam, 2% Ciervo clay loam, 2% Posochanet clay loam, saline-sodic, and 2% Kimberlina sand loam.

Panoche clay loam soils are Capability Unit Classification I, with Capability Subclass VIIc. There are no major limitations and few overall limitations for this soil. Permeability of this Panoche soil is moderate, with an available water capacity that is high or very high. Effective rooting depth is 60 inches or more. As stated, runoff is medium, and the hazard of water erosion is slight.

The surface layer is light brownish gray clay loam about 7 inches thick. The upper 9 inches of the subsoil is light brownish gray loam. The next 27 inches is light gray loam, followed by over 14 inches of light brownish gray loam. The lower part to a depth of 72 inches is light brownish gray sandy loam. The soil is calcareous throughout. In some areas the surface layer is clay, sandy clay loam, or loam.

The following is a table of the major soils in the area and their characteristics.

SOIL AND WATER RESOURCES Table 2
Soils in the PEC Project Area

Primary Soil Name	Parent Material	Natural drainage class	Surface Runoff	Slowest Permeability	Water Capacity	Present Flooding
Panoche clay loam 0-2% slopes	Alluvium derived from calcareous sedimentary rock	Well drained	Negligible	Moderate	About 9.3 inches (high)	Very rare
Cerini clay loam 0-2% slopes	Alluvium derived from calcareous sedimentary rock	Well drained	Low	Moderately slow	About 9.5 inches (high)	Very rare
Calfax clay loam, subsided, 0-2% slopes	Alluvium derived from calcareous sedimentary rock	Moderately well drained	Medium	Slow	About 7.7 inches (high)	Very rare
Ciervo clay loam 0-2% slopes	Alluvium derived from calcareous sedimentary rock	Moderately well drained	Medium	Slow	About 9.7 inches (very high)	Very rare
Pasochanet sandy loam	Alluvium derived from calcareous sedimentary rock	Moderately well drained	Medium	Slow	About 8.4 inches (High)	Very rare
Kimberlina sandy loam	Alluvium derived from calcareous sedimentary rock	Well drained	Negligible	Moderately rapid	About 7.1 inches (High)	Very rare

Source: http://websoilsurvey.nrcs.usda.gov/app

GROUNDWATER

The proposed PEC site is located within the aquifer system of the Central Valley of California. The Central Valley is composed of three main hydrographic sub-basins. The northernmost sub-basin is the Sacramento Valley and is drained by the Sacramento River. The San Joaquin Valley, making up the southern two-thirds of the Central Valley is divided into two sub-basins: the San Joaquin Basin drained principally by the San Joaquin River, and the Tulare Basin, an enclosed basin with no outlet to the ocean. The PEC site is located in the San Joaquin Basin.

Groundwater has been and is a large portion of the water supply for the San Joaquin Valley for both irrigation and domestic uses. Extensive groundwater pumping in the San Joaquin Valley since the turn of the century has resulted in widespread land subsidence. Subsidence began in the late 1800's as groundwater was pumped for

irrigation and more than 5,000 square miles have subsided by more than one foot, with local areas of subsidence of greater than 20 feet (USGS, 1991). Land subsidence due to groundwater withdrawal is caused by compaction of clay units within the aquifer system as the hydraulic head declines and water is released from the clays into the aquifer system. Over pumping of groundwater in the Central Valley has played a part in levee instability of the Delta causing increased water salinity. Even though subsidence has slowed considerably since the late 1970s, significant increases in groundwater pumping and lowering of water levels could cause subsidence to resume (USGS, 1989; USGS, 1991).

The aquifer system of the San Joaquin-Tulare basins is contained in the southern two-thirds of the Central Valley aquifer system. The aquifer system is made up of Post-Eocene continental rocks and deposits, which contain most of the fresh water in the valley (USGS, 2007). The PEC project proposes to drill two production wells into the lower aquifer to provide a maximum of an annual average of 1,154 acre-feet per year, of process water. The San Joaquin Valley is currently experiencing drought conditions and reduced Delta outflow triggering increased agricultural pumping. The PEC's use of groundwater could increase the likelihood of subsidence to resume. Additionally, the City of Mendota and other nearby communities use well water from the lower aquifer for their domestic water supply after state mandated filtration and treatment. With the additional consumption of lower aquifer groundwater from the PEC, there could be a detrimental impact on lower aquifer groundwater supply. The additional pumpage of lower aquifer groundwater could increase the salinity level of the lower aquifer groundwater as well as the quantity of groundwater available. As the lower aquifer groundwater is considered fresh inland waters, the proposed usage of this source of groundwater would contribute to the diminishing drinking water supply, which would significantly impact the municipal well water supply of Mendota and other nearby communities.

Groundwater quality in the San Joaquin Valley is generally good in the deeper semi-confined and confined aquifers (Freeman 2007). The shallow aquifers, however, generally have poor water quality with high dissolved solids, chloride, and sulfate concentrations (USGS 1989). Additionally, pesticides and fertilizers that have been applied to the land have leached into the shallow upper aquifers via irrigation water. According to the April 24, 2007, Water Quality Evaluation conducted by the PEC (PEC 2007h), the lower aquifer groundwater (which the PEC project proposes to use) presents high sodium hazard and is generally unsuitable for continuous use as a sole source of water supply for domestic, municipal, and/or agricultural uses. However, as noted above, the Cities of Mendota and Firebaugh rely on the lower aquifer groundwater as their municipal drinking water source after state mandated filtration and treatment. It has been stated by the City of Mendota engineer and documented in several reports that the lower aquifer groundwater is the area's last supply of good quality water (Giersch, 2007). The Mendota and Firebaugh city staffs raised concerns that competing uses of the lower aquifer groundwater would have a negative effect on municipal drinking water supplies.

The PEC project is in the Westlands Water District. Since its inception, the Westlands Water District has been faced with shallow groundwater drainage problems over an area of up to 200,000 acres. The federal Bureau of Reclamation (USBR) was obligated

to remedy these problems. Following passage of the Central Valley Project (CVP) Improvement Act, USBR initiated a land retirement program in which drainage-impacted lands were purchased and taken out of irrigated production. As of 2006, nearly 100,000 acres have been retired. Additionally, in 2004, the Westlands Water District transferred approximately 600 acres of retired drainage-impaired and non-irrigable lands within the District to the Federal Bureau of Prisons for construction of the Mendota Federal Medium-Security Prison in exchange for annual rights to the Central Valley Project water appurtenant to all the lands being acquired by the prison within the prison's approximately 960 acre site (WWD 2004). The USBR recently released a San Luis Drainage Features Reevaluation Report and Environmental Impact Statement (EIS) in which it recommended land retirement in lieu of providing drainage service. Ultimately the total acreage retired in the Westlands Water District may reach 200,000 acres or more, reducing total annual District water demand by up to 500,000 acre-feet per year. As a part of the land retirement program, CVP contract water supplies associated with the retired land will remain with Westlands Water District.

SURFACE WATER HYDROLOGY

The largest streambed in the PEC project area is Panoche Creek, which is located approximately two miles northwest of the project site. Site elevation is approximately 420 feet above mean sea level and slopes gently down to the northeast at approximately 1% grade. In addition to Panoche Creek, the CVP is distributed through the Westlands Water District, and provides surface water to the Central Valley. Due to agriculture groundwater pumping and reclamation activities, the ground water in the Central Valley experienced land subsidence starting back in the late 1800's (USGS 2000). The land subsidence was, in part, one of the reasons for the CVP to be built. The CVP was built in order to address the problem of over pumping groundwater by agricultural practices which left a rapidly diminishing supply of groundwater. The CVP provides irrigation, municipal and industrial, recreation, power, flood control, and water quality benefits to the area. However, addressing water supply issues, the Westlands Water District Board of Directors determined in 2006, that no new non-agricultural service connections to the CVP were to be authorized (WWD 2006).

WATER USES

Peak water usage associated with the PEC project would include 1,647,000 gpd of cooling tower makeup, 534,000 gpd of de-mineralizer system, 62,000 gpd of evaporation cooler makeup, and 7,000 gpd of plant service water. The average annual water use of the proposed project, operating at 5,000 hours per year, would be 1,154 acre – feet per year. The PEC project proposes to use well water from the lower aquifer below the Corcoran Clay formation. Although the lower aquifer groundwater has high TDS, it is still considered fresh inland waters. If the PEC were to use the lower aquifer groundwater as makeup water, a portion of the lower aquifer groundwater would go through a RO and demineralization process in order to reduce the total solids before being injected into the CTG for nitrogen oxides control.

Raw water from the production wells would be treated to meet federal, state, and local requirements for safe water use. Additionally, drinking water would be supplied by a bottled water purveyor.

The following table details the daily and annual water flow rates.

SOIL AND WATER RESOURCES Table 3
Daily and Annual Water Flow Rates

	Maximum Daily (1000's gal/day)	Average Daily (1000's gal/day)	Average Annual (1000's gal/day)
Production Well Supply			
Cooling Tower Makeup	1,647	1,238	793
Demineralizer System	534	511	328
Evaporative Cooler Makeup	62	14	9
Plant Service Water	7	7	5
Total Process Water	**2,250**	**1,770**	**1,135**
Wastewater Injection			
Cooling Tower Blowdown	514	388	248
RO System Rejects	133	128	82
Evaporative Cooler Blowdown	31	7	4
Plant Drains	14	14	9
Intercooler Condensation	448	3	2
Total	**740**	**540**	**345**
Water Well (Safety Use Only)	0.375	0.250	0.280
Septic System (Sanitary Drains Only)	0.375	0.250	0.280

PEC AFC Table 5.5-5.

WATER QUALITY

The PEC project proposes to use lower aquifer groundwater. The following table identifies expected groundwater quality based on characteristics of a private well close to the proposed project site. This lower aquifer well draws water at a rate of 4.4 cubic feet per second.

SOIL AND WATER RESOURCES Table 4
Quality of Water Supply

Constituent	Concentration
Arsenic	.011 ppm
Boron	1.8 ppm
Chloride	47 ppm
E.C.	1300 um/cm
Sulfate	420 ppm
TDS	820 – 1100 ppm
Rate	4.4 cfs

Russ Freeman; Westlands Water District.

The main water use for the PEC project is to provide cooling for the simple cycle combustion generation technology. The two on-site production wells are proposed to supply approximately 2,250,000 gpd of process water under peak daily load. The process water has a total dissolved solid (TDS) of approximately 820 - 1100 ppm (PEC 2007h). In addition to cooling, the lower aquifer water would be used for fire protection water, plant service water, cooling tower makeup, combustion turbine generator (CTG)

NOx injection (after treatment) and combustion turbine inlet air evaporative cooler makeup (partly from treated water).

PROCESS AND SANITARY WASTEWATER

The proposed PEC facility would use a deep well injection system for wastewater disposal. Wastewater would be collected in the wastewater collection tank(s) and conveyed by a six-inch-diameter pipeline to be injected into new disposal wells located on-site. The PEC applied for U.S. Environmental Protection Agency (EPA) permits for 6 Class I Non-hazardous Deep Wells. The proposed deep wells will be located approximately two (2) miles south of the abandoned Cheney Gas Well Field. Underground Injection Control Class 1 Permits and Waste Discharge Requirements would be required. The PEC is expected to generate process wastewater that will require disposal at an average generation rate of 503,000 gpd or approximately 350 gallons per minute (gpm).

The proposed zone of groundwater injection beneath the site is within the Eocene sands (Laguna and Cima) that extend from approximately 4,800 to 5,600 feet beneath the site. The sands are overlain by a laterally extensive, 900+ feet-thick shale sequence known as the Kreyenhagen Formation. This relatively impervious shale sequence acts as a confining zone that prohibits the vertical migration of high saline groundwater within the Eocene sands up to shallower lower saline groundwater. There is no known faulting within the area of the proposed injection that might affect the integrity of the Kreyenhagen Formation (PEC 2007f). The proposed injection zone would provide more than adequate storage for 30+ years of continuous operation with no potential impact to local groundwater supplies (PEC 2007f).

The PEC industrial wastewater discharge from the plant would consist of cooling tower blowdown, RO rejects, evaporative cooler blowdown, and water effluent from the oil-water separator. The wastewater from the equipment would be collected in the plant's wastewater collection tanks (cooling tower washwater drain tank and a blowdown tank) and injected into the deep wells.

The following table is the PEC proposed estimated wastewater volumes to be injected into the wells.

SOIL AND WATER RESOURCES Table 5
Estimated Waste Water Volumes

Waste Stream	Daily Average	Daily Maximum
Cooling Tower Blowdown	430,000 gpd	537,500 gpd
Floor Drains	58,000 gpd	72,500 gpd
Demineralization Wastes	15,000 gpd	18,500 gpd
Total Injection Well	**503,000** gpd	**628,500** gpd

PEC AFC Table 5.5-12.

Sanitary wastes from the administration and control building and other restrooms located on site would be disposed of in a septic system and leach field. The septic tank and leach field would be located directly south of the administration and control building. Under Fresno County ordinances, septic tanks and leach fields are only permitted when there is no sewer system available within 100 feet of the site. The applicant would be

required to obtain approval of its project plan for the septic tank and leach field from the Fresno County Department of Health and Safety.

STORM WATER

The proposed PEC project is on the edge of the Federal Emergency Management Agency (FEMA) special flood hazard area (Zone A) inundated by the 100-year flood with no base flood elevation. Fresno County Ordinance Title 15 requires that projects within the hazard zone be raised to ensure that, in the event of a 100-year storm, the site and equipment is not subjected to any flood damage. The site would be raised in conformance with the Fresno County Ordinance Title 15, Flood Hazard areas as needed.

Stormwater from the portions of the proposed project site containing industrial activities would be conveyed by overland flow and swales to an infiltration basin located at the southeast corner of the proposed site. The infiltration basin would be sized to capture 85% of the annual stormwater runoff from the industrial areas of the proposed site. Additionally, the infiltration basin is proposed to also manage peak stormwater runoff during the 100-year 24-hour storm event. Stormwater from the areas not containing industrial activities would run off the site as sheet flow. All non-industrial stormwater runoff from parking areas, switchyards, administration buildings and open spaces would run off as sheet flow.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

This project was analyzed to determine if it complies with LORS and meets the standards found in relevant documents such as the California State Water Resources Control Board, “Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling” (“Resolution 75-58”), and the California Environmental Quality Act (CEQA) Guidelines, Appendix G-VIII, Hydrology and Water Quality paragraph items (a) and (b). The threshold of significance is based upon the ability of the project to be built and operated without violating erosion, sedimentation, flood, surface or groundwater quality, water use (supply) or wastewater discharge standards. Energy Commission staff considers LORS inconsistency to be a significant impact pursuant to CEQA.

The Federal and State LORS and State and Local Policies presented in **Soil & Water Resources Table 1** was used to determine the threshold of significance and project consistency with state water policy. For those impacts that exceed the published standards or do not conform to the established practices, mitigation has been proposed by staff to reduce or eliminate the impact. Responsible or co-lead (CEQA/National Environmental Policy Act - NEPA) agencies (or those with an advisory or trustee capacity), particularly those with discretionary approval over various aspects of the project will be consulted as required. For example, the local Regional Water Quality Control Board has extensive expertise and LORS responsibility for soil and water issues under their jurisdiction. Where it is necessary for the project to conform to legally enforceable LORS or other regulatory requirements in which the purpose is to define an

allowable level of impact or activity, such requirements may be used if they are determined by staff to be adequate as thresholds of significance.

The application of Best Management Practices (BMP) will be required to manage stormwater related drainage, erosion, and sedimentation issues during the construction and operational of the PEC. The BMPs will be developed, implemented, monitored, maintained, and modified or changed as appropriate construction/operational plans and procedures are completed. The BMPs are formulated to prevent the occurrence of significant impacts based on specific thresholds. Staff has recommended and proposed Conditions of Certification specifically prescribing BMPs and procedures where necessary.

The methods used to analyze impacts and determine thresholds of significance for any impact are, in many cases, particular to the situation and reflect a site-specific approach for each project component and each impact. While all projects will likely have impacts, the goal is to limit any impacts to an insignificant or acceptable level, or to avoid them, if possible. Such a determination will rely on science, technology, expert opinion, and best professional judgment to determine what the level of change to the baseline or preexisting conditions should be allowed.

The available scientific, technical, or other appropriate literature was considered in the analysis and determination of significant impacts. Project-specific studies or assessments were reviewed, as necessary, in order to establish thresholds, adequately estimate the project's impacts, and develop appropriate mitigation.

Staff's analysis relies on estimates and information provided by the applicant regarding the construction and operation of the PEC project. Determination of potential impacts and recommended mitigation are the direct result of PEC related information and estimates.

DIRECT AND INDIRECT IMPACTS AND MITIGATION

Erosion Control and Stormwater Management

Construction and operation impacts for erosion and stormwater must be addressed to avoid potential adverse impacts to water quality and soil resources. Accelerated wind and water-induced erosion may result from earth moving activities associated with construction of the proposed project. Alteration of the soil structure leaves soil particles vulnerable to detachment and removal by wind or water. Soil erosion causes the loss of topsoil and can increase the sediment load in surface receiving waters downstream of the construction site. Increasing the amount of impervious surfaces would increase the amount of runoff and peak discharges.

As noted above in **Soil & Water Resources Table 2**, soils that would be affected by the proposed project consist of the Panoche Series, which has a moderate susceptibility to erosion. Since the project site currently is disturbed land used for agriculture production, the protective cover of vegetation has already been removed and the structure of the surface soil has already been altered. Soil compaction due to site grading, placement of foundations, paving, vehicle traffic and equipment staging areas would result in increased runoff, erosion and sedimentation.

Industrial stormwater would be conveyed by overland flow and swales to an infiltration basin located on site. Although PEC proposes that non-industrial stormwater drainage would leave the proposed site as sheet flow, staff recommends all stormwater be directed to the infiltration basin (Condition of Certification **SOIL & WATER-2).**

Construction activities would consist primarily of access road construction, foundation and laydown construction, erection of major equipment and structures, installation of gas pipelines, electrical systems (a new 300 foot 230 kV transmission line), stormwater infiltration basin, and control systems. There are no other proposed linear facilities off-site (PEC 2006, AFC Section 5.4.3). The only surface materials noted by the applicant that would be used at the site are concrete and gravel. Construction activities would increase short-term soil erosion. Once construction is complete, the project site would be partially covered with impervious surfaces, and erosion would be reduced.

Staff recommends the adoption of three conditions that address mitigation measures designed to reduce any soil erosion and stormwater impacts to less than significant levels.

Condition of Certification **SOIL & WATER-1** requires the project owner to comply with all of the requirements of the General NPDES Permit for Discharges of Storm Water Associated with Construction Activity, including the development and implementation of a Storm Water Pollution Prevention Plan for Construction.

Condition of Certification **SOIL & WATER-2** requires the project owner to obtain Compliance Project Manager (CPM) approval for a site-specific final Drainage, Erosion and Sedimentation Control Plan (DESCP) that addresses all project elements and ensures protection of water and soil resources for the construction and operational phases of the project.

Condition of Certification **SOIL & WATER-3** requires the project owner to comply with all requirements of the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity, including the development and implementation of an operational Storm Water Pollution Prevention Plan.

With the implementation of Conditions of Certification **SOIL & WATER 1-3**, staff concludes that the PEC project would mitigate any potential adverse impacts caused by erosion or storm water discharge during construction and operation of the project.

Water Use

PEC proposes to obtain groundwater from the lower aquifer by drilling two new on-site production wells. The lower aquifer groundwater is expected to have total dissolved solids content of approximately 820-1100 mg/L (URS 2007h). PEC would circulate, continuously treat, and control the groundwater in order to achieve approximately 3.2 cycles of concentration. The wastewater would be disposed of via deep well injection. The EPA would permit these injection wells and no significant environmental impacts are expected as a result of the wells.

Staff evaluated the potential impact of PEC water use on existing water users. The perennial yield of groundwater in the sub-basin is approximately 200,000 acre-feet

(WWD 2006). The maximum annual groundwater demand from the PEC would be approximately 1,154 acre-feet year (AFC 5.5-21). In 2005, Westlands Water District pumped a total of 1,090,000 acre-feet of groundwater and would have pumped more if the District and its water users had not transferred in other surface water supplies (WWD 2006). If pumping in the Westside Sub-basin exceeds 200,000 acre-feet per year, the PEC would contribute approximately 0.5% to the reduction in supply of groundwater levels. The lowering of groundwater levels could contribute to an adverse impact of resuming land subsidence in the Central Valley as well as diminishing the quality and quantity of lower aquifer groundwater for municipal, domestic, and agricultural uses. PEC maintains that no other users would be affected by their use of the lower aquifer groundwater. However, staff has identified the City of Mendota and the City of Firebaugh as other primary users of the lower aquifer groundwater which the cities filter and treat according to state health mandates and provide to residents as a potable supply. Additionally, there are proposed housing developments in those communities, related to the new prison in Mendota that would most likely utilize the lower aquifer groundwater, as well.

The California State Water Resources Control Board Resolution No. 75-58, states that inland waters, such as the lower aquifer groundwater proposed for use by the PEC, should be the very last source of water considered for powerplant cooling (SWRCB Res. No. 75-58). Therefore, the proposed use of the lower aquifer groundwater by the PEC is inconsistent with state LORS and Energy Commission staff considers LORS inconsistency combined with inappropriate use of fresh inland water to be a significant environmental impact pursuant to CEQA.

Staff recommends the adoption of the following conditions that address mitigation measures designed to reduce any lower aquifer groundwater impacts to less than significant levels.

Condition of Certification **SOIL & WATER-7** requires the project owner to find another source of water for fire protection, plant service water, cooling tower makeup, combustion turbine NOx injection, combustion turbine inlet air evaporative cooler makeup, and CTG injection/RO system. The water source the PEC proposes for water supply shall not significantly impact other water users.

Required Energy Commission Findings

In order for PEC to use groundwater, the Energy Commission must find that the proposed use complies with LORS and applicable water policies.

LORS and water policies applicable to this project stem from, among other things, Article X, Section 2 of the California Constitution, which declares that “the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented…” In order to better define what “unreasonable use” means in terms of power plant cooling, the State Water Resources Control Board (SWRCB) issued Resolution 75-58, “Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling” (“Resolution 75-58”). It sets forth, in priority order, a list of preferable water sources for powerplant cooling. This list, in priority order, is as follows: (1) wastewater being

discharged to the ocean, (2) ocean, (3) brackish water from natural sources or irrigation return flow, (4) inland wastewaters of low TDS, and (5) other inland waters. Based, in part, on these two water policies, the Energy Commission's Integrated Energy Policy Report, 2003 ("IEPR") specifies that "the Energy Commission will approve the use of fresh water for cooling purposes by power plants which it licenses only where alternative water supply sources and alternative cooling technologies are shown to be 'environmentally undesirable' or 'economically unsound.'"

Water Source is Considered Fresh Inland Water

The examination of alternative water supplies and technologies is triggered under the state's water policy when a power plant proposes to use "fresh water" (IEPR Water Policy 2003 p. 41). The IEPR itself does not define what constitutes fresh water. Resolution 75-58, upon which the IEPR water policy is based, defines fresh inland waters as "those inland waters which are suitable for use as a source of domestic, municipal, or agricultural water supply…" (State Water Resources Control Board Resolution 75-58, p. 3.) Thus, fresh water is not given a narrow definition but is broadly defined by how it is used, evincing an intent to be as inclusive as possible. City engineers for both Mendota and Firebaugh confirm that the lower aquifer groundwater in question is being used for domestic municipal supply, and it is also currently being used when needed for agricultural irrigation in the area. The Westlands Water District is one of the largest agricultural water delivery agencies in the nation, providing water to 600 family-owned farms in the Central Valley. However, even with contractual entitlements for the CVP, there is insufficient water to irrigate the entire District; thus, groundwater pumping is still required (WWD 2006). The groundwater proposed to be used by PEC clearly meets the definition of fresh inland water under Resolution 75-58.

Additionally, this groundwater qualifies as drinking water under SWRCB Resolution 88-63, "Adoption of Policy Entitled 'Sources of Drinking Water.'" The resolution states that "all surface and ground waters of the State are considered to be suitable, or potentially suitable, for municipal or domestic water supply" unless certain specified exceptions apply. One exception that is applicable is where the water has a total dissolved solids ("TDS") level of at least 3,000 mg/l and is not reasonably expected by the Regional Water Quality Control Boards to supply a public water system (Resolution 88-63). The groundwater proposed to be used by PEC has a TDS criteria level of 820-1,100 mg/l (PEC 2007h). The groundwater does not meet the SWRCB Resolution 88 – 63 of a TDS level equal to or greater than 3,000 mg/l.

Another indication of the suitability of this water as a domestic source is its compliance with the Drinking Water Standards found in Title 23 of the California Code of Regulations. The lower aquifer groundwater proposed for use by PEC is equivalent to the secondary maximum contaminant level (MCL) for TDS (and well below the short-term limit of 1500 mg/l) (Cal. Code Regs., tit. 23, §§64431, 64449). Secondary MCLs are aesthetics based and intended to protect odor, taste and appearance. Exceeding these levels does not restrict the use of this water for drinking.

Another issue related to the SWRCB Resolution No. 75-58 is the declaration by the applicant that the lower aquifer groundwater is "brackish" water, therefore, its use of the lower aquifer groundwater is reasonable according to the principles of the SWRCB Resolution 75-58 (Principle 1). Despite the applicant's contention, staff has concluded

that the groundwater does not meet the definition of brackish water which generally has a high TDS level including dissolved salts, thus giving the water a high salinity content. Resolution 75-58 defines brackish waters as "all waters with a salinity range of 1,000 to 30,000 mg/l ***and*** a chloride concentration range of 250 to 12,000 mg/l." Based on data from PEC's wells, the groundwater proposed to be pumped by PEC ranges from 820 to 1100 mg/l TDS and the most recent chloride levels are around 47 mg/l. These low chloride levels do not cross the threshold required to deem the water brackish and the low TDS levels are at the very bottom of the TDS range. Based on this data, staff does not consider the groundwater to be pumped by PEC as brackish water.

Although the lower aquifer groundwater is not by definition brackish, even if it were, nothing in Resolution 75-58 or elsewhere indicates that the definitions are mutually exclusive. To the contrary, under Resolution 88-63, water that would meet Resolution 75-58's definition of brackish is still deemed suitable for agricultural supply, and is thus considered fresh water under Resolution 75-58's definition.

Resolution 75-58 is clearly intended to broadly protect beneficial uses of the State's water resources. In this vein SWRCB states that "in considering issuance of a permit or license to appropriate water for powerplant cooling, the Board will consider the reasonableness of the proposed water use when compared with other present and future needs for the water source and when viewed in the context of alternative water sources that could be used for the purpose" (Resolution 75-58, pgs. 5 & 6). Thus, the Energy Commission must consider not just whether the groundwater meets the strict definition of brackish, but the reasonableness of allowing PEC to use lower aquifer groundwater when such water is needed for municipal and domestic water supply as well as for agricultural activities. Moreover, a source of lower quality water (3000 TDS) is available from the upper aquifer, which may be a reasonable alternative to the lower aquifer groundwater.

Alternative Water Supply

As discussed above, the Energy Commission may not approve the use of fresh water where alternative water supply sources or alternative cooling technologies are economically feasible and would not be environmentally undesirable. As an alternative to the lower aquifer groundwater, staff has identified the upper aquifer groundwater as a possible alternative to the proposed use of the lower aquifer groundwater. The upper aquifer groundwater is a reasonable alternative to the lower aquifer groundwater for the PEC because it is higher in TDS, salinity and chloride concentrations, which by definition, constitutes "brackish" water. Additionally, the upper aquifer groundwater is not considered "fresh inland water" within the meaning of Resolution 75-58 because it is not a suitable source of domestic, municipal, or agricultural water supply due to the high TDS and salinity levels. Therefore, the upper aquifer groundwater is a potential alternative to the applicant's proposed use of fresh water. Moreover, the use of the upper aquifer groundwater would not cumulatively impact municipal water supplies as the upper aquifer is not considered suitable for domestic or municipal water supply, and is not ideal for agricultural use due to the salinity. Additionally, the relatively minimal PEC groundwater pumping from the upper aquifer is unlikely to have a quantitatively adverse impact on land subsidence. The applicant has stated that this option is economically unsound. The applicant maintains that upper aquifer water is higher in

TDS than the proposed lower aquifer groundwater and would cost more to use due to additional equipment needs and cleaning processes. The applicant estimates additional capital costs to be $12M and additional annual operation and maintenance costs to be $2.9M.

Another alternative water supply identified by staff is the wastewater generated by the City of Mendota. Currently, the City of Mendota generates a million gallons a day (mgd) of wastewater. The City anticipates generating an additional 500,000 gallons a day (gpd) of wastewater once the Mendota Federal Prison is opened within the next three years, as well as an additional 500,000 gpd soon there after, totaling 2.0 million gallons a day. This wastewater level is within the range identified by the PEC for water usage. Wastewater generated by the City of Mendota is higher quality water than that of the lower aquifer groundwater; however, it would still need to be processed for use at the PEC. Nonetheless, the wastewater generated by the City of Mendota may be a reasonable alternative to the proposed lower aquifer potable groundwater. The City of Mendota is currently expanding the ponding capacity of their sewage plant in order to lessen the burden of excess wastewater; however, even with the expansion, the City of Mendota would still have a significant amount of wastewater with limited means of disposal. As such, the usage of the City of Mendota's wastewater by the PEC would potentially be beneficial to both the applicant as well as the City. Staff has not fully evaluated the 12-mile pipeline that would be required but does not foresee significant impacts. The City has indicated a willingness to work with the applicant to address recycled water use (Giersch, 2007).

Dry Cooling

In addition to an alternative water supply, state water policy requires the investigation of alternative cooling technologies. Dry cooling is one such technology that has been used in several power plants in California and elsewhere and would greatly reduce the project's annual water use each year. Dry cooling technology would replace the use of water cooling towers for cooling the gas turbine intercooler of the four (4) LMS 100 natural gas-fired combustion turbine generators. The intercooling system reduces the temperature of the compressed air in the gas turbine compression cycle, increasing cycle efficiency. The economic soundness and technical feasibility of dry cooling has been demonstrated several times with the construction of facilities using just such technology including Sutter, Crockett and Otay Mesa. Dry cooling has been characterized by the applicant as an option which has a costly efficiency penalty in very hot weather; however, several dry cooling facilities have been operating or are currently under construction in California and Nevada, where air temperatures are similar to those experienced in the San Joaquin Valley. A 480 MW facility is currently operating in Boulder City and two facilities, a 1,200 MW and a 575 MW facility, are currently being constructed outside of Las Vegas.

The use of dry cooling for PEC may be economically sound. There are three aspects to a project to take into consideration when performing an economic analysis; the initial capital costs of constructing the facility, the ongoing operation and maintenance costs, and any change in the cost of production. From a capital investment standpoint, a dry cooling facility is reasonably comparable to the cost of a wet cooling facility. Some costs would be reduced, resulting from not having to pump and treat groundwater and not

having to finance a Water Conservation Offset Program. See below for additional discussion of the offset program. The applicant submitted its analysis that it would cost approximately $70 million to build a dry-cooled facility because a fifth CTG would be needed to meet contractual power output during very hot weather.

Use of dry cooling would decrease efficiency, resulting in the loss of some power, which otherwise could be sold. It is difficult to specify the exact cost of production due to dry cooling because many variables are involved in determining a particular plant's cost of production, including the uniqueness of each plant, what future market rates are likely to be, and weather variation.

The applicant has offered various arguments as to how dry cooling would impinge on its ability to respond to market needs or operate flexibly in order to respond to conditions as they arise. Staff agrees that there is some reduction in operational capability, but believes costs may be overstated and is uncertain that this reduction makes dry cooling economically unsound.

At this time staff considers, recycled water from the City of Mendota, upper aquifer water, and dry-cooling viable alternatives.

Process and Sanitary Wastewater

PEC has applied to the Environmental Protection Agency (EPA) for an Underground Injection Control (UIC) permit to drill and use underground injection wells for disposal of wastewater. The EPA has accepted the application as complete and in discussions with staff has indicated a high likelihood of issuance prior to the proposed start of construction. This method of wastewater disposal complies with the zero liquid discharge off-site goals of the Energy Commission's 2003 IEPR and various other state water policies. Staff finds this disposal method acceptable and includes Condition of Certification **SOIL & WATER-6,** which requires Waste Discharge Requirements from the Regional Water Quality Control Board and the UIC permit prior to site mobilization.

Sanitary waste disposal will be via a septic system and leach field and must comply with Fresno County Department of Public Works and Planning requirements (Condition of Certification **SOIL & WATER-5**).

CUMULATIVE IMPACTS AND MITIGATION

Cumulative impacts consist of impacts that are created as a result of the proposed project in combination with impacts from other past, present and reasonably foreseeable future projects. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over time.

Temporary and permanent disturbances associated with construction of the proposed project would cause accelerated wind and water induced erosion. However, staff has concluded that the implementation of proposed mitigation measures, the SWPPP and DESCP would ensure that the proposed project would not contribute significantly to cumulative erosion and sedimentation impacts.

Wastewater streams would be eliminated by the use of the deep well injection. No wastewater-related cumulative impacts are expected.

The PEC proposes to use groundwater (1,154 acre-ft per year) from the lower aquifer for industrial and cooling water uses. In addition to PEC, there are several other projects that are proposed in western Fresno County. These include the proposed Starwood Power Plant, the U.S. Department of Justice, Federal Bureau of Prisons, Medium Security Prison, prison employee-related housing developments of approximately 300 units, a housing development of 400 units recently approved, increases for agricultural pumping activities due to decreased Delta outflow, drought, and domestic groundwater supply increases in the Cities of Mendota and Firebaugh, all of which may diminish the availability of groundwater to the PEC project. The proposed Starwood would use upper aquifer groundwater as its water source, while the prison and housing developments would use treated lower aquifer groundwater supplied by the City of Mendota. The anticipated maximum daily consumption of upper aquifer groundwater by Starwood is approximately 144,000 gallons a day, while the anticipated daily consumption of lower aquifer groundwater by the prison is 650,000 gallons a day.

California's Governor declared a drought emergency in adjoining Kings County on June 23, 2007, due to low water tables, limited precipitation, and crop damage due to drought conditions. The westernmost portions of Kings County are part of the Westlands Water District and share the lower aquifer that is proposed to be used. Kings County was granted a drought designation by the US Department of Agriculture on May 9, 2007 (Governor, 2007). Kern County Water Agency officials issued an emergency declaration on June 13, 2007, in response to losing two-thirds of the water they receive from Delta outflows and drought conditions. The Kern County Board of Supervisors declared a State of Emergency on June 25, 2007, due to water shortages.

The PEC proposed groundwater usage, in combination with the proposed groundwater usage by the prison, current drought-related increases for agricultural pumping activities, severe decreases (65%) in Delta outflow of surface water deliveries, and the increases of groundwater usage by the cities, would be a significant cumulative impact on existing groundwater water supplies. Therefore, staff is proposing that Condition of Certification **SOIL & WATER–7** be applied to PEC to prohibit the use of lower aquifer groundwater to avoid this impact.

With the implementation of additional Conditions of Certification **SOIL & WATER-7 through 10,** staff concludes that the PEC project would mitigate or eliminate any potential adverse impacts caused by water use during construction and operation of the project.

COMPLIANCE WITH LORS

CLEAN WATER ACT

Staff has determined that the PEC project would satisfy the requirements of the General National Pollutant Discharge Elimination System (NPDES) Permit with the adoption of conditions of certification **SOIL & WATER-1 and 3**, which requires the development and implementation of a SWPPP for construction and industrial activity.

CALIFORNIA CONSTITUTION, ARTICLE X, SECTION 2

The State Constitution requires that the water resources of the state be put to beneficial use to the fullest extent possible and states that the waste, unreasonable use or unreasonable method of use of water is prohibited. Staff concludes that the PEC does not comply with the terms of the California Constitution, Article X, Section 2 regarding water supply.

PORTER-COLOGNE WATER QUALITY CONTROL ACT

Staff has concluded that the PEC project will satisfy the requirements of the Porter-Cologne Water Quality Control Act if the project is constructed and operated as proposed, as wastewater would not leave the project site. Therefore, staff has determined that PEC would be consistent with terms of the Porter-Cologne Water Quality Control Act.

SWRCB POLICY 75-58

SWRCB Policy 75-58 states that fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. Staff finds that the lower aquifer groundwater, by definition, is fresh inland waters; therefore, the PEC use of the lower aquifer groundwater for power plant cooling would not comply with SWRCB Policy 75-58.

The SWRCB policy also calls for water availability studies for projects to be constructed in the Central Valley to consider potential impacts of Delta outflow, groundwater pumping and water quality objectives. The San Joaquin Valley is currently experiencing drought conditions and reduced Delta outflows which have triggered increased agricultural pumping. The PEC's use of groundwater combined with primary uses (i.e., increased agricultural pumping and municipal supply) could increase the likelihood of subsidence to resume. The proposed use of the lower aquifer groundwater could have a significant environmental effect by its contribution to overpumping of one of the few remaining western San Joaquin Valley, fresh inland water aquifers (Giersch, 2007). Commission staff concurs with the significance of this environmental impact.

WARREN-ALQUIST ACT

The project proposes to use fresh inland groundwater with a maximum usage of 1,154 acre-feet of lower aquifer groundwater per year. The Warren-Alquist Act promotes all feasible means of water conservation. The proposed project could conserve water through design features that have not been proposed by the applicant, such as using dry-cooling. Water conservation technology, reclaimed water, and lower quality upper aquifer groundwater are alternative options that are available. However, the project owner does not propose to use either option due to higher costs, which staff believes may be overstated. Therefore, staff cannot conclude that the PEC, as proposed, complies with the Warren-Alquist Act.

ENERGY COMMISSION - INTEGRATED ENERGY POLICY REPORT: POWER PLANT WATER USE & WASTEWATER DISCHARGE POLICY

The California Energy Commission, under legislative mandate specified in the 2003 Integrated Energy Policy Report (IEPR), will approve the use of fresh water for cooling

purposes by power plants it licenses only where alternative water supply sources and alternative cooling technologies are shown to be “environmentally undesirable” or “economically unsound”. Staff believes that the PEC project as proposed does not comply with this policy.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received comments from the Cities of Mendota and Firebaugh relating to the proposed water supply and its impact on their municipal water supplies and the availability of reclaimed water from the Mendota sewage plant.

CONCLUSIONS

Based on its assessment of the proposed PEC project, staff makes the following findings:

- Potential adverse impacts caused by erosion and stormwater flows during construction and operation would be mitigated with the development and implementation of an effective Storm Water Pollution Prevention Plan and a Drainage, Erosion and Sedimentation Control Plan;
- The proposed water supply for the project is not consistent with state water policy regarding use of fresh inland waters for power plant cooling or the Warren-Alquist Act regarding water conservation;
- Potential adverse impacts from the processing of wastewater or the use and storage of hazardous materials would be avoided with the adoption and implementation of an effective Hazardous Materials Management Program and Storm Water Pollution Prevention Plan; and

Based on these findings, staff concludes that PEC would result in unmitigated project-specific and cumulatively significant adverse environmental impacts to soil or water resources. As proposed the PEC would not comply with all applicable LORS.

The primary issue identified by staff in this assessment is the proposed use of fresh inland groundwater from the lower aquifer for the PEC. This use is inconsistent with state water policies. Staff believes the applicant has several alternatives. These alternatives are:

1. using low quality water from the upper aquifer;
2. using wastewater from the City of Mendota; or
3. using dry-cooling, thereby significantly reducing the amount of water needed.

Staff intends to continue to work with PEC to resolve the water supply issues.

PROPOSED CONDITIONS OF CERTIFICATION

SOIL & WATER-1: The project owner shall comply with the requirements of the General National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Storm Water Associated with Construction Activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan for the construction of the entire PEC project (Construction SWPPP).

Verification: The project owner shall submit copies to the Compliance Project Manager (CPM) of all correspondence between the project owner and the Regional Water Quality Control Board (RWQCB) regarding the General NPDES permit for the Discharge of Storm Water Associated with Construction Activities within 10 days of its receipt (when the project owner receives correspondence from the RWQCB) or within 10 days of its mailing (when the project owner sends correspondence to the RWQCB). This information shall include copies of the Notice of Intent sent to the State Water Resources Control Board, and the Notice of Termination for the project.

SOIL & WATER-2: Prior to site mobilization, the project owner shall obtain CPM approval for a site-specific Drainage, Erosion and Sedimentation Control Plan (DESCP) that ensures protection of water quality and soil resources of the project site and all linear facilities for both the construction and operations phases of the project. This plan shall address appropriate methods and actions, both temporary and permanent, for the protection of water quality and soil resources, demonstrate no increase in off-site flooding potential, include a stormwater retention basin to capture any stormwater potentially leaving the site, meet local requirements, and identify all monitoring and maintenance activities. The DESCP shall contain the following elements:

- ***Vicinity Map*** – A map shall be provided indicating the location of all project elements with depictions of all significant geographic features to include watercourses, washes, irrigation and drainage canals, and sensitive areas.
- ***Site Delineation*** – The PEC site and all project elements shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.
- ***Watercourses and Critical Areas*** – The DESCP shall show the location of all nearby watercourses including washes, irrigation and drainage canals, and drainage ditches. Indicate the proximity of those features to the PEC construction site.
- ***Drainage*** – The DESCP shall provide a topographic site map showing all existing, interim and proposed drainage systems; drainage area boundaries and water shed sizes in acres; and the hydraulic analysis to support the selection of Best Management Practices (BMPs) to divert offsite drainage around or through the site and laydown areas. On the map, spot elevations are required where relatively flat

conditions exist. The spot elevations and contours shall be extended off-site for a minimum distance of 100 feet in flat terrain.

- ***Clearing and Grading*** – The plan shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross sections or other means. The locations of any disposal areas, fills, or other special features shall also be shown. Illustrate existing and proposed topography tying in proposed contours with existing topography. The DESCP shall include a statement of the quantities of material excavated or filled for each element of the Panoche project (for example, project site, transmission corridors, and pipeline corridors), whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported or a statement explaining that there will be no clearing and/or grading conducted for each element of the PEC Project.
- ***Project Schedule*** – The DESCP shall identify on the topographic site map the location of the site specific BMPs to be employed during each phase of construction (initial grading, project element excavation and construction, and final grading/stabilization). Separate BMP implementation schedules shall be provided for each project element for each phase of construction.
- ***Best Management Practices*** – The DESCP shall show the location, timing, and maintenance schedule of all erosion and sediment control BMPs to be used prior to initial grading, during project element excavation and construction, final grading/stabilization, and post-construction. BMPs shall include measures designed to control dust and stabilize construction access roads and entrances. The maintenance schedule should include post-construction maintenance of treatment control BMPs applied to disturbed areas following construction.
- ***Erosion Control Drawings*** -- The erosion control drawings and narrative must be designed and sealed by a professional engineer/erosion control specialist.

Verification: No later than 90 days prior to start of site mobilization, the project owner shall submit a copy of the plan to Fresno County for review and comment, and a copy to the CPM no later than 60 days prior to the start of site mobilization for review and approval. The CPM shall consider comments received from Fresno County. During construction, the project owner shall provide an analysis in the monthly compliance report on the effectiveness of the drainage, erosion and sediment control measures and the results of monitoring and maintenance activities. Once operational, the project owner shall provide in the annual compliance report information on the results of monitoring and maintenance activities.

SOIL & WATER-3: The project owner shall comply with the requirements of the General NPDES Permit for Discharges of Storm Water Associated with

Industrial Activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan for the operation of the PEC site (Operational SWPPP).

Verification: At least 30 days prior to commercial operation, the project owner shall submit copies to the CPM of the Operational SWPPP for the entire PEC site. Within 10 days of its mailing or receipt, the project owner shall submit to the CPM any correspondence between the Project Owner and the RWQCB about the General NPDES permit for Discharge of Storm Water Associated with Industrial Activity. This information shall include a copy of the Notice of Intent sent by the project owner to the State Water Resources Control Board and the Notice of Termination. A letter from the RWQCB indicating that there is no requirement for a General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity will satisfy this condition.

SOIL & WATER-4: The project owner will comply with Chapter 15.48 of Title 15 of the Fresno County Ordinance Code, regarding flood hazard and base flood elevation.

Verification: The project owner will submit a letter from Fresno County to the CPM in which it is stated that the project has complied with the counties flood elevation requirements. Proof of compliance must be provided to the CPM prior to the start of site mobilization. A letter from Fresno County in which it is stated that the project is not within a flood hazard area can satisfy this condition.

SOIL & WATER-5: The project owner will comply with the Fresno County Department of Health and Safety, Fresno County Ordinance Code 8.50.050 4-B, regarding permits for sanitary waste disposal facilities such as septic systems and leach fields.

Verification: The project owner will submit a letter from Fresno County in which it is stated that the project has complied with the counties sanitary waste disposal facilities requirements. Proof of compliance must be provided to the CPM sixty days prior to the start of operation.

SOIL & WATER-6: The project owner shall provide the CPM with evidence of Waste Discharge Requirements (WDR) from the RWQCB and a Class 1 Non-hazardous UIC permit for four injection wells issued by U. S. Environmental Protection Agency (EPA) prior to any site mobilization activities. The project owner must comply with the specific conditions regarding the construction and operation of the injection wells including the water quality requirements for wastewater, sampling, analysis, and monitoring for the deep injection wells.

Verification: Thirty days prior to site mobilization, the project owner will obtain and submit to the CPM a copy of final WDRs issued by the RWQCB and the final approval of the UIC Class 1 Permit issued by USEPA Region IX for the construction and operation of the deep injection well. Changes to the design, construction or operation of the deep injection wells permitted by the WDRs and UIC Class 1 Permit during either construction or operation will be noticed in writing to the CPM, RWQCB and USEPA Region IX. During the life of the project, the Project Owner will provide the CPM with the annual monitoring report summary required by the WDRs and UIC Class 1 Permit, and

will fully explain violations, exceedances, enforcement actions or corrective actions. The project owner will notify the CPM in writing of changes to the WDRs or UIC Class 1 Permit that are instituted by either the Applicant, RWQCB or USEPA Region IX, including permit renewals.

The following Conditions of Certification may be modified or eliminated depending on what water supply or cooling option is approved. Staff has also included a Water Conservation Off-Set Plan (WCOP) Condition of Certification.

SOIL & WATER-7: Water used for the PEC shall not be lower aquifer groundwater, nor shall the water supply for the PEC significantly impact other water users.

Verification: The project owner, in the annual compliance report, shall provide a water-accounting summary for PEC that states the source and quantity of water used on a monthly basis in units of gallons per minute and on an annual basis in units of acre-feet. If the amount of water that is to be used by PEC will exceed 2,250,000 gallons a day or 1,154 Acre-feet per year during any annual reporting period, the project owner shall provide a written request and explanation for the anticipated water-use increase to the CPM sixty (60) days prior to the date when the water-use limit is expected to be exceeded. If the project owner can demonstrate that the requested increase is necessary and is not caused by wasteful practices or malfunctions in the water processing systems, the CPM shall approve an up to one-year increase in the water-use limit for the period requested.

SOIL & WATER-8: If the project owner uses upper aquifer groundwater, he/she shall conduct well tests in each of the new project wells to determine the drawdown-discharge characteristics of each well. Each well shall be tested separately. The project owner shall also conduct an aquifer test in the project area of each groundwater sub-basin from which groundwater is produced using the new wells to determine the site-specific aquifer parameters of transmissivity and storativity for each sub-basin. The aquifer test(s) will use one of the new wells as the pumping well and the other new well in that sub-basin as the observation wells. The test period shall be long enough to produce stable, measurable drawdown in the observation wells.

Verification: The result of the well tests will be provided to the CPM sixty days prior to the start of operation. Thirty days prior to conducting the well or aquifer testing, the project owner will submit to the CPM a work plan for well and aquifer testing for review and approval. Following approval of the work plan by the CPM, the project owner will conduct well tests on each of the new project wells and will conduct an aquifer test on the groundwater sub-basin from which groundwater is produced. All tests will be in accordance with the protocols established in the work plan. Sixty days following completion of the well and aquifer tests, the project owner shall submit to the CPM a Well and Aquifer Test report for review and approval. The report will include all of the data collected during the testing, include the analyses of data, and describe the results of testing, the drawdown-discharge characteristics of each of the new project wells, and the calculated values for transmissivity and storativity for the project area for each groundwater sub-basin from which groundwater is produced. The report shall include a description of the results of the test, the test procedure, the raw data and the calculation

of aquifer parameters. All impacts to other water users will be fully mitigated. The mitigation to be determined by the CPM prior to the start of operation.

SOIL & WATER-9: If the project owner uses upper aquifer groundwater, he/she shall measure and record static, non-pumping groundwater levels in the onsite project wells on a monthly basis for the first six months following project start up, and thereafter on a quarterly basis.

Verification: The project owner shall include a summary report of the ground water levels in the annual compliance report that will be submitted to the CPM and to the Westlands Water District and/or the Cities of Mendota and Firebaugh.

SOIL & WATER-10: The project owner will provide the results of annual chemical analyses of groundwater from at least one of the project wells for the groundwater sub-basin from which water is pumped. The analytes will include primary and secondary general minerals and physical parameters, volatile organic compounds, and semi-volatile organic compounds. If a comparison of analyses from one sampling period to the next indicates that there is a significant increase in the concentration of one or more of the chemical compounds in the groundwater, the need for additional pretreatment of water will be reassessed. The need for pretreatment of groundwater prior to use by the project will be based on incompatibility with the WDRs or deep injection well permit, exceedances of air emissions standards, worker safety standards, or standards of exposure of downwind receptors.

Verification: Sixty days following project start up, and annually thereafter for a total of five years, the project owner will submit a Report of Groundwater Quality Monitoring to the CPM that presents the results of the required analyses in a summary format. The need for additional pretreatment of water will be assessed on an ongoing basis. The need for continued monitoring will be reassessed at the end of the five-year period.

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TRAFFIC AND TRANSPORTATION

James Adams

SUMMARY OF CONCLUSIONS

The Panoche Energy Center (PEC) would be consistent with the Circulation Element in the Fresno County General Plan and all other applicable laws, ordinances, regulations, and standards (LORS). The project would not have a significant adverse impact on the local and regional road/highway network. During the construction and operation phases, local roadway and highway demand resulting from the daily movement of workers and materials would not increase beyond significance thresholds established by Fresno County. During the operational phase, the project would not adversely affect local roads or aviation operations associated with any airport flight traffic or agricultural spraying operations.

INTRODUCTION

In the Traffic and Transportation analysis, staff addresses the extent to which the project may impact the transportation system in the local area. This analysis includes the identification of: (1) the roads and routings that are proposed to be used for construction and operation; (2) potential traffic-related problems associated with the use of those routes by construction workers and truck deliveries; (3) the anticipated encroachment upon public rights-of-way during the construction of the proposed project and associated facilities; (4) the frequency of trips and probable routes associated with the delivery of hazardous materials; and (5) the possible effect of project operations on local airport flight traffic.

In addition to assessing potential project related impacts, staff has reviewed the applicable LORS to determine compliance. The LORS that govern the project are listed below in **Traffic and Transportation Table 1**, followed by a discussion of the potential impacts related to traffic operations and safety hazards resulting from the construction and operation of the PEC.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

TRAFFIC AND TRANSPORTATION Table 1
Laws, Ordinances, Regulations, and Standards

Applicable LORS	Description
Federal:	
Code of Federal Regulations (CFR) Title 14, Chapter 1, Part 77	Includes standards for determining obstructions in navigable airspace. Sets forth requirements for notice to the Federal Aviation Administration of certain proposed construction or alteration. Also, provides for aeronautical studies of obstructions to air navigation to determine their effect on the safe and efficient use of airspace.
Title 49, Subtitle B	Includes procedures and regulations pertaining to interstate and intrastate transport (includes hazardous materials program procedures), and provides safety measures for motor carriers and motor vehicles who operate on public highways.
State:	
California Vehicle Code, Division 2, Chapter. 2.5, Div. 6, Chap. 7, Div. 13, Chap. 5, Div. 14.1, Chap. 1 & 2, Div. 14.8, Div. 15	Includes regulations pertaining to licensing, size, weight and load of vehicles operated on highways, safe operation of vehicles, and the transportation of hazardous materials.
California Streets and Highway Code, Division 1 & 2, Chapter 3 & Chapter 5.5	Includes regulations for the care and protection of State and County highways, and provisions for the issuance of written permits.
Local:	
Fresno County General Plan – Transportation and Circulation Element.	Reflects the urban and rural nature of Fresno County and establishes standards that guide the development of the transportation system, and management of access to the highway system by new development, throughout the unincorporated areas of the county. Roadways are classified in this system based on the linkages they provide, their function in the hierarchy of roadways, and the importance of the route's service to the residents and businesses of Fresno County.

SETTING

The PEC site is located on West Panoche Road about two miles east of Interstate 5 (I-5) in western Fresno County. The facility would be located south of and adjacent to an existing PG&E substation and the Wellhead and Calpeak generating stations. **Traffic and Transportation Figure 1, Regional Transportation System** (transportation figures are located at the end of this analysis) shows the region surrounding the project site.

Plant construction and operation traffic would use the existing roadways, which would include I-5 and West Panoche Road. I-5 is the principal highway in the area and has Level of Service (LOS) B for daily traffic levels. Access to the site would be via West Panoche Road, which is operating at LOS A with free flowing traffic. The local roadways that could be affected by the PEC are shown in **Traffic and Transportation Figure 2, Local Transportation Network.** There are no bicycle lanes or trails in the immediate vicinity. Access to the site would be from West Panoche Road. The critical roads, highways, and transit modes in the area of the project are identified below (PEC, LLP 2006a, pp. 5.11-3 & 11-4).

CRITICAL HIGHWAYS AND ROADS

I-5 is a north-south four-lane freeway that connects the Central Valley with Northern and Southern California. Caltrans records show average daily traffic volume on I-5 in the project area (between Russell and Manning Avenues) is about 35,400 vehicles per day (Caltrans 2007). About 25 to 30% of the daily traffic involves truck movement. There are three interchanges in the project area at Manning Avenue, West Panoche Road, and Russell Avenue. Russell and Manning Avenues are the roads immediately north and south of West Panoche Road, respectively. Russell is a north-south oriented two-lane road and Manning is an east-west road with two lanes as well.

West Panoche Road is a two-lane east-west road that provides access to the PEC site from I-5 and also connects to the local road system to the east. Heading east from I-5, it has unimproved shoulders 10-15 feet wide before one encounters transmission towers, telephone poles and agricultural fields. West Panoche Road carries about 1,060 vehicles per day with 15% truck traffic. It also connects with the local circulation network to the east that accesses communities such as Mendota (north), Kerman (east), and further east to Fresno via State Route (SR)-33 and SR-180.

LEVEL OF SERVICE

"Level of Service" (LOS) is a qualitative measure describing operational conditions within a traffic stream. The LOS is a term used to describe and quantify the congestion level on a particular roadway or intersection, and generally describes these conditions in terms of such factors as speed, travel time, and delay. The Highway Capacity Manual[1] defines six levels of service for roadways or intersections ranging from LOS A representing the best operating conditions and LOS F the worst.

Traffic and Transportation Table 2 provides existing daily and peak traffic volume and levels of service (LOS) in the project area. It demonstrates that roadways in the project vicinity operate at LOS A and B. As noted below, West Panoche Road has free flowing traffic as exemplified by the LOS A both east and west of the proposed PEC site. The Manning to Russell Avenue section of I-5 has a LOS B. Fresno County tries to maintain LOS C as a general goal (Fresno County 2000) and the current LOS B for I-5 is acceptable to Caltrans (Caltrans 2007).

[1] National Research Council, Highway Capacity Manual, Third Edition, 1994.

TRAFFIC AND TRANSPORTATION Table 2
Roadway Segment Traffic Volume and LOS

Roadway Segment	Volume	LOS (AM/PM)
I-5 - Manning Avenue to Russell Avenue	35,398[2]	B
West Panoche Road – I-5 to PEC site	41/73 (AM/PM Peak Hour) 1,057[3]	A/A
West Panoche Road – East of PEC site	52/69	A/A

Source: PEC 2006a, Table 5.11-2, Pg. 5.11-5

AIRPORTS

Eagle Field Airport, a private facility, is located about fourteen miles north of the PEC site. Additional aviation facilities include Fresno Chandler Airport (thirty five miles east), and Lemoore Naval Air Station (forty miles southeast). The project site is not in the landing or take-off pattern of any of these facilities. However, the project would be located within the Military Operational Airspace of the Lemoore facility. There are no agricultural airstrips in the project area.

PUBLIC TRANSPORTATION

There is no rail or bus service in the general area around the PEC site. However, there is a school bus that takes 18-25 children who live in the local area to and from school in the City of Mendota (CEC 2007), which is about 12 miles northeast of the PEC site. The pick-up and drop-off point is 500-600 feet east of the intersection of West Panoche Road and the PEC access road.

RAILROADS

The major rail line in the vicinity of PEC site is the Southern Pacific Railroad which provides freight service to numerous markets in Central California and beyond. The rail line is about twelve miles east of the project site and connects communities from Volta to the north and Helm to the south (see **Traffic and Transportation Figure 1**). The Atchison & Topeka Railroad has a rail line that parallels State Route 99 about thirty five miles east of the project site.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project may have a significant effect on traffic and transportation if the project would:

- cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the

[2] Caltrans 2007 – Average Daily Traffic (ADT) for 2006.

[3] ADT, PEC 2006a, pg. 5.11-3

number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);

- exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways;
- result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- 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 emergency access; or
- result in inadequate parking capacity; or conflict with adopted policies, plans, or programs.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Construction Impacts and Mitigation

When evaluating a project's potential impact on the local transportation system, staff uses LOS determinations as the foundation on which to base its analysis. The following discussion identifies potential traffic impacts associated with the construction of the PEC, and provides an explanation of the impact conclusion.

The AFC provides an analysis of projected traffic conditions with the addition of project construction traffic trips. Project construction is expected to be completed in 14 months. Construction is expected to commence in January 2008 with commercial operation scheduled to begin on or before August 1, 2009 (PEC 2006a, pg. 2-2). All plant construction workers would park on an eight acre parcel of land directly south of the PEC site (PEC 2006a, pg. 5.9-6). This would also serve as a laydown area for materials and equipment (see Figure 3.4-1 in the AFC for parcel location). Staff has determined that the parking area is adequate for the number of construction workers involved in the project.

Construction Workforce Traffic

To determine the amount of vehicle trips to the project site during average and peak construction, the applicant assumed that workers would commute alone during the morning and afternoon peak intervals (7 to 9 AM and 4 to 6 PM). The average number of construction workers would be approximately 180, while the peak workforce would consist of 383 workers (including 19 substation expansion workers) during a three month period. Given experience with previous projects, staff believes that the estimated construction traffic trips and assumptions about peak construction activity are reasonable. Based on regional demographics and availability of skilled laborers, the construction workers would probably come from Fresno County. However, staff believes that some workers could come from Madera, Tulare, and Kings Counties.

To reach the project site, the applicant assumes construction workers coming from Fresno County would use I-5 and exit onto West Panoche Road. They would then go east until reaching the PEC access road. A right turn (heading south) would lead to the project site. Staff believes that PEC construction workers could travel on several other

state highways to reach the SPP site via I-5, such as SR-152 (north of Fresno), and SR-198 (south of Fresno). Workers living in or near the City of Fresno could travel east on SR-180 to reach SR-33 and then proceed south on SR-33 to Panoche Road. Staff has reviewed Caltrans information and has determined that the LOS for these state routes were LOS A to C (acceptable) when last rated. Staff does not anticipate that construction traffic would degrade LOS on these roads. Staff has asked Caltrans for the most recent information about existing LOS and road design capacity, and if received in a timely manner, the information will be provided in the Final Staff Assessment (FSA).

Construction Truck Traffic

Construction of the generating plant would require the use and installation of heavy equipment and associated systems and structures. Heavy equipment would be used throughout the construction period, including trenching and earthmoving equipment, forklifts, cranes, cement mixers and drilling equipment. A passenger car equivalent (PCE) factor of three cars per truck was used to determine the traffic impacts of trucks and heavy equipment deliveries (National Research Council 1994). Project construction is expected to require seven trucks on average and fifteen trucks during peak construction (PCE of 21 and 45, respectively) per day (URS 2007a). In-bound and out-bound truck traffic would arrive and depart the project site using the same route as construction workers.

Total Construction Traffic

Total average construction traffic impact (workforce and trucks) would be 201 vehicle trips (180 workers plus 21 PCE for trucks and deliveries), or 402 one-way vehicle trips. Total peak construction traffic impact would be 428 vehicle trips (383 workers plus 45 PCE for trucks and deliveries), or 856 one-way vehicle trips. The average construction total is about a 38% increase in traffic (peak construction total is about an 81% increase) when compared to 2005 average daily traffic counts (1,060). The applicant has agreed that if required, a traffic and transportation control plan will be prepared in coordination with Fresno County and Caltrans (PEC 2006a, pg. 5.11-16). However, the LOS (A) on West Panoche Road would not degrade during construction and therefore staff is not proposing a construction traffic control plan at this time. Staff is proposing Condition of Certification **TRANS-1** to repair any damage to West Panoche Road from construction traffic, particularly heavy trucks.

Linear Facilities

Approximately 2,400 feet of 16-inch diameter pipeline would deliver natural gas to the project site. The pipeline would be installed along the east side of the PEC site and would not impact West Panoche Road. The pipeline would connect to a PG&E line east of the existing substation (PEC 2006a, pg. 1-3). Water for all the project needs would be supplied by existing wells onsite. About 300 feet of new 230-kV transmission line for interconnection to the adjacent substation would be constructed within the project site boundaries.

Construction Phase Transport of Hazardous Materials and Waste

Deliveries to the PEC site would include small quantities of hazardous materials to be used during project construction. The applicant has stated that the delivery/disposal of

hazardous materials (one to three times per month [URS 2007e]) to and from the site, and materials handling on site would be conducted in accordance with all applicable federal and state statutes (see the **Hazardous Materials Management** section of this assessment for more information). The preferred transportation route for hazardous materials delivery would be via I-5, West Panoche Road, and PEC access road. Staff believes this is a reasonable route to access the site since it is the shortest and most direct route from I-5.

School Bus Route

As noted earlier, a bus from the Mendota Unified School District picks up and drops off children to and from school on the south side of West Panoche Road about 500-600 feet east of the intersection of West Panoche Road and the access road to the PEC site. There is a big enough shoulder on the south side of West Panoche Road to allow the bus to get off the road completely. Morning pick-up is 7:15 AM and afternoon drop-off is 3:45 PM. Other than the children who live in the 5-plex residence, the remaining 15-20 children from the local area are driven to, or picked up at the bus stop by parents or friends, who wait for the bus to arrive (Mendota Unified School District 2006). The children are bused to school in the City of Mendota. In addition, the school bus also travels west to two other pick-up and drop-off locations on the west side of I-5 (PEC 2007).

Workers using I-5 would travel east until reaching the PEC access road, and would not go by the school bus parked off the road. Departing workers in the afternoon would drive north on the PEC access road and turn left on West Panoche Road to reach I-5. They would not pass by the school bus parked to the east. Workers departing to travel east in the afternoon would drive north on the PEC access road and turn right on West Panoche Road to reach SR-33 and SR-180, and would pass by the bus stop east of the PEC access road. The school bus could encounter construction worker traffic when it travels east or west on West Panoche Road to and from the stops west of I-5. In addition, workers accessing the site in the morning from the east via SR-33 and SR-180 would pass by the bus stop east of the PEC access road.

Staff has been advised by Mendota Unified School District staff that, based on previous experience with another large construction project, there could be a potential hazard to the school bus en route to the I-5 stops (Mendota Unified School District 2007). However, the previous construction project involved widening a highway which required lane closures. Given the LOS A on West Panoche Road, the wide shoulder allowing the bus to pull completely off the roadway, and the fact that the project would not involve roadwork or lane closures, staff believes that project construction traffic would not pose a safety hazard to the children waiting for the school bus, or to the school bus as it passes the site.

Operation Impacts and Mitigation

Employee and Truck Traffic

Operation of the power plant would require a labor force of 12 full-time employees that would generate 24 one way trips to and from the PEC site. Other project-related trips (i.e. delivery trucks, visitors, and other business-related trips) are expected to be

minimal and would occur during regular business hours. Staff assumes that operational workers would follow the same routes as for construction. These minor trip additions to surrounding local streets and highways would not significantly affect the LOS of these roads.

Transport of Hazardous Materials and Waste

The transportation and handling of hazardous substances associated with the project can increase roadway hazard potential. Impacts associated with hazardous material transport to the facility can be mitigated to a level of insignificance by compliance with existing federal and state standards established to regulate the transportation of hazardous substances. The applicant intends to comply with all federal and state regulations related to the transportation of hazardous materials (PEC 2006a, pp. 5.11-17 - 21).

The California Department of Motor Vehicles specifically licenses all drivers who transport hazardous materials. Drivers are also required to check for weight limits and conduct periodic brake inspections. Commercial truck operators handling hazardous materials are also required to take instruction in first aid and procedures on handling hazardous waste spills. Drivers transporting hazardous waste are required to carry a manifest, which is available for review in the event of a spill, and is reviewed by the California Highway Patrol at inspection stations along major highways and interstates.

The California Vehicle Code and the Streets and Highways Code (Sections 31600 through 34510) ensure that the transportation and handling of hazardous materials are done in a manner that protects public safety. Enforcement of these statutes is under the jurisdiction of the California Highway Patrol.

Project operation would require use of hazardous substances including sulfuric acid and cleaning and water treatment chemicals. It is estimated that there would be a maximum of two truck trips every three months. In addition, there would be two special trick trips every three to five years when the plant is shut down for maintenance (URS 2007d). Operation would also require a maximum of four deliveries per month of aqueous ammonia. A licensed hazardous waste transporter would haul any hazardous waste from the project site to one of three Class 1 hazardous waste landfills in western Kern County near the communities of Buttonwillow and Kettleman City, and in Imperial County near the community of Westmoreland. The handling and disposal of hazardous substances are also addressed in the **Waste Management, Worker Safety and Fire Protection** and **Hazardous Materials** sections of this assessment.

Airport Operations

As noted earlier, the closest major airport is Eagle Field Airport which is fourteen miles north of the PEC site. The existing flight pattern does not bring aircraft at low altitude over the project site. The four combustion turbine generator stacks would be 90 feet high and the five cell cooling tower would be 42 feet high (PEC 2006a, Table 3.4-1, pg.3-5). The transmission line support tower would be 80 feet high. These structures would not penetrate navigable airspace for any airport.

The project would generate thermal plumes from turbine stacks (Aspen 2007a), but because of the high exhaust temperature (800ºF) the plumes would not be visible. The hot exhaust generated by a power plant can disturb atmospheric stability above the facility up to 1,000 above ground level, resulting in turbulence with the potential to affect aircraft maneuverability. However, staff has been advised that the agricultural fields near the project area are not sprayed by crop-dusting aircraft (URS 2007c). In addition, there are few (if any) aircraft that fly over or near I-5 in the project area (FAA 2007). Staff believes that the California Highway Patrol monitors traffic from the air and would probably remain directly above I-5 and not fly east toward the project site. Therefore, the PEC plumes would not affect local aircraft operations.

However, the project is located within Lemoore NAS's Military Operational Airspace. Representatives from the military have reviewed the project and have concluded that it would not have any impact on the military mission in the area (NAVAIR 2007).

Staff concludes that the proposed project would not cause a significant adverse impact on aircraft operations.

Emergency Services Vehicle Access

The Fresno County Fire Department would provide 24-hour fire protection and emergency medical services to the PEC site. The nearest fire station is in the City of Mendota about 15 miles northeast of the project site (Fresno County 2007). Emergency service vehicles would reach the project site via the access road off Panoche Road. For a more detailed discussion of emergency services concerning adequate ingress/egress serving the facility, see the **Worker Safety and Fire Protection** section in this assessment.

Ground Level Fogging of Roads

During certain meteorological conditions when the temperature is cold (30ºF), water vapor plumes from the cooling towers can be pushed down to the ground by strong winds. Staff has determined that there is a very minor potential for visible ground-hugging plumes from the cooling towers as currently designed (Aspen 2007b). Staff's Seasonal Annual Cooling Tower Impact modeling shows that the plumes would remain within the project fence line except for those blowing to the east-southeast. The maximum length of the plumes was predicted to be about 400 meters (1,275 feet). At this length, ground-hugging plumes would not cross West Panoche Road. Ground hugging plumes were predicted to form only two to three hours over a five year modeling period (Aspen 2007b). Therefore, staff believes that there would be no significant adverse traffic and transportation impact from ground-hugging plumes.

CUMULATIVE IMPACTS

In addition to the PEC, staff is analyzing the proposed Starwood Power-Midway project that would be located on the east side of the PG&E substation and northeast of the PEC site. Starwood construction would commence in June 2008, which is about six months after the PEC construction would begin. The Starwood project would involve an average of 75 workers and 7 truck trips per day. Corresponding peak numbers are 110 workers and 42 trucks (Starwood 2006a, pp. 5.11-6 through 11-9). With LOS A and B for West Panoche Road and I-5, the combination of workers and trucks for both projects arriving

and departing during peak traffic periods (7 to 9 AM and 4 to 6 PM) would not cause a cumulatively significant degradation in LOS.

A Federal Bureau of Prisons medium security Federal Correctional Institution (FCI) is slated to be built near Mendota, about 12 miles from the PEC site. Major construction of the new FCI was scheduled to begin in 2005 and completion was expected in 2008 (U.S. Department of Justice Federal Bureau of Prisons). Phase I was completed in March 2007 but the construction status of Phase II is unknown (CEC 2007y). There are no additional planned construction projects in this part of Fresno County.

Staff has considered the minority populations (as identified in **Socioeconomics Figure 1**) and low income populations in its impact analysis. There are no significant direct or cumulative traffic and transportation impacts, and therefore, no environmental justice issues.

COMPLIANCE WITH LORS

The applicant has stated its intention to comply with all applicable LORS (PEC 2006a, Section 5.11.5). Staff has concluded that the project as proposed would comply with relevant LORS. **Traffic and Transportation Table 3** presents the project's conformance with all applicable LORS.

TRAFFIC & TRANSPORTATION Table 3
Project Compliance with Adopted Traffic and Transportation LORS

Applicable LORS	Description
Federal: Code of Federal Regulations (CFR) Title 14, Chapter 1, Part 77	Includes standards for determining obstructions in navigable airspace. Sets forth requirements for notice to the Federal Aviation Administration of certain proposed construction or alteration. Also, provides for aeronautical studies of obstructions to air navigation to determine their effect on the safe and efficient use of airspace.
	Consistent: The project is not located within 20,000 feet of any airport and its structures would not penetrate any navigable airspace. The applicant is not required to file a "Notice of Proposed Construction or Alteration" with the FAA. In addition the project does not have any structure exceeding 200 feet in height which also triggers a notification to the FAA.
Title 49, Subtitle B	Includes procedures and regulations pertaining to interstate and intrastate transport (includes hazardous materials program procedures), and provides safety measures for motor carriers and motor vehicles who operate on public highways.
	Consistent: Enforcement is conducted by state and local law enforcement agencies, and through state agency licensing and ministerial permitting (e.g., California Department of Motor Vehicles licensing, Caltrans permits), and/or local agency permitting (e.g., Fresno County Department of Public Works).

State: California Vehicle Code, Division 2, Chapter. 2.5, Div. 6, Chap. 7, Div. 13, Chap. 5, Div. 14.1, Chap. 1 & 2, Div. 14.8, Div. 15	Includes regulations pertaining to licensing, size, weight and load of vehicles operated on highways, safe operation of vehicles, and the transportation of hazardous materials.
	Consistent: Enforcement is provided by state and local law enforcement agencies, and through ministerial state agency licensing and permitting, and/or local agency permitting.
California Streets and Highway Code, Division 1 & 2, Chapter 3 & Chapter 5.5	Includes regulations for the care and protection of State and County highways, and provisions for the issuance of written permits.
	Consistent: Enforcement is provided by state and local law enforcement, and through ministerial state agency licensing and permitting, and/or local agency permitting.
Local: Fresno County General Plan – Transportation and Circulation Element.	Reflects the urban and rural nature of Fresno County and establishes standards that guide the development of the transportation system, and management of access to the highway system by new development, throughout the unincorporated areas of the county. Roadways are classified in this system based on the linkages they provide, their function in the hierarchy of roadways, and the importance of the route's service to the residents and businesses of Fresno County.
	Consistent: The Fresno County General Plan's Circulation Element acknowledges that the road system in the project area should operate at LOS C or better. The local roads would meet the LOS standard with the addition of project related traffic.

CONCLUSIONS

1. The project as proposed would comply with all applicable LORS related to traffic and transportation, and would not degrade the LOS A and B on West Panoche Road and I-5.

2. Because of the distance from the nearest airports, minimal agricultural aviation (i.e., aerial spraying) activity, and no impact on the Lemoore NAS Military Operational Airspace, the project would not impact aviation safety.

3. Staff is proposing Condition of Certification **TRANS-1** which would require a mitigation plan to repair West Panoche Road if it is damaged by project related traffic.

4. There would be no significant direct or cumulative traffic and transportation impact and therefore no environmental justice issues.

PROPOSED CONDITION OF CERTIFICATION

TRANS-1 Prior to site mobilization activities, the project owner shall prepare a mitigation plan for West Panoche Road should it be damaged by project construction. The intent of this plan is to ensure that if West Panoche Road is damaged by project construction it will be repaired and reconstructed to original or as near original condition as possible. This plan shall include:

- Documentation of the pre-construction condition of West Panoche Road from I-5 to the access road to the site. Prior to the start of site mobilization, the project owner shall provide to the CPM photographs or videotape of West Panoche Road.
- Documentation of any portions of West Panoche Road that may be inadequate to accommodate oversize or large construction vehicles, and identify necessary remediation measures;
- Provide for appropriate bonding or other assurances to ensure that any damage to West Panoche Road due to construction activity will be remedied by the project owner; and
- Reconstruction of portions of West Panoche Road that are damaged by project construction due to oversize or overweight construction vehicles.

Verification: At least 90 days prior to the start of site mobilization, the project owner shall submit a mitigation plan focused on restoring West Panoche Road to its pre-project condition to the Fresno County Public Works and Planning Department for review and comment, and to the CPM for review and approval.

Within 90 days following the completion of construction, the project owner shall provide photo/videotape documentation to the Fresno County Planning Department, and the CPM that the damaged sections of West Panoche Road have been restored to their pre-project condition.

REFERENCES

Aspen 2007a. E-mail from Will Walters, Aspen Environmental Group, to James Adams, California Energy Commission, on January 8, 2007.

Aspen 2007b. E-mail from Will Walters to James Adams on March 26, 2007.

Caltrans 2007. Personal communication between Joe Espinoza, Region 6-Fresno, and James Adams on January 15, 2007.

CEC 2007a. E-mail from Che McFarlin, California Energy Commission, to James Adams on May 7, 2007.

CEC 2007y. Report of conversation by Che McFarlin, California Energy Commission, regarding status of federal correctional institution under construction near Mendota on March 5, 2007.

Fresno County 2000. Fresno County General Plan, Transportation and Circulation Element, dated October 2000.

Fresno County 2007. Personal communication between Brian Erickson, Fresno County Fire Department, and James Adams on May 3, 2007.

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PEC (Panoche Energy Center Project) 2007. Response to Panoche Energy Center Power Plant Project (06-AFC-5) Data Requests – Round 2. Submitted to the California Energy Commission on March 1, 2007.

TRB 2000. Transportation Research Board. Highway Capacity Manual 2000.

URS 2007a. E-mail from Noel Casil to James Adams on January 10, 2007.

URS 2007b. E-mail from Noel Casil to James Adams on January 18, 2007.

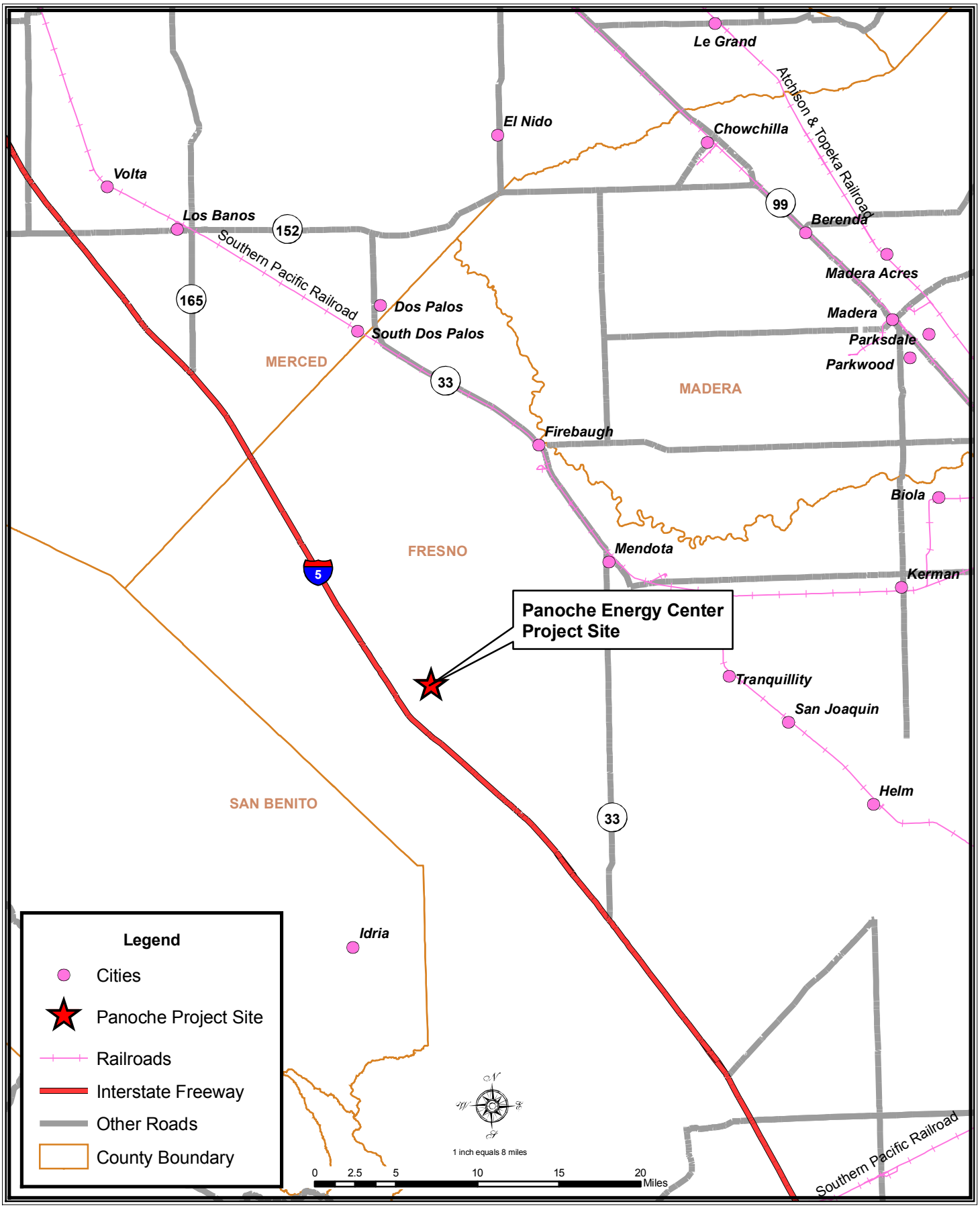
URS 2007c. Data responses in the Starwood Power proceeding (06-AFC-10). Docketed at the California Energy Commission on March 12, 2007.

URS 2007d. E-mail from Noel Casil to James Adams on June 22, 2007.

URS 2007e. Personal communication between Noel Casil and James Adams on June 11, 2007.

TRAFFIC AND TRANSPORTATION - FIGURE 1

Panoche Energy Center - Regional Transportation System

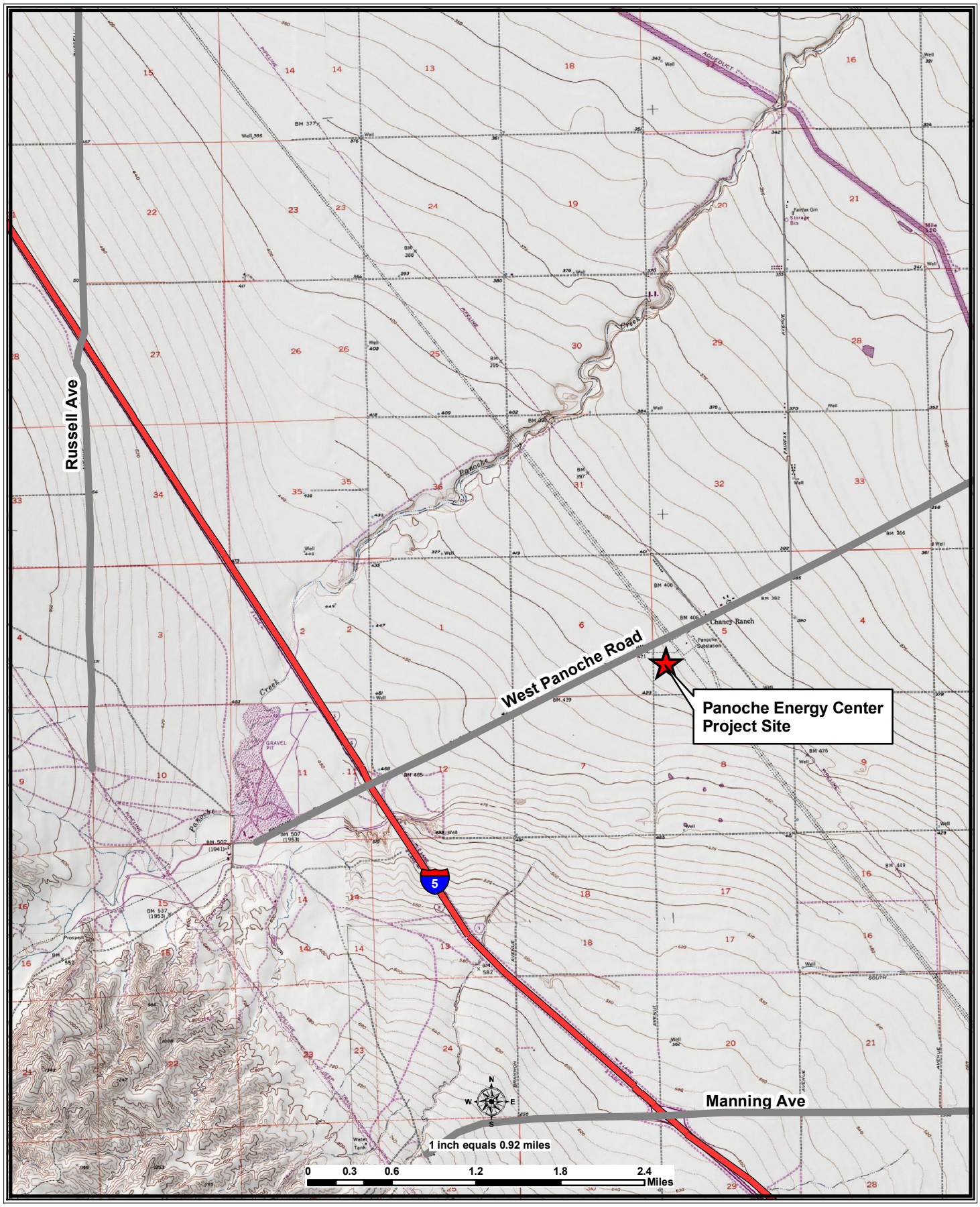


CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2007

SOURCE: California Energy Commission and TIGER Files

TRAFFIC AND TRANSPORTATION - FIGURE 2

Panoche Energy Center - Local Transportation Network



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2007

SOURCE: California Energy Commission and TOPO Map

TRANSMISSION LINE SAFETY AND NUISANCE

Obed Odoemelam, Ph.D.

SUMMARY OF CONCLUSIONS

The applicant, Panoche Energy Center, LLC proposes to transmit the power from the proposed Panoche Energy Center (PEC) to the Pacific Gas and Electric (PG&E) electric transmission grid through a new 300-foot, overhead 230-kilovolt (kV) transmission line connecting the facility with the adjacent PG&E Panoche Substation. The proposed line would traverse a mostly agricultural area with two nearby power generating facilities and related lines in which there are no nearby residences within 500 feet. This distance thereby eliminates the potential for residential electric and magnetic field exposures that in recent years have raised concern about human health effects. The proposed line's design, erection, operation, and maintenance plan would be according to standard PG&E practices, which conform to applicable laws, ordinances, regulations and standards (LORS). With the five proposed conditions of certification, any line-related safety and nuisance impacts would be less than significant.

INTRODUCTION

The purpose of this analysis is to assess the proposed line design and operational plan to determine whether its related field and non-field impacts would constitute a significant environmental hazard in the area around the proposed route. All related health and safety laws LORS are currently aimed at minimizing such hazards. Staff's analysis focuses on the following issues as related primarily to the physical presence of the line, or secondarily to the physical interactions of its 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.

The following federal, state, and local laws and policies apply to the control of the field and non-field impacts of electric power lines. Staff's analysis examines the project's compliance with these requirements.

TRANSMISSION LINE SAFETY AND NUISANCE (TLSN) Table 1
Laws, Ordinances, Regulations and Standards (LORS)

Applicable LORS	Description
Aviation Safety	
Federal:	
Title 14, Part 77 of the Code of Federal Regulations (CFR),"Objects Affecting the Navigable Air Space"	Describes the criteria used to determine the need for a Federal Aviation Administration (FAA) "Notice of Proposed Construction or Alteration" in cases of potential obstruction hazards.
FAA Advisory Circular No. 70/7460-1G, "Proposed Construction and/or Alteration of Objects that May Affect the Navigation Space"	Addresses the need to file the "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA in cases of potential for an obstruction hazard.
FAA Advisory Circular 70/460-1G, "Obstruction Marking and Lighting"	Describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.
Interference with Radio Frequency Communication	
Federal:	
Title 47, CFR, Section 15.2524, Federal Communications Commission (FCC)	Prohibits operation of devices that can interfere with radio-frequency communication.
State:	
California Public Utilities Commission (CPUC) General Order 52 (GO-52)	Governs the construction and operation of power and communications lines to prevent or mitigate interference.
Audible Noise	
Local:	
Fresno County General Plan, Noise Element	References the County of Fresno Ordinance Code for noise limits.
Fresno County Ordinance Code, Noise Control, Section 8.40.040	Sets sound level limits at residences and outdoor activity areas.
Fresno County Ordinance Code, Noise Control, Section 8.40.060	Restricts the hours of construction activities.

Hazardous and Nuisance Shocks	
State:	
CPUC GO-95, "Rules for Overhead Electric Line Construction"	Governs clearance requirements to prevent hazardous shocks, grounding techniques to minimize nuisance shocks, and maintenance and inspection requirements.
Title 8, California Code of Regulations (CCR) Section 2700 et seq. "High Voltage Safety Orders" National Electrical Safety Code	Specifies requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment. Specifies grounding procedures to limit nuisance shocks. Also specifies minimum conductor ground clearances.
Industry Standards:	
Institute of Electrical and Electronics Engineers (IEEE) 1119, "IEEE Guide for Fence Safety Clearances in Electric-Supply Stations"	Specifies the guidelines for grounding-related practices within the right-of-way and substations.
Electric and Magnetic Fields	
State:	
GO-131-D, CPUC "Rules for Planning and Construction of Electric Generation Line and Substation Facilities in California" CPUC Decision 93-11-013	Specifies application and noticing requirements for new line construction including EMF reduction. Specifies CPUC requirements for reducing power frequency electric and magnetic fields.
Industry Standards:	
American National Standards Institute (ANSI/IEEE) 644-1944 Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines	Specifies standard procedures for measuring electric and magnetic fields from an operating electric line.
Fire Hazards	
State:	
14 CCR Sections 1250-1258, "Fire Prevention Standards for Electric Utilities"	Provides specific exemptions from electric pole and tower firebreak and conductor clearance standards and specifies when and where standards apply.

SETTING

As noted in the **Project Description** section, the site for the proposed PEC is a 12.8-acre portion of a 128-acre land parcel approximately 50 miles west of the City of Fresno and approximately 300 feet southwest of PG&E's Panoche Substation. The line would be located within the PEC site and the PEC property boundaries that are in an agricultural area with no nearby residences within 500 feet. This distance means that there would not be the types of long-term human EMF exposures mostly responsible for the health concern of recent years. The only project-related EMF exposures of potential significance are the short-term exposures of plant workers, regulatory inspectors, maintenance personnel, visitors, or individuals in the immediate vicinity of the line. These types of exposures are short term and well understood as not significantly related to the health concern.

PROJECT DESCRIPTION

The proposed PEC transmission line will consist of the segments listed below:

- An overhead 230-kV line extending approximately 300 feet from the project's 230-kV switchyard to the connection point at PG&E's Panoche Substation immediately to the northeast; and
- The project's on-site 230-kV switchyard from which the conductors would extend to the connection points at the Panoche Substation, which would be expanded to accommodate the added power.

The proposed line's conductors would be standard low-corona 795 aluminum steel reinforced cables to be erected on H-or A-frame-type support structures, which would allow for a 50-ft clearance from the ground. The applied design and construction would be in keeping with PG&E guidelines necessary to ensure line safety and efficiency together with reliability, and maintainability.

The line would exit from the northeast corner of the project site and run northeast for approximately 300 feet to the connection points within the Panoche Substation. There would be no public access to the proposed line or related switchyard since the line would be within the property boundaries of PEC and the and Panoche Substation, which connects other area 115 kV and 230 kV lines to the PG&E transmission grid.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

The potential magnitude of the line impacts of concern in this staff analysis depends on compliance with the listed LORS. The LORS have been established to maintain impacts below levels of potential significance. Thus, if staff determines that the project would comply with applicable LORS, we would conclude that any transmission line-related safety and nuisance impacts would be less than significant. The nature of these individual impacts is discussed below together with the potential for compliance with the LORS that apply.

DIRECT IMPACTS AND MITIGATION

Aviation Safety

Any potential hazard to area aircraft would relate to the potential for collision in the navigable airspace and the need to file a “Notice of Proposed Construction or Alteration” (Form 7640) with the FAA as noted in the LORS section. 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.

As noted by the applicant Panoche Energy Center, LLC (PEC 2006a, pp. 3-36 and 3-52), the height of the proposed line support towers would, at 65 feet, be much less than the 200 feet regarded by the FAA as triggering the concern about aviation safety. Furthermore, the line would be in an area with several other PG&E lines some of which are of similar voltage and structural dimensions. The nearest large public airport is in Fresno approximately 50 miles away and thus, farther than the 20,000 feet that triggers FAA notification. A small public general aviation airport, in Firebaugh (Firebaugh Airport) is located approximately 24 miles away. Lemoore Naval Air Station is approximately 40 miles southeast of the project. Given these conditions, staff considers the proposed line structures as not posing an obstruction-related aviation hazard to area aircraft as defined using current FAA criteria. Therefore, no FAA “Notice of Construction or Alteration” would be required.

Interference with Radio-Frequency Communication

Transmission line-related radio-frequency interference is one of the indirect effects of line operation and is produced by the physical interactions of line electric fields. Such interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as corona discharge, but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings. When generated, such noise manifests itself as perceivable interference with radio or television signal reception or interference with other forms of radio 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 level of any such interference usually depends on the magnitude of the electric fields involved and the distance from the line. The potential for such impacts is, therefore, minimized by reducing the line electric fields and locating the line away from inhabited areas.

The proposed line would be built and maintained in keeping with to standard PG&E practices that minimize surface irregularities and discontinuities. Moreover, the potential for such corona-related interference is usually of concern for lines of 345-kV and above, and not the proposed 230-kV line. The proposed low-corona designs are used for all PG&E lines of similar voltage rating to reduce surface-field strengths and the related potential for corona effects. Since these existing lines do not currently cause the corona-related complaints along their existing routes, staff does not expect any corona-related radio-frequency interference or related complaints in the general project area.

However, staff recommends Condition of Certification **TLSN-2** to ensure mitigation as required by the FCC in the unlikely event of complaints.

Audible Noise

The noise-reducing designs related to electric field intensity are not specifically mandated by federal or state regulations in terms of specific noise limits. As with radio noise, such noise is limited instead through design, construction or maintenance practices established from industry research and experience as effective without significant impacts on line safety, efficiency, maintainability, and reliability. Audible noise usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying, or hissing sound or hum, especially in wet weather. Since the noise level depends on the strength of the line electric field, the potential for perception can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during rainfall, but mainly from overhead lines of 345-kV or higher. It is, therefore, not generally expected at significant levels from lines of less than 345-kV as proposed for PEC. 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 right-of-way of 100 feet or more. Since the low-corona designs are also aimed at minimizing field strengths, staff does not expect the proposed line operation to add significantly to current background noise levels in the project area. For an assessment of the noise from the proposed line and related facilities, please refer to staff's analysis in the **Noise and Vibration** section.

Fire Hazards

The fire hazards addressed through the related LORS in **TLSN Table 1** 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.

Standard fire prevention and suppression measures for similar PG&E lines would be implemented for the proposed project line (PEC 2006a, pp. 3-35 and 3-36). The applicant's intention to ensure compliance with the clearance-related aspects of GO-95 would be an important part of this mitigation approach. **TLSN-4** is recommended to ensure compliance with important aspects of the fire prevention measures.

Hazardous Shocks

Hazardous shocks are those that could result from direct or indirect contact between an individual and the energized line, whether overhead or underground. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines.

No design-specific federal regulations have been established to prevent hazardous shocks from overhead power lines. Safety is assured within the industry from compliance with the requirements specifying the minimum national safe operating clearances applicable in areas where the line might be accessible to the public.

The applicant's stated intention to implement the GO-95-related measures against direct contact with the energized line (PEC 2006a, p. 3-39) would serve to minimize the

risk of hazardous shocks. Staff's recommended Condition of Certification **TLSN-1** would be adequate to ensure implementation of the necessary mitigation measures.

Nuisance Shocks

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's electric and magnetic fields.

There are no design-specific federal or state regulations to limit nuisance shocks in the transmission line environment. For modern overhead high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code (NESC) and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). For the proposed project line, the applicant will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way.

The potential for nuisance shocks around the proposed line would be minimized through standard industry grounding practices (PEC 2006a, p. 3-52). Staff recommends Condition of Certification **TLSN-5** to ensure such grounding.

Electric and Magnetic Field Exposure

The possibility of deleterious health effects from EMF exposure has increased public concern in recent years about living near high-voltage lines. Both electric and magnetic fields occur together whenever electricity flows, hence the general practice of describing exposure to them together as EMF exposure. The available evidence as evaluated by the CPUC, other regulatory agencies, and staff, has not established that such fields pose a significant health hazard to exposed humans. There are no health-based federal regulations or industry codes specifying environmental limits on the strengths of fields from power lines. Most regulatory agencies believe, as staff does, 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.

Staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore, considers it appropriate in light of present uncertainty, to recommend reduction of such fields as feasible without affecting safety, efficiency, reliability and maintainability.

While there is considerable uncertainty about EMF health effects, 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) 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 requires each utility within its jurisdiction to establish EMF-reducing measures and incorporate such measures into the designs for all new or upgraded power lines and related facilities within their respective service areas. The CPUC further established specific limits on the resources to be used in each case for field reduction. Such limitations were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Publicly owned utilities, which are not within the jurisdiction of the CPUC, voluntarily comply with these CPUC requirements. This CPUC policy resulted from assessments made to implement CPUC Decision 93-11-013.

In keeping with this CPUC policy, staff requires a showing that each proposed overhead line would 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 factors bearing on safety, reliability, efficiency, and maintainability. Therefore, it is up to each applicant to ensure that such measures are applied in ways that prevent significant impacts on line operation and safety. The extent of such applications would be reflected by ground-level field strengths as measured during operation. When estimated or measured for lines of similar voltage and current-carrying capacity, such field strength values can be used by staff and other regulatory agencies to assess the effectiveness of the applied reduction measures. These field strengths can be estimated for any given design using established procedures. Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m), for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends on line voltage (in the case of electric fields), the geometry of the support 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 by the CPUC to be designed according to the EMF-reducing guidelines of the electric utility in the service area involved, its fields are required under this CPUC policy to be similar to fields from similar lines in that service area. Designing the proposed project line according to existing PG&E field strength-reducing guidelines would constitute compliance with the CPUC requirements for line field management.

The CPUC has recently revisited the EMF management issue to assess the need for policy changes to reflect the available information on possible health impacts. The findings did not point to a need for significant changes to existing field management policies.

Industrial Standards

The present focus is on the magnetic field because only it can penetrate the soil, buildings and other materials to potentially produce the types of health impacts at the root of the health concern of recent years. As one focuses on the strong magnetic fields from the more visible overhead transmission and other high-voltage power lines, staff considers it important, for perspective, to note that an individual in a home could be exposed to much stronger fields while using some common household appliances (National Institute of Environmental Health Services and the U.S. Department of Energy, 1998). The difference between these types of field exposures is that the higher-level, appliance-related exposures are short-term, while the exposure from power lines are lower level, but long-term. Scientists have not established which of these types of exposures would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than around high-voltage power lines.

As with similar PG&E lines, specific field strength-reducing measures would be incorporated into the design of the proposed line to ensure the field strength minimization currently required by the CPUC in light of the concern over EMF exposure and health.

The field reduction measures to be applied include the following:

1. Increasing the distance between the conductors and the ground;

2. Reducing the spacing between the conductors;

3. Minimizing the current in the line; and

4. Arranging current flow to maximize the cancellation effects from interacting of conductor fields.

Since optimum field-reducing measures would be incorporated into the proposed line design, staff considers further mitigation to be unnecessary, but would seek to validate the applicant's assumed reduction efficiency from the field strength measurements recommended in Condition of Certification, **TLSN-3**.

CUMULATIVE IMPACTS AND MITIGATION

Since the proposed project transmission line and switchyard would be designed according to applicable field-reducing PG&E guidelines (as currently required by the CPUC for effective field management), staff expects that the resulting fields will have the same intensity as fields from PG&E lines of the same voltage and current-carrying capacity. Any contribution to cumulative area exposures should be at similar levels. It is this similarity in intensity that constitutes compliance with current CPUC requirements on EMF management. The actual field strengths and contribution levels for the proposed line design would be assessed from the results of the field strength measurements specified in Condition of Certification **TLSN-3**.

COMPLIANCE WITH LORS

As previously noted, current CPUC policy on safe EMF management requires that any high-voltage line within a given area be designed to incorporate the field strength-reducing guidelines of the main area utility lines to be interconnected. The utility in this case is PG&E. Since the proposed project line and related switchyard would be designed according to the respective requirements of GO-95, GO-52, GO-131-D, and Title 8, Section 2700 et seq. of the California Code of Regulations, and operated and maintained according to current PG&E guidelines on line safety and field strength management, staff considers the presented design and operational plan to be in compliance with the health and safety LORS of concern in this analysis. The actual contribution to the area's field exposure levels would be assessed from results of the field strength measurements required in Condition of Certification **TLSN-3**.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff received no public or agency comments.

CONCLUSIONS

Since the proposed lines and related facilities are not close enough to the nearest airport to pose an aviation hazard according to current FAA criteria, staff does not consider it necessary to recommend location changes on the basis of a potential hazard to area aviation.

The potential for nuisance shocks would be minimized through grounding and other field-reducing measures to be implemented in keeping with current PG&E guidelines (reflecting standard industry practices). These field-reducing measures would maintain the generated fields within levels not associated with radio-frequency interference or audible noise.

The potential for hazardous shocks would be minimized through compliance with the height and clearance requirements of PUC's General Order 95. Compliance with Title 14, California Code of Regulations, Section 1250, will minimize fire hazards while the use of low-corona line design, together with appropriate corona-minimizing construction practices, would minimize the potential for corona noise and its related interference with radio-frequency communication in the area around the proposed route.

Since electric or magnetic field health effects have neither been established nor ruled out for the proposed PEC and similar transmission lines, the public health significance of any related field exposures cannot be characterized with certainty. The only conclusion to be reached with certainty is that the proposed line's design and operational plan would be adequate to ensure that the generated electric and magnetic fields are managed to an extent the CPUC considers appropriate in light of the available health effects information. The long-term, mostly residential magnetic exposure of health concern in recent years would be insignificant for the proposed line given the general absence of residences along the proposed route. On-site worker or public exposure would be short term and at levels expected for PG&E lines of similar design

and current-carrying capacity. Such exposure is well understood and has not been established as posing a significant human health hazard.

Since the proposed project line would be operated to minimize the health, safety, and nuisance impacts of concern to staff while located along a route without nearby residences, staff considers the proposed design, maintenance, and construction plan as complying with the applicable laws. With the conditions of certification proposed below, any such impacts would be less than significant.

PROPOSED CONDITIONS OF CERTIFICATION

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

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

TLSN-2 The project owner shall ensure that every reasonable effort will be made to identify and correct, on a case-specific basis, any complaints of interference with radio or television signals from operation of the project-related lines and associated switchyards. The project owner shall maintain written records for a period of five years, of all complaints of radio or television interference attributable to plant 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 hire a qualified consultant to measure the strengths of the electric and magnetic fields from the line before and after it is energized. The measurements shall be made according to the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) standard procedures at the locations of maximum field strengths along the proposed route. These measurements shall be completed not later than six months after the start of operations.

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

TLSN-4 The project owner shall ensure that the rights-of-way of the proposed transmission line 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. 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 lines are energized, the project owner shall transmit to the CPM a letter confirming compliance with this Condition.

REFERENCES

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

Panoche Energy Center (PEC) 2005a. Application for Certification. Volumes I and II. Submitted to the California Energy Commission on August 2, 2006.

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.

VISUAL RESOURCES

Mark R. Hamblin

SUMMARY OF CONCLUSIONS

Staff analyzed visual resources related information for the Panoche Energy Center (PEC), and has concluded that with effective implementation of the mitigation measure(s) identified by the applicant and staff's recommended condition(s) of certification this project would not cause any direct, indirect, or and cumulative adverse visual resource impact, and would comply with applicable laws, ordinances, regulations, and standards (LORS) pertaining to visual resources.

INTRODUCTION

Visual resources are the viewable natural and man-made features of the environment. This analysis focuses on whether construction and operation of the PEC would cause an adverse visual impact(s) under the California Environmental Quality Act (CEQA) and whether the project would comply with applicable LORS.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

VISUAL RESOURCES Table 1 provides a general description of identified adopted federal, state, and local LORS pertaining to maintenance and protection of visual resources relevant to the proposed project. Staff's evaluation of the proposed project's conformance with the following LORS is discussed in **VISUAL RESOURCES Table 2**.

VISUAL RESOURCES Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal	The project site does not involve federal managed lands, a recognized National Scenic Byway or All-American Road, or a designated State Scenic Highway.
State	
Local	
County of Fresno	No adopted policies or ordinances applicable to the proposed project or site have been identified.

SETTING

The proposed PEC project would be built on the San Joaquin valley floor in western Fresno County, California in an expanse of agriculture. To the north, east, and south is a mosaic of irrigated farmland, orchards (pomegranates, other fruits, and nuts), and open space with scattered single family residences. To the west are U.S. Interstate 5 (I-5), a small area of highway service commercial related operations, farmland, rangeland, the Panoche Hills and Panoche Mountain (elevation 2,300 feet). Major concentrations of population are relatively isolated in the region. The closest population center is the City of Mendota which is approximately 15 miles east.

To the east of the project site is Pacific Gas & Electric (PG&E) Company's Panoche Substation, a 230-kilovolt (kV) electric substation. Further east, approximately 900 feet and 1,500 feet respectively are the operating CalPeak Power Panoche No. 2, a 49.5 megawatt (MW) peaking plant, and the Wellhead Power Panoche, a 49.9 MW peaking plant.

The proposed project site would be constructed on an approximate 13-acre (project site) portion of a 128-acre parcel (subject property). The subject property consists of a producing pomegranate orchard, approximately 6 to 8 feet in height, and operating electric generation facilities and infrastructure. A portion of the orchard is to be removed to allow the construction of the power plant and provide for a construction laydown area (see **VISUAL RESOURCES Figure 1** – Aerial View of Site and Vicinity).

The Panoche Hills Wilderness Study Area is the nearest recognized public use recreational area or facility to the PEC site. The wilderness study area is managed by the U.S. Department of the Interior, Bureau of Land Management. The wilderness study area consists of hilly rangeland and is primarily used for grazing. Hiking and backpacking also take place. The 11,229-acre area is about 5 miles west of the project site on the west side of I-5.

Power Plant

The most publicly visible components of the PEC would include: four 90-foot tall combustion turbine generator exhaust stacks, four 53-foot tall combustion turbine variable bleed valve (VBV) silencer stacks, a 44-foot tall raw water tank, and a 42-foot tall by 154-foot long 5-cell cooling tower, and four 40-foot tall combustion turbine inlet air filters (see **VISUAL RESOURCES Figure 2** – Plant Elevations Looking East and South).

Linear Facilities

The proposed project would interconnect to the Panoche Substation by a 300-foot long 230-kV overhead electric transmission line supported by four onsite 60-foot tall steel deadend structures, and a single steel tubular tower approximately 60-80 feet tall that would be located adjacent to the substation.

Natural gas would be supplied to the site by means of a new 2,400-foot long (approximate) underground pipeline connecting to a PG&E main gas line (Line 2) that runs north-south along the east side of the Panoche Substation.

Production water for the power plant would involve use of brackish lower aquifer groundwater supplied by two onsite wells. Potable water would also be provided by an onsite well. There would be no water lines that would enter the property.

Construction Laydown Area

During the construction period, the 8-acre construction laydown area which adjoins the south side of the project site would be used for vehicle parking, and the storage of construction equipment and materials. Vehicle access to the construction laydown area would be from West Panoche Road by a private road.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

To determine whether there is a potentially significant visual resources impact generated by a project, staff reviews the project using the CEQA Guidelines Appendix G Environmental Checklist pertaining to Aesthetics. The checklist questions include the following:

A. Would the project have a substantial adverse effect on a scenic vista?

B. Would the project substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?

C. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

D. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Staff evaluates the existing visible physical environmental setting from a fixed vantage point (called a "Key Observation Point" [KOP]), and the visual change introduced by the proposed project to the view from that KOP. The view as seen from the KOP is referred to as the viewshed. Staff uses a KOP[1] to represent a location(s) from which to conduct detailed analyses of the proposed project and to obtain existing condition photographs and prepare visual simulations. KOPs are selected to be representative of the most critical viewshed locations from which the project would be seen. Because it is not feasible to analyze all the views in which a proposed project would be seen, it is necessary to select KOPs that would most clearly display the visual effects of the proposed project. KOPs may also represent primary viewer groups that would potentially be affected by the project. In addition to KOP photo(s), staff reviews landscape character photos that help provide a visual overview of a project site, its vicinity, and the selected KOP area.

Staff also reviews federal, state, and local LORS and their policies or guidelines for the protection or preservation of visual resources that may be applicable to the project site and surrounding area. These LORS include local government land-use planning documents (e.g., General Plan, zoning ordinance).

Please refer to **APPENDIX VR-1** for a complete description of staff's Visual Resources evaluation process.

VISUAL RESOURCES Figure 3 - KOP Locations - shows the locations and view direction of the three selected KOPs for the proposed project and accompanying photo simulations of the proposed power plant structures after construction. Staff's analysis of

[1]The use of KOPs or similar view locations is common in visual resource analysis. The U.S. Bureau of Land Management (USDI BLM 1986a, 1986b, 1984) and the U.S. Forest Service (USDA Forest Service 1995) use such an approach.

each of the applicant's submitted KOPs is presented under Direct/Indirect Impacts and Mitigation section below.

DIRECT/INDIRECT IMPACTS AND MITIGATION

The impact discussion is presented under the following topics: scenic vista, scenic resources, visual character or quality, and light or glare.

A. SCENIC VISTA

CEQA checklist question: "Would the project have a substantial adverse effect on a scenic vista?"

A scenic vista for the purpose of this analysis is defined as a distant view through and along a corridor or opening that exhibits a high degree of pictorial quality. There are no scenic vistas in the KOP 1, KOP 2 and KOP 3 viewsheds. The proposed project would not cause a significant visual impact to a scenic vista.

B. SCENIC RESOURCES

CEQA checklist question: "Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway corridor?"

A scenic resource for the purpose of this analysis includes a unique water feature (waterfall, transitional water, part of a stream or river, estuary); a unique physical geological terrain feature (rock masses, outcroppings, layers or spires); a tree having a unique visual/historical importance to a community (a tree linked to a famous event or person, an ancient old growth tree); historic building; or a designated federal scenic byway or state scenic highway corridor.

In the KOP 1, KOP 2, and KOP 3 viewsheds there are no identified scenic resources. The proposed project would not cause a significant visual impact to a scenic resource.

C. VISUAL CHARACTER OR QUALITY

CEQA checklist question: "Would the project substantially degrade the existing visual character or quality of the site and its surroundings?" The project aspects evaluated under this criterion are broken down into two categories: 1) Construction Impacts; and, 2) Operation Impacts – Analysis From Key Observation Points and Publicly Visible Water Vapor Plumes.

Construction Impacts

Construction activities for the project would occur during an approximate 24-month period. Main activities that would be ongoing on the power plant construction site during the construction period include: the installation of the combustion turbine generators (CTGs) and power train foundations, erecting of the CTGs, the installation of pipe supports, liner plates and baffles and aboveground electrical, exhaust stack fabrication and condenser work, the installation of the cooling tower, aboveground tanks and prefabricated buildings. In addition, during the construction period, construction

materials, heavy equipment, trucks, modular offices, and parked vehicles would have limited public visibility on the eight acre temporary construction laydown area due to the surrounding pomegranate orchard obstructing ground level views. Upon the completion of the project's construction, the 8-acre laydown area is to be replanted with pomegranate trees (PEC 2006a, page 5.9-7).

Typically screening of onsite construction site activities is accomplished by attaching a fabric or adding wooden slats to a perimeter fence. This screening is effective in limiting ground level visual exposure of the construction site. However, this type of screening is not necessary because the proposed site is surrounded on all sides by orchard. Therefore, a condition to require construction site screening has not been proposed by staff.

Although the public visibility of the construction site and ground level activities on it are limited by the surrounding orchard, as project structures are erected that exceed the height of the orchard, they would become fully visually exposed. There are three residences located on the north side of West Panoche Road approximately 800 feet north of the construction site. At least one of these residences would be exposed for a temporary duration to a partial unobstructed view of on going construction activities taking place on the site. Specifically, residents would have an unscreened view of the tops of the project's tallest structures during the latter part of the construction period. The applicant has indicated that these residences would be vacant during the construction period.

During pipeline construction, the ground surface along the proposed alignments would be temporarily disrupted by the presence of construction equipment, excavated piles of dirt, concrete and pavement, and construction personnel and vehicles. After construction, the ground surfaces would be restored. The restored ground surfaces and buried pipelines would not create a change to the existing visual condition.

Construction activities would not result in a long-term visual degradation. Overall, the project's construction activities are considered to generate a less than significant visual effect.

Operation Impacts

Analysis From Key Observation Points

KOP 1 – Three Residences On North Side Of West Panoche Road

VISUAL RESOURCES Figure 4 represents the existing panoramic view from the front yard of one residence of a cluster of three single family residences that have frontage along the north side of West Panoche Road, approximately 800 feet north of the proposed power plant site. These residences are the closest to the project site.

Visual Sensitivity

The view from KOP 1 towards the proposed project site includes a portion of West Panoche Road, a pomegranate orchard, the 60-foot tall tubular steel skeleton structure of the Panoche Electric Substation, two 110-foot tall tubular steel electric overhead transmission line towers and wires, and six miles to the south a portion of the grass

covered Ciervo Hills (3,391 elevation). Typically, a view of a ridgeline within five miles is considered to be visually sensitive. The KOP 1 viewshed does not include a designated scenic resource or vista. The estimated public appeal of the visual impression (quality) of the KOP 1 viewshed is considered to be moderate.

Residential viewers are typically considered to be highly sensitive to modifications of a viewshed. From this KOP, a residential viewer is accustomed to a view of a pomegranate orchard. There is no focal point in the viewshed that draws the viewer's eye to a unique feature (e.g., rock outcropping, waterfall, historic building) in the viewshed. A portion of the viewshed is partially disrupted by existing tall tubular steel structures of the Panoche Substation (see **VISUAL RESOURCES Figure 5** – Landscape Character Photo Of Substation East Of Project Site). The steel structures introduce forms, lines, colors, and textures that do not conform to the agricultural setting shown in the viewshed. The estimated level of viewer concern towards preserving the existing KOP 1 viewshed is considered to be moderate.

The KOP 1 view shows a visually obstructed ground level view of the proposed project site. Currently, there is an orchard that buffers the view of the project site at ground level from the KOP location. The KOP 1 view towards the project site is obstructed to the degree of having a low visibility of the site. However, structures extending above the orchard would be highly visible (unobstructed view) to the KOP 1 location. Visibility is considered moderate. This KOP location represents the view from three single family residences that may have a view of structures on the project site. This number of potentially affected residences is considered to be low. The duration of view of the potential tops of the power plant structures from a residence(s) would be considered high (extended). Overall, residential view exposure is considered moderate.

West Panoche Road is an east-west two-lane road that provides highway ramp connections to I-5 to the west, and primary access to the cities of Mendota and Firebaugh to the east. The road lies approximately 500 to 775 feet north of the project site. The road is not shown as a scenic highway, scenic drive, or landscaped drive on the Fresno County-Designated Scenic Roadways (Fresno County General Plan, Open Space and Conservation Element, page 5-36). Motorists who are area residents traveling at normal speed typically have an increased awareness of views from local roads, particularly at points of entry to a community and along designated scenic roadways. The estimated level of viewer concern of motorists of the project site along this rural roadway is considered to be moderate.

The AFC states that the Average Daily Traffic (ADT) count of vehicle trips along the road segment of West Panoche Road between I-5 and the project site is 1,057 (PEC 2006a, page 5.11-3). If at least one individual per vehicle trip was exposed to a view of the project site with potential power plant structures, the estimated number of motorist view exposures would be considered to be moderately low. Staff visited the project site and estimates the duration of view for motorists traveling east on West Panoche Road in the immediate vicinity of KOP 1 to an exposure of potential power plant structures on the site to be one to two minutes (extended) which is considered to be moderate to high. Visibility is considered to be low for ground level views and high for above orchard height views. Overall exposure for motorists is considered to be moderate.

The overall visual sensitivity for residential viewers would be considered moderate from the KOP 1 location. This assessment is the result of a moderate visual quality, moderate viewer concern, and a moderate overall viewer exposure.

The overall visual sensitivity for motorists would be considered moderate from the KOP 1 location. This assessment is the result of a moderate visual quality, moderate viewer concern, and a moderate overall viewer exposure.

Visual Change

VISUAL RESOURCES Figure 6 represents a photo simulation of the proposed project's publicly visible structures after the completion of construction in the KOP 1 viewshed. Visually noticeable from the KOP 1 location would be the smooth steel vertical, cylindrical forms of the proposed project's 90-foot tall Unit 3 and Unit 4 stacks, and two of its 53-foot tall combustion turbine VBV silencer stacks. Also visible would be two of the 40-foot tall air inlet filters above the 6-8-foot height of the orchard.

From KOP 1, the stacks would extend into a skyline above rows of dark green small trees comprising the pomegranate orchard. The proposed non-reflective neutral gray color and smooth steel surfaces as shown in the photo simulation would introduce a degree of contrast. Though the contrast of the project structures could be seen, it would not attract attention (instantaneously draw eye movement towards it). When compared to existing manmade and natural elements in the KOP viewshed the contrast is considered moderately low.

The applicant shows in their photo simulations and architectural rendering that the exteriors of major project structures would be treated with a gray finish intended to optimize its visual integration with the surrounding agricultural setting (**VISUAL RESOURCES Figure 7** – Appearance of Project Site After Completion).

The photo simulation of the project structures shows their proportionate size relationship to other manmade and natural elements in the view. Project structures would occupy a small portion of the total field-of-view of KOP 1. In addition the structures would visually appear subordinate when compared to other elements in the KOP view. The relative visual scale of the structures as simulated in the KOP 1 viewshed is considered to be low.

The project would introduce publicly visible structures to the KOP viewshed, the degree of view disruption introduced by the structures is considered to be moderately low. There is no identified or designated scenic resource or vista in the KOP viewshed that would be blocked from view by project structures. A small portion of the view of the sky-line above orchard would be disrupted by the project from the KOP location.

Staff concludes that the introduction of the PEC structures would not substantially degrade the existing viewshed at KOP 1. When considering the overall visual sensitivity of the viewing groups at KOP 1(residential viewer [moderate]; motorist views [moderately low]; and overall visual change of low, the introduction of the proposed project's structures would generate a less than significant visual effect at this KOP.

KOP 2 – Five Residential Unit Apartment East Of Panoche Electric Substation

VISUAL RESOURCES Figure 8 represents the existing view from the backyard of a residential five unit apartment building that has frontage along the south side of West Panoche Road, approximately 1,500 feet east of the proposed power plant site.

Visual Sensitivity

The view from KOP 2 towards the proposed project site includes exposed arid soil that has annual, ruderal weeds and grasses, the 60-foot tall tubular steel skeleton structure of the Panoche Substation, several 110-foot tall electric overhead transmission line towers, several 50-75-foot tall metal and wood vertical poles and overhead transmission wires, orchard, and the Ciervo Hills six miles to the south. Open storage of electric generation and transmission equipment, cable, piping, and building materials are in the view. The power generation block of the Wellhead Peaker plant is seen. The KOP 2 viewshed does not include a scenic resource or vista. The estimated public appeal of the visual quality of the KOP 2 viewshed is considered to be low.

From this KOP, a residential viewer is accustomed to a backyard view that is industrial in appearance (see **VISUAL RESOURCES Figure 9** – Landscape Character Photo Of The Existing Backyard View). The panoramic view from the backyard has a visually unobstructed view of the CalPeak Power Panoche No. 2 plant, the Panoche Substation and the Wellhead Peaker Panoche plant. The Panoche Substation provides some visual disruption of the project site from this KOP location. There is no focal point in the viewshed that draws the viewer's eye to a unique feature in the viewshed. The steel vertical structures of the substation and other electricity generation facilities introduce forms, lines, colors, and textures that contrast and even conflict with other manmade elements in the view. The estimated level of residential viewer concern towards preserving the existing KOP 2 viewshed is considered to be low.

The KOP 2 view shows a visually obstructed and disrupted view towards the proposed project site from the apartment building. The view of the proposed project site is obstructed and disrupted by manmade structures to the degree of having what is considered to be a moderately low visibility from the KOP. The KOP represents the view from five residential units. This number of potentially affected residences is considered to be low. The duration of view to an exposure of power plant structures from the backyard of the residential units at the necessary view angle would be considered moderately low. Overall, residential viewer exposure is considered moderately low.

As previously noted the AFC states that the ADT count of vehicle trips along the road segment of West Panoche Road between I-5 and the proposed project site is 1,057 (PEC 2006a, page 5.11-3). The estimated level of viewer concern of motorists of the project site along this rural roadway is considered to be moderate. The estimated number of motorist view exposures is considered to be moderately low.

Staff visited the project site and estimates the duration of view for motorists traveling west on West Panoche Road at the legal speed limit through the KOP 2 viewshed to a potential exposure of the power plant site to be 10 to 20 seconds which is considered to be low to moderate. The apartment building, which fronts West Panoche Road, blocks a motorist ground level view of the front of the project site, and a neighboring fuel farm

disrupts a view of it. Surrounding orchards also disrupt the continuity of a motorist ground level view of the project site along this segment of West Panoche Road. The taller power plant structures would be visible from a greater distance. The visibility of the project site is considered to be moderate to high. Overall exposure for motorist is considered to be moderately low.

The overall visual sensitivity for residential viewers would be considered low from the KOP 2 location. This assessment is the result of a low visual quality, low viewer concern, and a moderately low overall viewer exposure.

The overall visual sensitivity for motorist would be considered low from the KOP 2 location. This assessment is the result of a low visual quality, low viewer concern, and a moderately low overall viewer exposure.

Visual Change

VISUAL RESOURCES Figure 10 represents a photo simulation of the proposed project's publicly visible structures after the completion of construction in the KOP 2 viewshed.

The proposed non-reflective neutral gray color and smooth steel flat finished surface of project structures as shown in the photo simulation would be obstructed by the Panoche Substation and disrupted by other structures in the view. The potential contrast introduced by project structures is considered to not be visible or perceived from this KOP. The degree of contrast introduced by the project's structures is diffused by other contrasting structures, and considered low when compared to existing manmade and natural elements in the KOP viewshed.

The photo simulation of the project structures shows the proportionate size relationship to other manmade and natural elements in the view. The project structures would occupy a small portion of the total field-of-view of KOP 2. In addition the structures would visually appear subordinate when compared to other elements in the KOP view. The relative visual scale of the structures as simulated in the KOP 2 viewshed is considered to be low.

The project would introduce publicly visible structures to the KOP viewshed, the degree of view disruption introduced by the structures is considered to be low. There is no identified or designated scenic resource or vista in the KOP viewshed that would be blocked from view by project structures. A small view of the pomegranate orchard would be partially disrupted by the project from the KOP location.

Staff concludes the introduction of the PEC structures would not substantially degrade the existing viewshed at KOP 2. When considering the overall visual sensitivity of the various viewing groups at KOP 2 (residential viewer [low]; motorist views [low]), and overall visual change of low, the introduction of the proposed project's publicly visible structures would generate a less than significant visual effect at this KOP.

KOP 3 – I-5 Overpass On West Panoche Road

VISUAL RESOURCES Figure 11 represents the view for motorists near the northbound I-5 on and off-ramps, near the top of an elevated overpass of I-5 on West

Panoche Road, two-miles west of the proposed project site. There are no residences at the KOP location.

Visual Sensitivity

The view from KOP 3 toward the proposed project site includes West Panoche Road, a highway off-ramp, a line of 110-foot tall tubular steel electric overhead transmission towers and wires, a windbreak consisting of a single row of 20 to 30-foot tall cypress trees, a variety of orchards, and a distant view of the skeleton structure of the Panoche Substation. The KOP 3 viewshed does not include a scenic resource or vista. The estimated public appeal of the visual quality of the KOP 3 viewshed is considered to be moderately low.

Interstate 5 is shown as a scenic highway within Fresno County by the County of Fresno. As a result of this county designation, intensive land development proposals along I-5 are required to be designed to blend into the natural landscape and minimize visual scarring of vegetation and terrain. In addition, the design of a proposed development is required to provide and maintain a natural open space area two hundred (200) feet in depth parallel to the right-of-way along the scenic roadway. The project site is approximately two miles away from I-5, therefore the county's scenic designation does not apply to the project site. Interstate 5 is not shown as an officially designated State scenic highway or, as a recognized County scenic highway by the State of California (d.b.a. Caltrans) on the California Scenic Highway System Mapping System.

Typically motorists on a freeway system such as I-5, have a moderate to low sensitivity to the visual environment due to their concentration on driving and their focus on their destination. From this KOP, a motorist coming off of I-5 would have an obstructed view of the project site by orchard. The transmission towers provide a focal point in the viewshed that draws the viewer's eye to it coming off the highway. The estimated level of viewer concern towards preserving the existing KOP 3 viewshed is considered to be moderately low.

There is a visually obstructed view towards the proposed project site from the West Panoche Road overpass. A view of the proposed project site is obstructed by orchards and non-native vegetation to the degree of having what is considered a moderately low visibility from the KOP. The AFC states that the ADT count of vehicle trips along the segment of I-5 near West Panoche Road is 51,500 (PEC 2006a, page 5.13-5). The estimated number of potential motorist exposures is considered to be high. A view of the project site from I-5 would be interrupted due to agricultural operations adjacent to and along the highway (**VISUAL RESOURCES Figure 12** – Landscape Character Photo of Proposed Project Site from Southbound Interstate 5, 2 miles west of the Project Site). Overall viewer exposure from I-5 is considered moderately low.

The ADT count of vehicle trips along the road segment of West Panoche Road between I-5 and the project site is 1,057 (PEC 2006a, page 5.11-3). The estimated level of viewer concern for motorist is considered low. The estimated number of potential motorist exposures is considered moderately low. The estimated duration of view for a motorist traveling east on West Panoche Road from I-5 to an exposure of potential

power plant structures on the site to be two minutes which is considered to be high. Overall viewer exposure from West Panoche Road is considered moderate.

The overall visual sensitivity for an I-5 motorist would be considered moderately low from the KOP 3 location. This assessment is the result of a moderately low visual quality, moderately low viewer concern, and a moderately low overall viewer exposure.

The overall visual sensitivity for West Panoche Road motorist would be considered moderately low from the KOP 3. This assessment is the result of a moderately low visual quality, moderately low viewer concern, and a moderately low overall viewer exposure.

Visual Change

VISUAL RESOURCES Figure 13 represents a photo simulation of the proposed project's publicly visible project structures after the completion of construction in the KOP 3 viewshed.

Barely visible from the KOP 3 location is the vertical, cylindrical form of the proposed project's 90-foot tall Units 1 and 2 exhaust stacks. The degree of contrast introduced by the project's structures is considered low when compared to existing manmade and natural elements in the KOP viewshed.

The photo simulation of the project's structures shows the proportionate size relationship to other manmade and natural elements in the view. The project structures would occupy a very small portion of the total field-of-view of KOP 3. In addition, the structures would visually appear subordinate when compared to other elements in the KOP view. The relative visual scale of the structures as simulated in the KOP 3 viewshed is considered to be low.

The project would introduce publicly visible structures to the KOP viewshed, the degree of view disruption introduced by the structures is considered to be low. There is no identified or designated scenic resource or vista in the KOP viewshed that would be blocked from view by project structures. A small view of the Panoche Substation would be partially disrupted by the project from the KOP location.

Staff concludes the introduction of the PEC structures would not substantially degrade the existing viewshed at KOP 3. When considering the overall visual sensitivity of the various viewing groups at KOP 3 (motorist views [moderately low for both I-5 and West Panoche Road]), and overall visual change of low, the introduction of the proposed project's structures would generate a less than significant visual effect at this KOP.

PUBLICLY VISIBLE WATER VAPOR PLUMES

Although not specifically identified in the Appendix G Environmental Checklist under Aesthetics, staff includes a separate analysis of the potential visual impact of water vapor plumes generated by the proposed power plant during operation.

When the proposed power plant is operated at times of low temperature and high humidity, the potential exists for the exhaust from its cooling towers to condense and form visible water vapor plumes (steam plume). Staff completed water vapor plume

modeling of the proposed project's cooling towers using design parameters provided by the applicant. The applicant has not proposed to use any methods to abate visible plumes from the cooling towers.

A plume frequency threshold of 20% of seasonal (typically from November through April) daylight no rain/fog high visual contrast (i.e. "clear") hours is used to assess a potential plume appearance impact significance. If it is determined that the seasonal daylight clear hour plume frequency is greater than 20% , then plume dimensions are determined and a significance analysis is included in the Visual Resources section of the Staff Assessment for the proposed project. Staff assesses the visual change in terms of contrast, dominance and view blockage that would be caused by the 20th percentile plume dimensions. Considering the visual sensitivity of the existing landscape and viewing characteristics, the degree of visual change caused by the plumes may result in significant visual impacts. Plume frequencies of less than 20% have been determined to generally have a less than significant impact. Please refer to **APPENDIX VR-2** at the end of this visual resources section for a more complete description of staff's visible plume modeling analysis. Staff did not prepare a photo simulation of the water vapor plumes for the project.

Staff estimated the proposed project's cooling tower plume frequencies and dimensions using the Combustion Stack Visible Plume (CSVP) model and five-years (1992-1995 and 1997) of meteorological data for Lemoore Naval Air Station obtained from the National Climatic Data Center. The project applicant has requested specific maximum quarterly operating limits. These limits are based on hours of operation per quarter as follows: 1st Quarter – 1,100 hours, 2nd Quarter – 1,100 hours, 3rd Quarter – 1,600 hours, and the 4th Quarter – 1,200 hours. Considering the requested quarterly operating limits and normal daily power demand curves, staff has determined a 12-hour operating schedule from 9:00 AM to 9:00 PM to represent a worst-case operating condition (please refer to **APPENDIX VR-2** at the end of this visual resources section for a more complete description for the selection of the worst-case operating profile). For this worst-case operating profile visible water vapor plumes from the project's cooling towers are predicted to have a plume frequency of 30.1% of the seasonal (November through April) daylight clear hours.

The 20th percentile plume dimensions from the proposed power plant's five-cell cooling tower are predicted to be 109 feet high, 63 feet wide, and 72 feet long. Since the proposed cooling towers are 42 feet tall, the effective plume height over the top of the cooling tower would be 67 feet. Staff considers the 20th percentile plume to be the reasonable worst case plume dimensions on which to base its visual impact analysis. The 20th percentile plume is the smallest of the plumes that are predicted to occur zero to 20% of the time. Eighty (80) percent of the time the dimensions of the clear hour plumes would be smaller than the 20th percentile plume dimensions. A one percentile clear hour plume would be extremely large (physical size) and very noticeable to a wide area. It occurs very infrequently. The 20th percentile plume dimensions for the project's cooling tower plumes are predicted to visually appear subordinate when compared to other elements in the KOP viewsheds.

The luminescence (light refraction resulting in a glare or glow) and color contrast of the plume and the background against which the plume is viewed exert an influence upon

its appearance. A plume is most visible and presents the greatest apparent opacity (the degree to which light is prevented from passing through an emission plume) when viewed against a contrasting background. Opacity of a plume lessens as the color and luminescence contrast decrease (EPA 1990, pg. 1). Staff analyzed the predicted plume size, its potential luminescence and color contrast, and opacity that may be introduced to the selected KOP viewshed(s).

The proposed project would introduce public visible water vapor plumes to the KOP 1, KOP 2, and KOP 3 viewsheds. In the KOP 1 viewshed is an uninterrupted backdrop of sky above the orchard. A stationary observer at this KOP location would be accustomed to a view of open sky. The predicted 67-foot tall whitish colored plume would introduce a color contrast to a bluish sky-line. In the KOP 2 viewshed, the view of a whitish plume would be disrupted by the structure(s) of the electric substation and other surface structures between the KOP location and the project site. In addition, the angle of the observer's view of a plume from the backyard of the residences, and the approximate 2,000 feet distance to the emission point (the cooling towers) would help to soften the contrast of the plume. A stationary observer at the KOP 3 location may be exposed to a partial view of a plume two miles away from the highway overpass (elevated location). The view would be disrupted by the line of electric transmission towers that pass from the foreground view to the background view along the south side of West Panoche Road. From KOP 3, the plume appearance would disappear (at least 80% of the time) below the height of the second transmission tower in the viewshed. There are no identified or designated scenic resources or vista in the KOP viewsheds that would be blocked from view by a plume(s).

The overall visual change generated by project's introduction of a publicly visible water vapor plume is considered low and would not substantially degrade the existing viewsheds at KOP 1, KOP 2 and KOP 3. The introduction of the proposed project's plume would generate a less than significant visual effect. Staff recommends **VIS-4** as a design and operation confirmation measure for the proposed cooling towers. If operated differently by the applicant the frequency percentage and size of the plumes could potentially change staff's conclusions.

The temperature of the gas turbine exhaust exceeds 740°F under normal operating conditions. From staff's experience gas turbines with exhaust temperatures of this magnitude would not form visible steam plumes under any meteorological conditions that might exist at the project site. Therefore, staff did not analyze the gas turbine exhaust stack further for potential visible plumes.

D. LIGHT OR GLARE

CEQA checklist question: "Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?"

Project construction activities would take place the majority of the time during daylight hours however, during the startup phase of the project some activities may occur 24 hours a day, 7 days a week. If there are periods when nighttime construction activities take place, illumination that meets state and federal worker safety regulations is to be used. The applicant's use of the minimal lighting necessary to conduct construction activities safely, and the use of lighting that is

shielded and highly directional would ensure that construction lighting impacts, if they occur, are kept to a less than significant level. Staff has proposed condition of certification **VIS-2** which limits lighting during construction.

The project during operation has the potential to generate light trespass offsite, and up-lighting to the nighttime sky. To reduce offsite lighting impacts, lighting at the facility will be restricted to areas required for safety, security, and operation. Exterior lights are to be hooded, and lights will be directed onsite so that significant light or glare would be minimized. For areas where lighting is not required for normal operation, safety, or security, switched lighting circuits are to be provided, thus allowing these areas to remain unilluminated (dark) at most times, minimizing the amount of lighting potentially visible offsite.

A lighting system for the project's exhaust stacks to address Federal Aviation Administration regulations is not necessary because the exhaust stacks (the tallest structures) would not exceed 200 feet in height, and the project site is in excess of 20,000 feet (3.8-miles) from an airport runway that is at least 3,200 feet in actual length.

With the effective implementation of proposed light mitigation measures, and the continued maintenance and operation of the orchard bordering the project site, staff believes that the operation of the PEC would not result in a substantial new source of light that could adversely affect existing nighttime views. Staff has proposed condition of certification **VIS-3** which limits lighting during operation and requires submittal of lighting control plan.

The photo simulations and the depiction of the completed power plant provided by the applicant show the use of a surface treatment on major project structures and buildings consisting of a neutral gray color and a flat finish. This finish would limit excessive glare. Staff concurs with the applicant's proposed surface treatment. With effective implementation of the applicant's proposed surface treatment, and the continued maintenance and operation of the orchard bordering the site, project structures would not be a source of substantial glare that could adversely affect existing daytime views. Staff has proposed condition of certification **VIS-1** which requires submittal of a surface treatment plan for the power plant structures and electric transmission line poles.

CUMULATIVE IMPACTS AND MITIGATION

As defined in Section 15355 of the CEQA Guidelines (California Code of Regulations, Title 14), a cumulative impact is created as a result of the combination of the project under consideration together with other existing or reasonably foreseeable projects causing related impacts. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. In other words, while any one project may not create a significant impact to visual resources including visible water vapor plumes, the combination of the new project with all existing or planned projects in an area may create significant impacts. The significance of the cumulative impact would depend on the degree to which (1) the viewshed is altered; (2) views of a scenic resource is impaired; or (3) visual quality is diminished.

The proposed PEC project would be built in western Fresno County, 15 miles east of the City of Mendota within an expanse of irrigated farmland, orchard, and open space with scattered residences. There is no identified scenic resource or vista in the KOP 1, KOP 2 and KOP 3 viewsheds that would be disrupted by the built project.

On adjoining properties to the east of the project site are the Panoche Substation, the CalPeak Power Panoche No. 2 and Wellhead Power Panoche peaking plants. A potential development project, 1,500 feet east of the project site is the Starwood Peaker plant. On November 17, 2006, an Application for Certification was filed with the California Energy Commission to construct and operate a 120 MW peaking power plant on a 5.6-acre property.

The CalPeak, Wellhead and Starwood peaking plants do not use cooling towers. Also the plants do not operate around the clock. The cumulative visual impact from publicly visible water vapor plumes introduced by the proposed peaking plants and generated by the operating peaking plants is considered to be low.

The addition of publicly visible structures by the proposed Starwood and Panoche electric generation projects would add to the existing congregation of industrial structures next to the Panoche Substation. The Panoche Substation would continue to be dominate in the landscape. A noticeable change would occur. The existing and planned projects are visually limited to an existing small industrial looking area surrounding the substation (an industrial island) in an expanse of agriculture. A visual change to the existing agricultural character and quality of the surrounding area is not expected to happen due to existing agricultural land use regulations.

While project-related nighttime light and daytime glare impacts on the project site would be mitigated to a level that would be less than significant, existing light and glare levels in the vicinity of the project would increase cumulatively as a result of the project and, existing and planned land uses. Light and glare impacts generated by these projects are not anticipated to be cumulatively considerable if mitigated according to CEQA, and the requirements of the Fresno County Government Code and the California Energy Commission.

The Federal Correctional Institution – Mendota, California is to be built southwest of the City of Mendota, approximately 15 miles from the PEC site. The Federal Bureau of Prisons is building a medium-security federal correctional institution to house approximately 1,152 adult male inmates, and a satellite prison camp to house 128 minimum-security inmates on a 960-acre property located near the corner of the intersection of California Avenue and State Route 33. The correctional facility would not be visible from the PEC site.

The proposed Starwood and Panoche projects would introduce to the KOP 1, KOP 2, and KOP 3 viewsheds publicly visible structures that are industrial in nature to an agricultural area. The view of the publicly visible structures would be compacted around the existing electric substation. The structures would be visually noticeable but would not be so great as to constitute a substantial degradation of the existing visual setting. Staff has determined that all significant direct impacts specific to visual resources resulting from the construction or operation of the project will be mitigated. The PEC in

combination with existing and planned projects would generate a less than significant cumulative visual effect to the KOP 1, KOP 2, and KOP 3 viewsheds.

Staff has reviewed Census 2000 information (maps) that shows a minority population greater than 50% within a six-mile radius of the proposed power plant, and a low income population less than 50% within the same radius (see the **SOCIOECONOMICS** section of this PSA, and **SOCIOECONOMICS Figure 1**).

SOCIOECONOMICS Figure 1 shows that an identified minority population may potentially have a limited exposure to the project's publicly visible structures. These structures would be surface treated to help soften their visual presence (see condition of certification **VIS-1**). In addition, the continued maintenance and operation of the orchard bordering the project site would limit ground level views of the project site. Staff has determined that all significant direct or cumulative impacts specific to visual resources resulting from the construction or operation of the project will be mitigated. Therefore, the proposed project would not introduce a significant visual resources related environmental justice issue(s).

COMPLIANCE WITH LORS

No adopted policies or ordinances pertaining to maintenance and protection of visual resources relevant to the proposed project at this location have been identified.

NOTEWORTHY PUBLIC BENEFITS

Noteworthy public visual benefits introduced to area by the proposed project have not been identified.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No agency or public comments have been received pertaining to visual resources.

CONCLUSIONS

The visual analysis focused on two main issues; (1) would construction and operation of the project cause visual impacts; and (2) would the project comply with applicable local LORS.

1. The proposed PEC is to be built in an area designated "Agriculture" by the Fresno County General Plan. Land uses surrounding the project site are visually described as industrial and agricultural/open space.

2. The power plant site does not use or have frontage on a segment of road recognized as a National Scenic Byway or All American Road, or designated as a State Scenic Highway.

3. The introduction of proposed PEC structures including its associated linear facilities would generate a less than significant visual effect at the three selected Key Observation Points.

4. The introduction of the proposed PEC including its associated linear facilities would generate a less than significant new source of light or glare to nighttime or daytime views.

5. Publicly visible water vapor plumes generated by the PEC's cooling towers and combustion turbine exhaust stacks based on the information provided by the applicant for the project would cause a less than significant visual impact.

6. The cumulative visual impact of publicly visible water vapor plumes emitted by the PEC, and other existing and planned electric generation facilities on neighboring properties would be less than significant. Except for the project, existing and planned electric generation facilities do not involve the use of cooling towers. In addition, under normal weather conditions no visible water vapor plumes would form from the power plant exhaust stacks due to the very high exhaust temperature from their turbines.

7. The proposed project's publicly visible project structures and water vapor plumes may potentially be seen by an identified minority population of greater than 50%. Staff has determined that all significant direct or cumulative impacts specific to visual resources resulting from the operation of the project will be mitigated. Therefore, the proposed project does not introduce a significant visual resource related environmental justice issue(s).

8. With mitigation, the construction and operation of the PEC would not cause any significant visual impacts to adjacent land uses, or contribute considerably to a cumulative visual impact.

The construction and operation of the PEC project as proposed, with the effective implementation of the applicant's proposed design measure and staff's recommended conditions of certification (below) would ensure that visual impacts generated by the project are less than significant, and ensure that the project complies with all applicable LORS regarding visual resources.

PROPOSED CONDITIONS OF CERTIFCATION

Surface Treatment of Project Structures and Buildings

VIS-1 The project owner shall color and finish the surfaces of all project structures and buildings visible to the public to ensure that they: (1) minimize visual intrusion and contrast by blending with the landscape; (2) minimize glare; and (3) comply with local design policies and ordinances. The transmission line conductors shall be non-specular and non-reflective, and the insulators shall be non-reflective and non-refractive.

The project owner shall submit a surface treatment plan to the Compliance Project Manager (CPM) for review and approval. The treatment plan shall include:

A. A description of the overall rationale for the proposed surface treatment, including the selection of the proposed color(s) and finishes;

B. A list of each major project structure, building, tank, pipe, and wall; transmission line towers and/or poles; and fencing, specifying the color(s) and finish proposed for each. Colors must be identified by vendor, name, and number; or according to a universal designation system;

C. One set of color brochures or color chips showing each proposed color and finish;

D. One set of 11" x 17" color photo simulations at life size scale of the proposed treatment for project structures, including structures treated during manufacture, from the Key Observation Points;

E. A specific schedule for completing the treatment; and

F. A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not request vendor treatment of any buildings or structures during their manufacture, or perform final field treatment on any buildings or structures, until the project owner has received treatment plan approval by the CPM.

Verification: At least 90 days prior to specifying vendor color(s) and finish (es) for structures or buildings to be surface treated during manufacture, the project owner shall submit the proposed treatment plan to the CPM for review and approval and simultaneously to the County of Fresno Department of Public Works and Planning, Development Services Division for review and comment. The project owner shall provide the CPM with the County's comments at least 30 days prior to the estimated date of providing paint specification to vendors.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a plan with the specified revision(s) for review and approval by the CPM before any treatment is applied. Any modifications to the treatment plan must be submitted to the CPM for review and approval.

Within ninety (90) days after the start of commercial operation, the project owner shall notify the CPM that surface treatment of all listed structures and buildings has been completed and is ready for inspection; and shall submit one set of electronic color photographs from the Key Observation Points.

The project owner shall provide a status report regarding surface treatment maintenance in the Annual Compliance Report. The report shall specify a): the condition of the surfaces of all structures and buildings at the end of the reporting year; b)

maintenance activities that occurred during the reporting year; and c) the schedule of maintenance activities for the next year.

Construction Lighting

VIS-2 The project owner shall ensure that lighting for construction of the power plant is used in a manner that minimizes potential night lighting impacts, as follows:

A. All lighting shall be of minimum necessary brightness consistent with worker safety and security;

B. All fixed position lighting shall be shielded/hooded, and directed downward and toward the area to be illuminated to prevent direct illumination of the night sky and obtrusive spill light beyond the boundaries of the power plant site or the site of construction of ancillary facilities, including any security related boundaries;

C. Wherever feasible and safe and not needed for security, lighting shall be kept off when not in use; and

D. Complaints concerning adverse lighting impacts will be promptly addressed and mitigated.

Verification: Within seven days after the first use of construction lighting, the project owner shall notify the CPM that the lighting is ready for inspection. If the CPM requires modifications to the lighting, the project owner shall implement the necessary modifications within 15 days of the CPM's request and notify the CPM that the modifications have been completed.

Within 10 days of receiving a lighting complaint, the project owner shall provide the CPM with a complaint resolution form report as specified in the compliance General Conditions including a proposal to resolve the complaint, and a schedule for implementation. The project owner shall notify the CPM within 10 days after completing implementation of the proposal. A copy of the complaint resolution form report shall be included in the subsequent Monthly Compliance Report following complaint resolution.

Permanent Exterior Lighting

VIS-3 To the extent feasible, consistent with safety and security considerations and commercial availability, the project owner shall design and install all permanent exterior lighting such that a) light fixtures do not cause obtrusive spill light beyond the project site; b) lighting does not cause excessive reflected glare; c) direct lighting does not illuminate the nighttime sky; d) illumination of the project and its immediate vicinity is minimized, and e) lighting complies with local policies and ordinances.

The project owner shall submit to the CPM for review and approval and simultaneously to the County of Fresno Department of Public Works and Planning, Development Services Division for review and comment a lighting mitigation plan that includes the following:

A. A process for addressing and mitigating complaints received about potential lighting impacts;

B. Lighting shall incorporate commercially available fixture hoods/shielding, with light directed downward or toward the area to be illuminated;

C. Light fixtures shall not cause obtrusive spill light beyond the project boundary;

D. All lighting shall be of minimum necessary brightness consistent with operational safety and security; and

E. Lights in high illumination areas not occupied on a continuous basis (such as maintenance platforms) shall have (in addition to hoods) switches, timer switches, or motion detectors so that the lights operate only when the area is occupied.

Verification: At least 90 days prior to ordering any permanent exterior lighting, the project owner shall contact the CPM to determine the required documentation for the lighting mitigation plan.

At least 60 days prior to ordering any permanent exterior lighting, the project owner shall submit to the CPM for review and approval and simultaneously to the County of Fresno Department of Public Works and Planning, Development Services Division for review and comment a lighting mitigation plan. The project owner shall provide the County's comments to the CPM at least 10 days prior to the date lighting materials are ordered.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a revised plan for review and approval by the CPM.

The project owner shall not order any exterior lighting until receiving CPM approval of the lighting mitigation plan

Prior to commercial operation, the project owner shall notify the CPM that the lighting has been installed and is ready for inspection. If after inspection the CPM notifies the project owner that modifications to the lighting are needed, within 30 days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed and are ready for inspection.

Within 10 days of receiving a lighting complaint, the project owner shall provide the CPM with a complaint resolution form report as specified in the Compliance General Conditions including a proposal to resolve the complaint, and a schedule for implementation. A copy of the complaint resolution form report shall be submitted to the CPM within 30 days of complaint resolution.

Plume Formation

VIS-4 The project owner shall ensure that the cooling tower is designed and operated as presented to the Energy Commission during the licensing of the PEC project.

The cooling tower shall be designed and operated so that that the exhaust air flow rate per heat rejection rate (1) will not be less than 11.1 kilograms per second per megawatt when the ambient conditions are 16.8 degrees F and 60% relative humidity, (2) will not be less than 14.6 kilograms per second per megawatt when the ambient conditions are 63.3 degrees F and 60% relative humidity, and (3) will not be less than 12.5 kilograms per second per megawatt when the ambient conditions are 114 degrees F and 60% relative humidity. The project owner shall provide a cooling tower fogging frequency curve from the cooling tower manufacturer for this project's final cooling tower design.

Verification: At least 90 days prior to ordering the cooling towers, the project owner shall provide to the CPM for review the final design specifications of the cooling tower to confirm that design mass flow rates for the cooling tower cells meet these requirements. The project owner shall not order the cooling tower until notified by the CPM that this design requirement has been satisfied.

The project owner shall provide written documentation in each Annual Compliance Report to demonstrate that the cooling towers have consistently been operated within the above-specified design parameters, except as necessary to prevent damage to the cooling tower. If determined to be necessary to ensure operational compliance, based on legitimate complaints received or other physical evidence of potential non-compliant operation, the project owner shall monitor the cooling tower operating parameters in a manner and for a period as specified by the CPM. For each period that the cooling tower operation monitoring is required, the project owner shall provide to the CPM the cooling tower operating data within 30 days of the end of the monitoring period. The project owner shall include with this operating data an analysis of compliance and shall provide proposed remedial actions if compliance cannot be demonstrated.

The CPM will determine potential non-compliant operation through a comparison of the ambient conditions during the period(s) of complaint and the expected plume occurrence based on the manufacturer's plume fogging frequency curve, which will be provided by the project owner as a requirement of this condition. Additionally, if photographic evidence of extremely large plumes (plume length or height greater than 1,000 feet) is provided for ambient conditions that are close to the fogging/no fogging line of the fogging frequency curve, potential non-compliant operation can be determined by comparing the actual plume dimensions with dispersion modeling analysis predicted worst-case plume dimensions for the ambient conditions occurring during the period(s) of compliant operation.

REFERENCES

California Department of Transportation. The California Scenic Highway System Mapping System, http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm

County of Fresno. Fresno County General Plan Open Space and Conservation Element, October 2000.

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EPA 1990. Environmental Protection Agency. Emission Measurement Technical Information Center NSP Test Method, Method 9-Visual Determination of the Opacity of Emissions fro Stationary Sources. October 25, 1990.

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Smardon, Richard C., James E. Palmer, and John P. Felleman. 1986. *Foundations for* Visual *Project Analysis.* John Wiley & Sons. New York.

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APPENDIX VR-1

STAFF'S VISUAL RESOURCES EVALUATION METHODOLOGY

Visual resources analysis has an inherent subjective aspect. Use of generally accepted criteria for determining environmental impact significance and a clearly described analytical approach aid in developing an analysis that can be readily understood.

Staff's methodology is based on the California Environmental Quality Act (CEQA) Guidelines. The methodology includes an evaluation of the visual characteristics of the existing setting, the visual characteristics of the proposed project, the circumstances affecting the viewer, and the degree of visual impact that the proposed project would cause.

ELEMENTS OF THE METHODOLOGY

Key Observation Points

Staff evaluates the existing visible physical environmental setting from a fixed vantage point (called a "Key Observation Point" [KOP]), and the visual change introduced by the proposed project to the view from that KOP. The view as seen from the KOP is referred to as the viewshed. Staff uses a KOP[2] to represent a location(s) from which to conduct detailed analyses of the proposed project and to obtain existing condition photographs and prepare visual simulations. KOPs are selected to be representative of the most critical viewshed locations from which the project would be seen. Because it is not feasible to analyze all the views in which a proposed project would be seen, it is necessary to select a KOP that would most clearly display the visual effects of the proposed project. A KOP may also represent a primary viewer groups that would potentially be affected by the project. In addition to KOP photo(s), staff reviews landscape character photos that help provide a visual overview of a project site, its vicinity, and the selected KOP area, as appropriate. Prior to application submittal, staff participates in the selection of appropriate KOP(s) for the analysis.

Staff also reviews federal, state, and local LORS and their policies or guidelines for the protection or preservation of visual resources that may be applicable to the project site and surrounding area; such as local government land-use planning documents (e.g., General Plan, zoning ordinance).

LORS Consistency

Energy Commission staff consider federal, state, and local laws, ordinances, regulations, and standards (LORS) relevant to visual resources. Conflicts with such LORS can constitute significant visual impacts. For example visual staff examines land use planning documents, such as local government General Plans and Specific Plans,

[2]The use of KOPs or similar view locations is common in visual resource analysis. The U.S. Bureau of Land Management (USDI BLM 1986a, 1986b, 1984) and the U.S. Forest Service (USDA Forest Service 1995) use such an approach.

and zoning ordinances applicable to the project site and surrounding area to gain insight as to the type of land uses intended for the area, and the guidelines given for the protection or preservation of visual resources.

Visible Water Vapor Plume Frequency

When a proposed power plant is operated at times of low temperature and high humidity, the potential exists for the exhaust from its cooling towers to condense and form visible water vapor plumes (steam plume). The formed plume potentially could have an adverse effect on visual resources in the vicinity of the project.

The severity of the visual impacts created by a project's visible plumes depends on five factors: 1) the frequency of the plumes, 2) the physical size of the plumes (dimensions), 3) the sensitivity of the viewers who would see the plumes, 4) the distance between the plumes and the viewers, 5) the visual quality of the existing viewshed; and, 6) whether a scenic resource or vista would be blocked by the plumes.

Staff completes water vapor plume modeling of the proposed project's cooling towers using design parameters provided by the applicant. Staff models the estimated plume frequency and dimensions for the cooling tower and turbine exhaust using the Combustion Stack Visible Plume (CSVP) model, and a multi-year meteorological data set obtained for the area where the project is proposed.

Staff considers the 20th percentile plume to be the reasonable worst case plume dimensions on which to base its visual impact analysis. The 20th percentile plume is the smallest of the plumes that are predicted to occur zero to 20% of the time. Eighty (80) percent of the time the dimensions of the clear hour plumes would be smaller than the 20th percentile plume dimensions. A one percentile clear hour plume would be extremely large, very noticeable to a wide area, but would occur very infrequently.

Staff focuses its frequency of the plumes analysis on the portion of the year when the ambient conditions (i.e., cool/cold temperatures and high relative humidity) are such that plumes are most likely to occur (typically from November through April) and when "clear" sky conditions exist because this is when the plumes would cause the most visual contrast with the sky and have the greatest potential to cause adverse visual impacts. Staff eliminates from consideration plumes that occur at night or during rain or fog conditions because plume visibility, and overall visual quality, is typically low during those conditions. In addition, plumes that occur during specific cloudy conditions are also eliminated because under these conditions, plumes have less contrast with the background sky. A plume frequency of 20% of seasonal daylight no rain/fog high visual contrast (i.e. "clear") hours is used to determine potential plume impact significance. If it is determined that the seasonal daylight clear hour plume frequency is greater than 20%, then plume dimensions are determined and a significance analysis is included in the Visual Resources section of the Staff Assessment for the proposed project.

Plume frequencies of less than 20% have been determined to generally have a less than significant impact. If the modeling predicts seasonal daylight clear plume frequencies greater than 20%, staff calculates the dimensions of the clear hour plumes and then conduct an assessment of the visual change (in terms of contrast, dominance and view blockage) that would be caused by the 20th percentile plume dimensions. Staff

also analyzes the predicted plume's potential luminescence (light refraction resulting in a glare or glow) and color contrast, and opacity (the degree to which light is prevented from passing through an emission plume) that may be introduced to the KOP viewsheds. Considering the visual sensitivity of the existing landscape and viewing characteristics, the degree of visual change caused by the plumes may result in a significant visual impact.

Energy Commission staff model the estimated turbine plume frequency and dimensions for the cooling tower and turbine exhaust using the Combustion Stack Visible Plume (CSVP) model, and a multi-year meteorological data set obtained for the area where the project is proposed.

A plume frequency threshold of 20% of seasonal (typically from November through April) daylight no rain/fog high visual contrast (i.e. "clear") hours is used to assess potential plume impact significance. If it is determined that the seasonal daylight clear hour plume frequency is greater than 20%, then plume dimensions are determined and a significance analysis is included in the Visual Resources section of the Staff Assessment for the proposed project. Plume frequencies of less than 20% have been determined to generally have a less than significant impact.

California Environmental Quality Act Guidelines

The CEQA Guidelines define a "significant effect on the environment" to mean a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including . . . objects of historic or aesthetic significance" (California Code of Regulations, Title 14, Section 15382).

Appendix G Environmental Checklist Form of the CEQA Guidelines, under Aesthetics, lists the following four questions to be addressed regarding whether the potential impacts of a project are significant:

1. Would the project have a substantial adverse effect on a scenic vista?

2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

4. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Staff answers each of the four checklist questions for the proposed project, including any related facility such as a transmission line or gas pipeline; and for both construction and operation phases.

Visual resources analysis has an inherent subjective aspect. Use of generally accepted criteria for determining environmental impact significance and a clearly described analytical approach aid in developing an analysis that can be readily understood.

Staff's methodology is based on the California Environmental Quality Act (CEQA) Guidelines. The methodology includes an evaluation of the visual characteristics of the existing setting, the visual characteristics of the proposed project, the circumstances affecting the viewer, and the degree of visual impact that the proposed project would cause.

APPENDIX VR-2

VISIBLE PLUME MODELING ANALYSIS

William Walters

INTRODUCTION

The following provides the assessment of the Panoche Energy Center (Panoche or PEC) project cooling tower and gas turbine exhaust stack visible plumes. Staff completed a modeling analysis for the applicant's proposed unabated cooling tower and turbine design based on data provided by the applicant.

PROJECT DESCRIPTION

The proposed project will utilize four General Electric LMS100 gas turbines which will be operated in simple-cycle mode. The applicant has also proposed a five-cell mechanical-draft cooling tower. Because of the intercooler characteristic of the LMS100 type gas combustion turbine, the gas turbine cooling load is significantly larger than the gas turbine cooling load for other simple-cycle gas turbines. The intercooler removes heat from the gas turbine inlet air after it has been compressed in the gas turbine compressor's low pressure section and before it is fed into the gas turbine compressor's high pressure section. The intercooler closed-loop cooling water in turn is cooled by the cooling tower's recirculating water flow in a non-contact heat exchanger. The applicant has not proposed to use any methods to abate visible plumes from the cooling towers.

VISIBLE PLUME MODELING METHODS

PLUME FREQUENCY AND DIMENSION MODELING

The Combustion Stack Visible Plume (CSVP) model was used to estimate plume frequency and plume dimensions for the cooling tower exhaust. This model provides conservative estimates of both plume frequency and plume size. This model uses hourly cooling tower exhaust parameters and hourly ambient condition data to determine the plume frequency. This model is based on the algorithms of the Industrial Source Complex model (Version 2), that determine temperatures at the plume centerline, but this model does not incorporate building downwash.

The modeling method combines the cooling tower cell exhausts into an equivalent single stack. This method may overestimate cooling tower plume size (particularly height) during plume hours with higher winds due to little cell interaction and the potential for building downwash, but will be more accurate during low wind and calm periods when the exhausts from the cooling tower cells will combine into one coherent body. Wind speeds are set to 1 m/s during calm hours and a rural land classification was used in the modeling analysis.

CLOUD COVER DATA ANALYSIS METHOD

A plume frequency of 20% of seasonal (November through April) daylight no rain/fog high visual contrast (i.e. “clear”) hours is used to determine potential plume impact significance. The methodology used to determine high visual contrast hours is provided below:

> The Energy Commission has identified a “clear” sky category during which plumes have the greatest potential to cause adverse visual impacts. For this project the meteorological data set[3] used in the analysis categorizes total sky cover as “clear”, “scattered”, “broken”, “overcast”, “partially obscured”, and obscured”. For the purpose of estimating the high visual contrast hours staff has included in the “Clear” category a) all hours with total sky cover defined as “clear” plus b) half of the non-obscured hours with unlimited ceiling height (i.e. hours with a sky opacity equal to or less than 50%). The rationale for including these two components in this category is as follows: a) plumes typically contrast most with sky under clear conditions and b) for a substantial portion of the time when total sky cover is not clear or obscured the opacity of the sky cover is relatively low (equal to or less than 50%), and these clouds do not substantially reduce contrast with plumes. Staff has estimated that approximately half of the hours with sky opacity of less than 50% can be considered high visual contrast hours and are included in the “clear” sky definition.

If it is determined that the seasonal daylight clear hour plume frequency is greater than 20% then plume dimensions are calculated, and a significance analysis of the plumes is included in the Visual Resources section of the Staff Assessment.

COOLING TOWER VISIBLE PLUME MODELING ANALYSIS

COOLING TOWER DESIGN AND OPERATING PARAMETERS

The following cooling tower design characteristics, presented below in **VISIBLE PLUME Table 1**, were determined through a review of the applicant’s AFC (PEC 2006a) and data responses (PEC 2007a, Data Response #52). The data presented in **VISIBLE PLUME Table 1** was used to model the cooling tower plume frequency and dimensions.

[3] This analysis uses a five year Lemoore Naval Air Station meteorological data set (1992 through 1995 and 1997) that was obtained from the National Climatic Data Center (NCDC).

VISIBLE PLUME Table 1
Cooling Tower Operating and Exhaust Parameters

Parameter		Cooling Tower Design Parameters		
Number of Cells per Tower		5 Cells (only 2 to 4 cells operate at any given time)		
Cell Height		42 feet (12.8 meters)		
Cell Stack Diameter		22 feet (6.71 meters)		
Tower Housing Length		180 feet (54.86 meters)		
Tower Housing Width		42 feet (12.8 meters)		
Case	**Inlet Air Ambient Condition**	**Heat Rejection Rate (MW)**	**Exhaust Flow Rate (lbs/hr)**	**Exhaust Temperature (°F)**
1 (2 cells)	16.8°F, 84% RH	91.7	8,100,000	82
2 (4 cells)	63.3°F, 62% RH	114.9	13,300,000	90
3 (4 cells)	114°F, 14.6% RH	129.2	12,800,000	103

Source: PEC 2007a, Data Response #52, with tower housing length corrected.

The applicant indicated that the number of cooling tower cells in operation is expected to be 4 cells when operating with ambient conditions above 50°F, three cells when operating between 30°F and 50°F, and two cells when operating below 30°F. Additionally, the applicant provided expected per turbine heat rejection (HR) formulae as follows:

Below 60°F – HR (MMBtu/hr) = 70.3 + 0.48*Ambient Temperature
60°F and above – HR (MMBtu/hr) = 82.8 + 0.24*Ambient Temperature

All of this information supplied by the applicant was used to interpolate the operating conditions for the cooling tower exhaust to the different modeled ambient conditions.

The cooling tower design for this project, and a few other recent projects with GE LMS100 gas turbines, is different than the dozens of cooling towers evaluated for siting cases from 2001 to present. Specifically, this cooling tower employs a much higher "range", which is the difference in the temperature of the incoming and returning water flows into and out of the cooling tower, and also employs a low air flow to heat rejection ratio (i.e. the amount of air flow through the cooling per quantity of heat rejected from the cooling tower). The range for this cooling is designed to be approximately 35°F, while the range for combined cycle cooling tower is more typically designed to be about 17°F. The hotter incoming water allows the cooling tower to be designed smaller and use less air, but this increases the amount of heat and water emitted per unit air volume and that causes an increase in the plume formation potential from the cooling tower.

COOLING TOWER VISIBLE PLUME MODELING RESULTS

VISIBLE PLUME Table 2 provides the CSVP model visible plume frequency results for year round full load operation using a five-year (1992-1995, 1997) Lemoore Naval Air Station meteorological data set, obtained from the NCDC.

VISIBLE PLUME Table 2
Predicted Hours with Cooling Tower Visible Plumes
Year Round Full Load Operation
Lemoore NAS 1992-1995, 1997 Meteorological Data

Case	Available (hr)	Plume (hr)	Percent
All Hours	43,824	24,907	56.83%
Daylight Hours	22,177	8,753	39.47%
Daylight No Rain No Fog	19,384	6,094	31.44%
Seasonal Daylight No Rain No Fog*	7,371	4,301	58.35%
Seasonal Daylight Clear Hours	2,492	1,276	51.20%

*Seasonal conditions occur anytime from November through April.

The results noted above assume full time operation; however, the facility has requested specific maximum quarterly operating limits. These limits are based on hours of operation per quarter as follows:

1st Quarter – 1,100 Hours
2nd Quarter – 1,100 Hours
3rd Quarter – 1,600 Hours
4th Quarter – 1,200 Hours

Considering the requested quarterly operating limits and normal daily power demand curves staff has determined a 12-hour operating schedule from 9 am to 9 pm to represent a worst-case operating condition. With this worst-case operating schedule the predicted worst-case seasonal daylight clear hour plume frequency is reduced to 30.1%. Since the plume frequencies remain over 20% of the seasonal daylight clear hours the corresponding plume dimensions were estimated. The plume dimensions are estimated by the CSVP model and presented in VISIBLE PLUME Table 3.

VISIBLE PLUME Table 3
Predicted Cooling Tower Visible Plume Dimensions

Cooling Tower Seasonal "Clear" Hours 9 am to 9 pm Daily Operation Plume Dimensions in Meters (feet)			
Percentile	**Length**	**Height**	**Width**
1%	206 (676)	291 (954)	44 (145)
5%	95 (310)	126 (413)	30 (98)
10%	46 (152)	74 (242)	24 (78)
20%	**22 (72)**	**33 (109)**	**19 (63)**
30%	2 (7)	15 (49)	10 (33)

Results include the cooling tower stack height of 12.8 meters (42 feet), see VISIBLE PLUME Table 1.

TURBINE EXHAUST VISIBLE PLUME ASSESSMENT

The temperature of the gas turbine exhaust exceeds 740°F under normal operating conditions. From staff's experience gas turbines with exhaust temperatures of this magnitude would not form visible steam plumes under any meteorological conditions that might exist at the project site. Therefore, staff did not analyze the gas turbine exhaust stack further for potential visible plumes.

CONCLUSIONS

Visible water vapor plumes from the proposed Panoche cooling tower could occur more than 20% of seasonal daylight clear hours depending on facility operation. Therefore, further visual impact analysis of worst-case plume frequencies and plume sizes has been completed.

Visible water vapor plumes are not expected to form at the proposed Panoche gas turbine exhaust stacks under any meteorological conditions that might exist at the project site.

REFERENCES

PEC (Panoche Energy Center Project) 2006a – Application for Certification. Submitted to the California Energy Commission on August 2, 2006.

PEC (Panoche Energy Center Project) 2007a – Data Responses Set 1A. Submitted to the California Energy Commission on January 9, 2007.

VISUAL RESOURCES - FIGURE 1

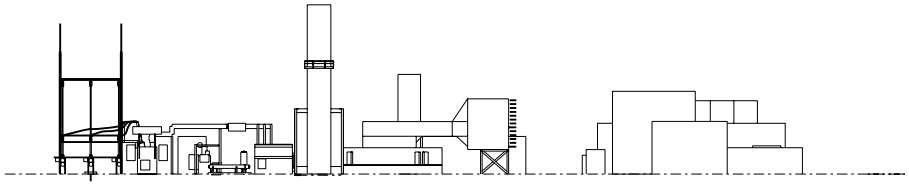
Panoche Energy Center Project - Aerial View Of Site And Vicinity

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

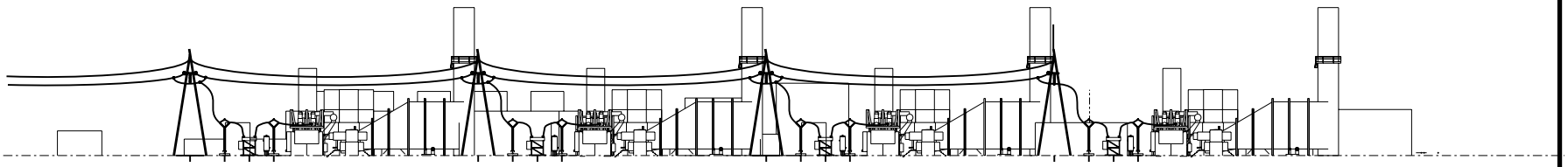
SOURCE: Google Earth

VISUAL RESOURCES - FIGURE 2

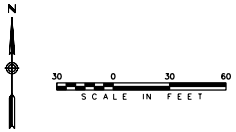
Panoche Energy Center Project - Plant Elevation Looking East and South



ELEVATION LOOKING EAST



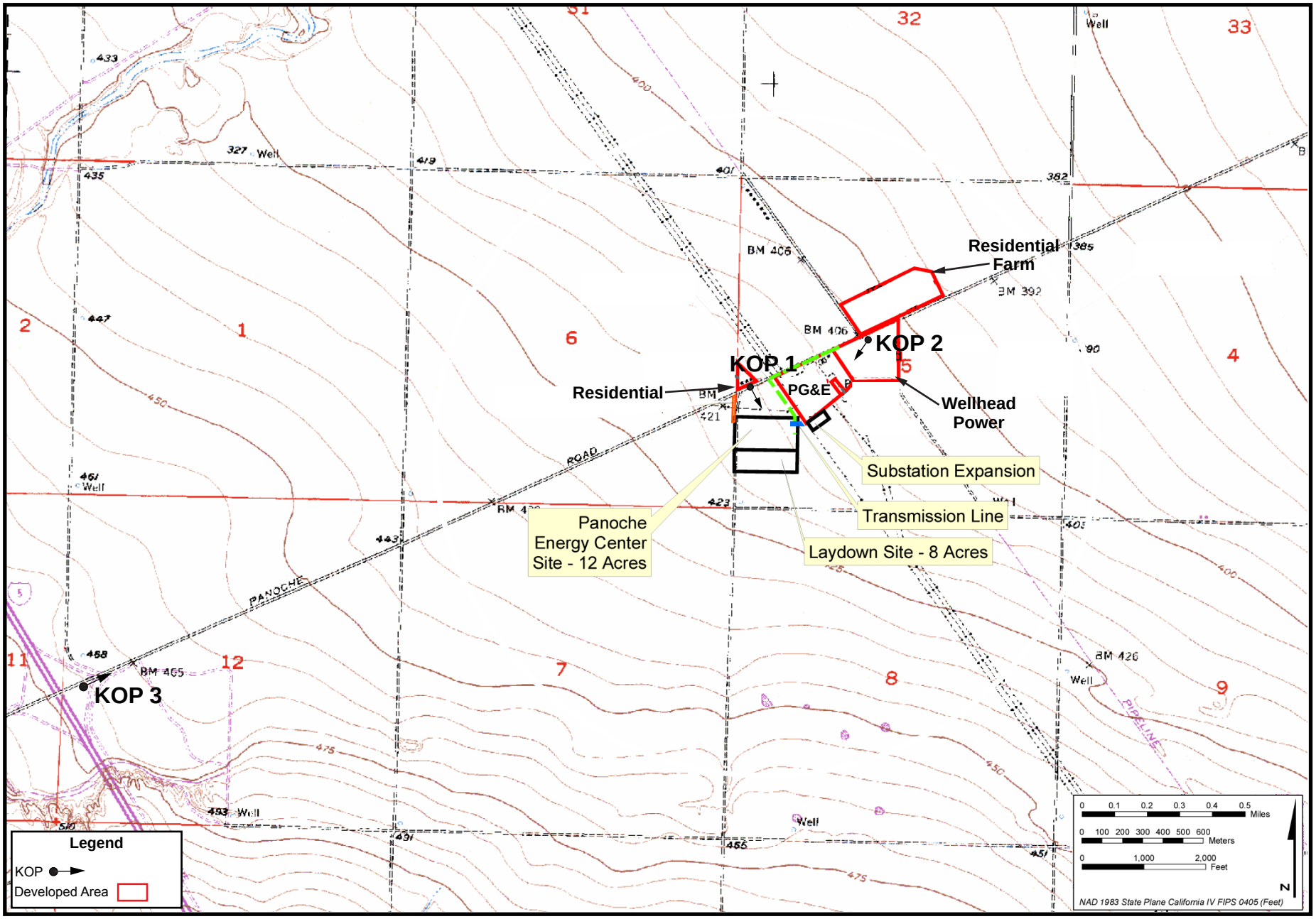
ELEVATION LOOKING SOUTH



SOURCE: AFC Figure 3.4-2

VISUAL RESOURCES - FIGURE 3

Panoche Energy Center Project - KOP Locations and Existing Land Use Surrounding Project Site



CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: AFC Figure 5.4-2

VISUAL RESOURCES - FIGURE 4 - KOP 1

Panoche Energy Center Project - Existing Front Yard View From One Of Three Residences On West Panoche Road, Across The Street From The Proposed Project Site

SOURCE: AFC Figure 5.13-13

VISUAL RESOURCES - FIGURE 5

Panoche Energy Center Project - Landscape Character Photo Of Substation East Of Project Site

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Starwood AFC Figure 5.13-14

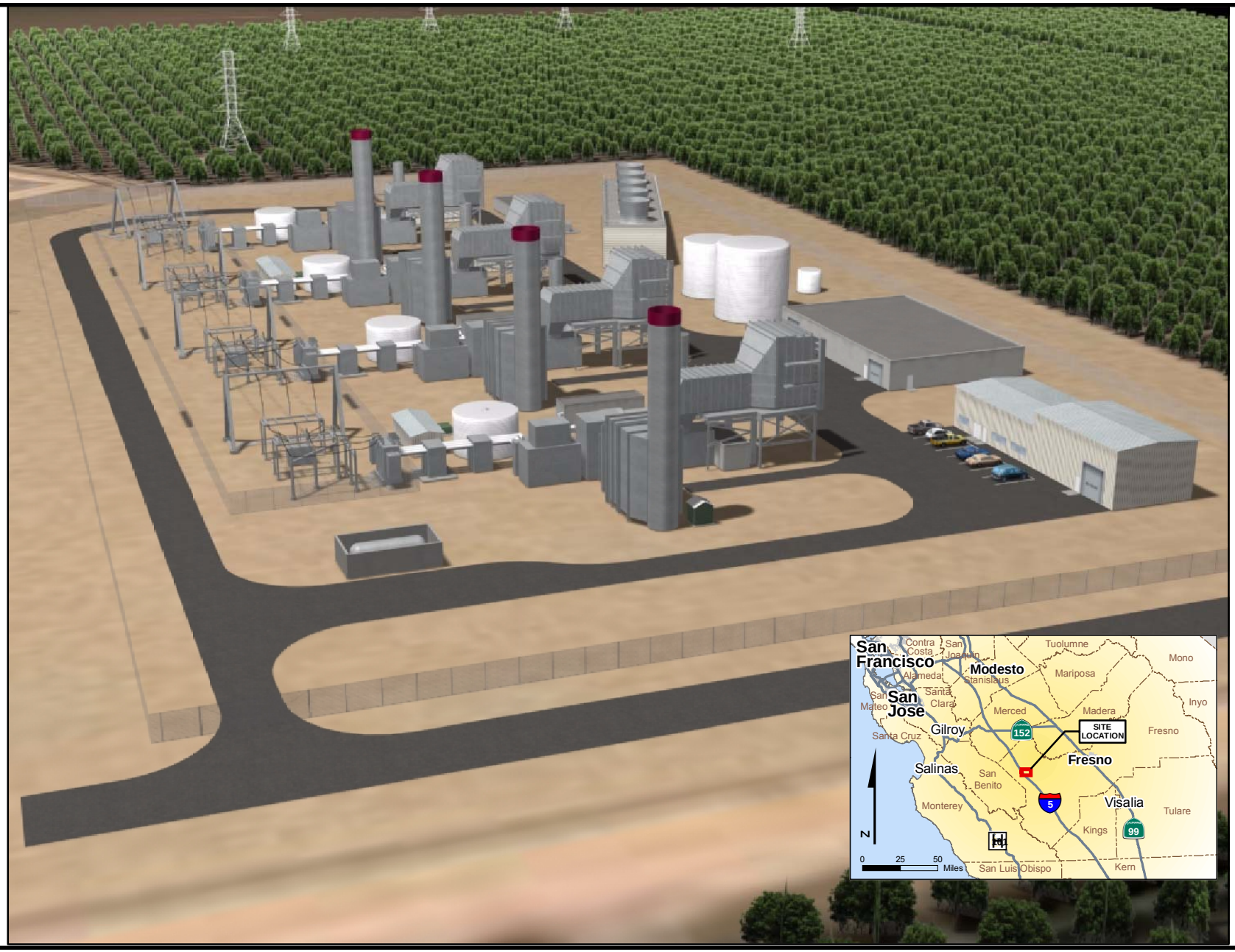
VISUAL RESOURCES - FIGURE 6 - KOP 1

Panoche Energy Center Project - Photo Simulation Of Front Yard View Taken From One Of Three Residences On West Panoche Road, Across The Street From The Proposed Project Site

SOURCE: AFC Figure 5.13-13

VISUAL RESOURCES - FIGURE 7

Panoche Energy Center Project - Appearance Of Project Site After Completion



CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: AFC Figure 5.13-2

VISUAL RESOURCES - FIGURE 8 - KOP 2

Panoche Energy Center Project - Existing Backyard View From One Of Five Residences On West Panoche Road

SOURCE: AFC Figure 5.13-14

VISUAL RESOURCES - FIGURE 9

Panoche Energy Center Project - Landscape Character Photo Of The Existing Backyard View

SOURCE: Starwood AFC Figure 5.13-13

VISUAL RESOURCES - FIGURE 10 - KOP 2

Panoche Energy Center Project - Photo Simulation Of Backyard View From One Of Five Residences On West Panoche Road

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: AFC Figure 5.13-14

VISUAL RESOURCES - FIGURE 11

Panoche Energy Center Project - Existing Motorist View From The Overpass Of Interstate 5 And West Panoche Road

SOURCE: AFC Figure 5.13-15

VISUAL RESOURCES - FIGURE 12

Panoche Energy Center Project - Landscape Character Photo Of Proposed Project Site From Southbound Interstate 5 - 2 Miles West Of Project Site

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Starwood AFC Figure 5.13-9

VISUAL RESOURCES - FIGURE 13

Panoche Energy Center Project - Photo Simulated View From The Overpass Of Interstate 5 And West Panoche Road

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: AFC Figure 5.13-15

WASTE MANAGEMENT

Ellie Townsend-Hough

SUMMARY OF CONCLUSIONS

Management of the waste generated during construction and operation of the Panoche Energy Center (PEC) or those associated with remediation of existing on-site contamination, if any, would not result in any significant adverse impacts if the measures and remediation proposed in the Application for Certification (AFC) and staff's proposed conditions of certification are implemented.

INTRODUCTION

This Preliminary Staff Assessment (PSA) presents an analysis of issues associated with managing wastes generated from constructing and operating the proposed PEC and any toxic hazardous waste contaminants already existing on-site because of past activities. Staff has evaluated the proposed waste management plans and mitigation measures designed to reduce the risks and environmental impacts associated with handling, storing, and disposing of project-related hazardous and nonhazardous wastes. Staff also evaluated the potential for site remediation if needed. The technical scope of this analysis encompasses solid wastes existing on-site and those generated during facility construction and operation. Wastewater is more fully 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 would be in compliance with all applicable laws, ordinances, regulations, and standards (LORS). Compliance with LORS ensures that wastes generated during the construction and operation of the proposed project would be managed in an environmentally safe manner.
- The disposal of project wastes would not result in significant adverse impacts to existing waste disposal facilities.
- Upon project completion, the site is managed such that contaminants would not pose a significant risk to humans or the environment.
- Refer to waste management issues covered in **Worker Safety** section and **Hazardous Materials Management** section, if appropriate.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following framework of federal, state, and local environmental laws, ordinances, regulations and standards (LORS) exists to ensure the safe and proper management of hazardous waste from generation to disposal to reduce the risks of accidents that might impact worker and public health and the environment. Their provisions have established the basis for staff's determination regarding the significance and acceptability of the PEC with respect to management of waste.

WASTE MANAGEMENT Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
42 U.S.C. § 6922 Resource Conservation and Recovery Act	The Resource Conservation and Recovery Act (RCRA) establishes requirements for the management of hazardous wastes from the time of generation to the point of ultimate treatment or disposal. Section 6922 requires generators of hazardous waste to comply with requirements regarding: • Record keeping practices which identify quantities of hazardous wastes generated and their disposition, • Labeling practices and use of appropriate containers, • Use of a manifest system for transportation, and • Submission of periodic reports to the U.S. Environmental Protection Agency (EPA) or authorized state agency.
RCRA Subtitle C	Controls storage, treatment, and disposal of hazardous waste.
RCRA Subtitle D	Regulates design and operation of solid waste landfills.
RCRA 3008(h)	The corrective action program designed to ensure the remediation of hazardous releases and contamination associated with RCRA-regulated facilities.
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 (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 and are enforced by the Cal/EPA Department of Toxic Substances Control.
Title 22, California Code of Regulations, §67100.1 et seq.	Hazardous Waste Source Reduction and Management Review. These sections establish reporting requirements for generators of certain hazardous and extremely hazardous wastes in excess of specified limits. The required reports must indicate the generator's waste management plans and performance over the reporting period.
Local	
Fresno County Department of Community Health (FCDCH), Environmental Health Division	Regulates enforcement responsibility for the implementation of Title 23, Division 3, Chapters 16 and 18 of the CCR, as it relates to hazardous material storage and petroleum UST cleanup.
FCDCH, Environmental Health Division	Regulates hazardous waste generator permitting, and hazardous waste handling and storage.
Fresno County General Plan Public Facilities Element	Will ensure all new development complies with applicable provisions of County Integrated Solid Waste Management Plan.

SETTING

The proposed PEC property consists of approximately 20 acres of land located on West Panoche Road near the City of Mendota, Fresno County, California. The property is currently occupied by a pomegranate orchard.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Two issues are addressed in this Waste Management section: 1) potential existing site contamination, and 2) the methods used to handle wastes (Class I hazardous wastes, Class II designated wastes, and Class III municipal solid wastes) during construction and operations. The methods staff uses and the thresholds for determining significance of impacts are different for these two issues.

For any site proposed for the construction of a power plant in California, the applicant must provide sufficient documentation about the nature of any existing contamination on the site. Staff requires that at the least, a Phase I Environmental Site Assessment (ESA) be prepared and submitted to the Energy Commission for staff's review and evaluation.

A Phase I ESA provides a history of use of the site, often as far back as the mid-1800s, and a list of any hazardous waste release within a certain distance of the site. If there were a reasonable potential that the site contains hazardous waste, soil or groundwater would be sampled and analyzed as part of a Phase II ESA. The Phase II ESA verifies the level of contamination and the potential for remediation.

Staff may utilize either of two approaches or both for determining if hazardous waste present on the site would pose a risk to on-site workers (construction or operations) or the public. The first approach follows standards promulgated by Cal/EPA, principally by the Department of Toxic Substances Control (DTSC), the Office of Environmental Health Hazard Assessment (OEHHA), and the Regional Water Quality Control Boards (RWQCB). Staff would compare the levels of contaminants found on-site with established standards, such as OEHHA California Human Health Screening Levels (CHHSLs). If metals were suspected of being present at unsafe levels, staff would compare those levels to levels that occur naturally in soil or water as tabulated by DTSC or other federal agencies.

The second approach involves the preparation of a site-specific Human Health Risk Assessment and/or Ecological Risk Assessment. The human health risk assessment would follow Cal/EPA guidelines and must address all affected populations including the most burdened and compromised receptors. Staff would require the applicant to prepare such an assessment and would require some form of remediation if the human health cancer risk exceeded one-in-one million or the non-cancer hazard index exceeded 1.0, per 42 U.S.C. Section 6922 (Resource Conservation and Recovery Act), and per the California Health and Safety Code Section 25100 et seq. (Hazardous Waste Control Act of 1972, as amended). An ecological risk screening evaluation or risk assessment would be required if contaminants might pose a risk to biological receptors. The applicant also would follow Cal/EPA and Regional Water Quality Control Board (RWQCB) guidelines and if the ecological risks were significant, appropriate mitigation would be required.

Regarding the management of project-related wastes generated during construction and operation, staff reviews the applicant's proposed solid and hazardous waste management methods and determines if the methods meet the state standards for waste reduction and recycling. Staff then reviews the available off-site treatment and disposal sites and determines whether or not the proposed power plant's waste would have a significant impact on the disposal sites' allotted daily, yearly, or lifetime volume of waste it is allowed to receive. Staff uses a threshold of less than 10% impact on a waste disposal facility to determine if the impact would be significant.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Existing Contamination

The parcel is currently in agricultural production with pomegranate trees. Common agricultural practices can result in residual concentrations of fertilizers, pesticides or herbicides in near-surface soil. A Phase I Environmental Assessment (ESA) of the proposed dated May 9, 2006 was prepared in accordance with American Society for Testing and Materials practice E 1527-00. The Phase I ESA did not identify any Recognized Environmental Conditions on the PEC site thereby, eliminating the need for

a Phase II ESA (PEC 2006a). Although a Phase II ESA was not required, because the property is used for agriculture and there will be a large amount of ground disturbances, to protect the workers and reduce/eliminate damage to the environment the project owner should verify that no harmful concentrations of any contaminates will be encountered at the proposed project site. To ensure that the concentrations of various chemicals do not pose a potential health risk or hazard the project owners should provide soil sampling of the parcel/project site.

Using the Interim Guidance for Sampling Agricultural Fields for School Sites (Second Revision August 26, 2002) sponsored by the California Department of Toxic Substances Control (DTSC) Cal/EPA, the applicant identified what agricultural chemicals were used on the site, and chemicals or metals of potential concern. In accordance with DTSC guidance document, 40 soil samples were collected from the site and laydown area were analyzed for organochlorine pesticides and metals. The maximum concentration of each chemical detected in the on-site soil samples were less than California Human Health Screening Levels (CHHSL) for commercial/industrial land use established by the Cal/EPA and less than the detection limits specified in the DTSC guidance document. Arsenic was the only chemical on site higher than the commercial/industrial CHHSL of 0.24 mg/kg at 12.2 milligrams per kilogram (mg/kg). Studies performed by the United States Department of Interior, Geological Survey performed in the 1980s verified that background concentrations in the area range from 3.4 to 21 mg/kg. Therefore, the analytical results for arsenic are representative of background levels in the area verifying that there is need for remediation of any contamination (PEC 2006d).

Construction Impacts and Mitigation

Site preparation and construction of the proposed generating plant and associated facilities would last approximately 12 months, and would generate both nonhazardous and hazardous wastes in solid and liquid forms (PEC 2002a Section 3.4.8). Before construction can begin, the project owner would be required to develop and implement a Construction Waste Management Plan per proposed condition of certification **Waste-5**.

Metal debris from welding/cutting activities, packing materials, electrical wiring, and empty non-hazardous chemical containers would be generated during construction. Approximately 13 tons of waste metal and 34 tons of excess concrete are anticipated to be generated during construction. Nonhazardous solid wastes generated during construction would include up to 50 tons of wood, paper, glass, and plastic waste products comprised of excess lumber, packing materials, insulation, and empty non-hazardous chemical containers. (PEC 2006a Table 3.4-7). All non-hazardous wastes would be recycled to the extent possible and non-recyclable wastes would be collected by a licensed hauler and disposed of in a solid waste disposal facility, per Title 14, California Code of Regulations, §17200 et seq.

Nonhazardous liquid wastes would be generated during construction, and are discussed in the **Soil and Water Resources** section of this document. Storm water runoff would be managed in accordance with a Drainage, Erosion and Sediment Control Plan that would be prepared for the project and approved prior to construction. Other wastewaters would be sampled to determine their disposal.

Since excavation activities and trenching during construction of the proposed project may encounter potentially contaminated soils specific handling, disposal, and other precautions may be necessary per 22 CCR 66262.10. Staff finds that proposed conditions of certification **Waste-1** and **Waste-2** would be adequate to address any soil contamination contingency that may be encountered during construction of the project and would ensure compliance with 22 CCR 66262.10.

For hazardous waste, the designated Certified Unified Program Agency for SPP is the FCDCH, Environmental Health Division. The FCDCH, Environmental Health Division, assumes enforcement for the implementation of Title 23 of the CCR and regulates the generation, and storage of hazardous waste for the proposed project area. Hazardous wastes anticipated to be generated during construction include welding materials, waste paint, oil absorbents, gasoline and diesel fuel leaks, and lubricants (oil and grease). These amounts would be minor and if handled in the same manner as that described for the project site operation phase, would present an insignificant risk to workers and the public (PEC 2006a Section 5.14.2.1).

The construction contractor would be considered the generator of hazardous wastes at this site during the construction period and therefore, prior to construction, the project owner would be required to obtain a unique hazardous waste generator identification number from DTSC in accordance with DTSC regulatory authority, pursuant to proposed condition of certification **Waste-3**. Wastes would be accumulated at satellite locations and then transported daily to the construction contractor's 90-day hazardous waste storage area located in the construction laydown area. The wastes thus accumulated would be properly manifested, transported and disposed of at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies. Staff reviewed the disposal methods described in AFC Section 5.14.2.1 and concluded that all wastes would be disposed in accordance with all applicable LORS. Should any construction waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by proposed condition of certification **Waste-4,** to notify the Compliance Project Manager (CPM) whenever the owner becomes aware of this action.

Operation Impacts and Mitigation

The proposed PEC would generate both nonhazardous and hazardous wastes in solid and liquid forms under normal operating conditions. Before operations can begin, the project owner would be required to develop and implement an Operations Waste Management Plan pursuant to proposed condition of certification **Waste-5**.

Nonhazardous Solid Wastes

Nonhazardous solid wastes anticipated to be generated during operation include maintenance wastes and office wastes. Non-recyclable wastes would be regularly transported offsite to a local solid waste disposal facility (PEC 2006a Section 5.14.2.1.2 Table 5.14-3).

Nonhazardous Liquid Wastes

Nonhazardous liquid wastes would be generated during facility operation, and are discussed in the **Soil and Water Resources** section of this document. Storm water

runoff would be managed in accordance with a Drainage, Erosion and Sediment Control Plan. General facility drainage will consist of area washdown, sample drains, equipment leakage, and drainage from facility equipment areas and would be discharged to the waste water collection system. Water from the plant wastewater collection system will be disposed of via a well discharge to a geologic formation that is unsuitable for potable water production and isolated from aquifers (PEC 2006a Section 5.5.2.2).

Area drains will be located near mechanical equipment where it is determined that oil could mix with rainwater or other water sources. The water collected by these drains will go to the oil-water separator, which separates out any oil before the effluent goes to the collection tank via an underground drain line. The oil-contaminated fluid will be pumped out by a vacuum truck on an as-needed basis and disposed of at a facility specifically qualified to handle each waste (PEC 2006a Section 5.14.2.1.2).

Hazardous Wastes

The applicant or contractor would be the generator of hazardous wastes at this site during operations and thus the project owner's unique hazardous waste generator identification number obtained during construction would still be required for generation of hazardous waste, pursuant to proposed condition of certification **Waste-3**. Hazardous wastes anticipated to be generated during routine project operation include waste lubricating oil, lubrication oil filters from the combustion turbines, spent Selective Catalytic Reduction catalyst, oily rags, laboratory analysis waste, oil sorbents, and chemical feed area drainage. Table 5.14-2 of the AFC provides a list of wastes, the amounts expected to be generated, and their disposal methods.

The amounts of hazardous wastes generated during the operation of PEC would be minimal, and recycling methods would be used to the extent possible. The potential for accidental hazardous material release to the environment is extremely small (see **Hazardous Materials** section). Compliance existing LORS will ensure that the environment is protected. The remaining non-recyclable hazardous waste would be temporarily stored on-site, pursuant to the California Fire Code and Title 22, California Code of Regulations, Section 66262.10 et seq., and disposed of by licensed hazardous waste collection and disposal companies in accordance with all applicable regulations, pursuant to Title 22, California Code of Regulations, and Section 66262.10 et seq. Should any operations waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by proposed condition of certification **Waste-4** to notify the CPM whenever the owner becomes aware of this action.

Impact on Existing Waste Disposal Facilities

Nonhazardous Solid Wastes

Nonhazardous waste disposal sites suitable for discarding project-related construction and operation wastes are identified in Section 5.14.2 of the AFC (PEC 2006a Table 5.14-1). During construction of the proposed project, 97 tons of solid waste will be generated and disposed of in solid waste management landfills (PEC 2006a Table 3.4-7). The nonhazardous solid wastes generated yearly at PEC would be recycled if possible, or disposed of in a Class III landfill.

There are six landfills listed in Table 5.14-1 of the AFC, they are located in Fresno, Los Angeles and San Bernardino counties, combined there is over 33 million cubic yards of remaining capacity. The total amount of nonhazardous waste generated from project construction and operation will contribute less than 1% of available landfill capacity. Staff finds that disposal of the solid wastes generated by PEC can occur without significantly impacting the capacity or remaining life of any of these facilities.

Hazardous Wastes

Section 5.14.1.4 of the AFC discusses the two Class I landfills in California: The Clean Harbor Landfill in Kern County, and the Kettleman Hills Landfill in Kings County. The Kettleman Hills facility also accepts Class II and Class III wastes. In total, there is an excess of 16 million cubic yards of remaining hazardous waste disposal capacity at these landfills, with up to 16 years of remaining operating lifetimes. In addition, the Kettleman Hills facility is in the process of permitting an additional 15 million cubic yards of disposal capacity, and the Buttonwillow facility is not expected to reach its capacity until 2030 at current disposal rates (PEC 2006a Section 5.14.1.4). The amount of hazardous waste transported to these landfills has decreased in recent years due to source reduction efforts by generators and the transport of waste out of state that is hazardous under California law, but not federal law.

The SCR catalysts would require regeneration every three to five years resulting in the generation of a total of 500 pounds of waste material that could require disposal in a Class I facility if recycling or regeneration proves not to be feasible. All hazardous wastes generated during both construction and operation would be transported offsite to a permitted treatment, storage, or disposal facility for appropriate disposition, preferably recycling. The volume of hazardous waste from the PEC requiring off-site disposal would be far less than staff's threshold of significance (10% of the existing combined capacity of the three Class I landfills) and would therefore not significantly impact the capacity or remaining life of any of these facilities.

In the **Socioeconomics** section of this staff analysis, staff presents census tract information that shows that there are minority populations within one mile and six miles of the project. Since staff has added conditions of certification that would reduce the risk associated with hazardous waste to an insignificant level, staff concludes that there will be no significant impact from construction or operation of the power plant on` minority populations. Therefore, there are no environmental justice issues for Waste Management.

CUMULATIVE IMPACTS AND MITIGATION

There are two projects, Panoche, and Starwood proposed to be located in Fresno County. The projects list the same Class III, Solid Waste Landfills for non-hazardous waste disposal for construction and operation of the projects. The facilities are located in Fresno, Los Angeles, and San Bernardino counties. The combined capacity per year of the landfills total 2,324,010 tons per year of available operating capacity. The combined waste generated at the two facilities would require less than 1% of the capacity of any one of the solid waste landfills.

As proposed, the quantities hazardous wastes generated during construction and operation of the two projects would add to the total quantities of waste generated in the State of California. Overall, wastes would be generated in minimal quantities, recycling efforts would be prioritized wherever practical, and capacity is available in a variety of treatment and disposal facilities. Therefore, staff concludes that these added waste quantities generated by the three projects would not result in significant cumulative waste management impacts.

COMPLIANCE WITH LORS

Energy Commission staff concludes that the PEC would comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during facility demolition, construction and operation. The applicant is required to dispose of hazardous and non-hazardous wastes at facilities approved by the various departments within Cal/EPA. Because hazardous wastes would be produced during both project construction and operation, the PEC project would be required to obtain a hazardous waste generator identification number from DTSC. Accordingly, PEC would be required to properly store, package and label waste, use only approved transporters, prepare hazardous waste manifests, keep detailed records, and appropriately train employees. Pursuant to California Code of Regulations, the PEC must prepare Title 22, section 67100.1 et seq., a hazardous waste Source Reduction, Evaluation Review, and Plan.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has not received comments from DTSC or the public.

CONCLUSIONS

Staff has proposed conditions of certification **Waste-1** through **5** which require: **1)** the project owner have an experienced Registered Professional Engineer or Geologist available for consultation during soil excavation and grading activities in the event that contaminated soils are encountered; **2**) if potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities, the Registered Professional Engineer or Geologist shall inspect the site, determine the need for sampling nature, file a written report, and seek guidance from the Compliance Project Manager (CPM) and the appropriate regulatory agencies; **3)** the project owner shall obtain a unique hazardous waste generator identification number from the DTSC in accordance with DTSC regulatory authority; **4)** the project owner shall notify the CPM whenever the owner becomes aware of any impending waste management-related enforcement action; and **5**) the project owner shall prepare and submit waste management plans for all wastes generated during construction and operation of the facility and submit them to the CPM.

Management of the waste generated during construction and operation of the Panoche Energy Center (PEC) or those associated with remediation of existing on-site contamination would not result in any significant adverse impacts if the measures and remediation proposed in the Application for Certification (AFC) and Staff's proposed conditions of certification were implemented. With staff's proposed mitigation, potential

waste management impacts have been reduced to less than significant for all people within the affected area, including the minority population.

PROPOSED CONDITIONS OF CERTIFICATION

WASTE-1 The project owner shall provide the resume of a Registered Professional Engineer or Geologist, who shall be available for consultation during soil excavation and grading activities, to the Compliance Project Manager (CPM) for review and approval. The resume shall show experience in remedial investigation and feasibility studies.

The Registered Professional Engineer or Geologist shall be given full authority by the project owner to oversee any earth moving activities that have the potential to disturb contaminated soil.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit the resume to the CPM for review and approval.

WASTE-2 If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the Registered Professional Engineer or Geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner representatives of Department of Toxic Substances Control, and CPM stating the recommended course of action and obtain approvals from the Department of Toxic Substances Control.

Depending on the nature and extent of contamination, the Registered Professional Engineer or Geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the Registered Professional Engineer or Geologist, significant remediation may be required, the project owner shall contact representatives of the Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall submit any final reports filed by the Registered Professional Engineer or Geologist to the CPM within 5 days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

WASTE-3 The project owner shall obtain a hazardous waste generator identification number from the Department of Toxic Substances Control prior to generating any hazardous waste during construction and operations.

Verification: The project owner shall keep its copy of the identification number on file at the project site and notify the CPM via the relevant Monthly Compliance Report of its receipt.

WASTE-4 Upon becoming aware of any impending waste management-related enforcement action by any local, state, or federal authority, the project

owner shall notify the CPM of any such action taken or proposed to be taken against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the manner in which project-related wastes are managed.

WASTE-5 The project owner shall prepare a Construction Waste Management Plan and an Operation Waste Management Plan for all wastes generated during construction and operation of the facility, respectively, and shall submit both plans to the CPM for review and approval. The plans shall contain, at a minimum, the following:

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

Verification: No less than 30 days prior to the start of site mobilization, the project owner shall submit the Construction Waste Management Plan to the CPM for approval.

The Operation Waste Management Plan shall be submitted to the CPM no less than 30 days prior to the start of project operation for approval. The project owner shall submit any required revisions within 20 days of notification by the CPM.

In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year and provide a comparison of the actual methods used to those the planned management methods proposed in the original Operation Waste Management Plan.

REFERENCES

PEC 2006a. Panoche Energy Center Project. Application for Certification for the Panoche Energy Center Project. Volumes 1 and 2. Submitted to the California Energy Commission, August 2, 2006.

PEC 2006b. Panoche Energy Center Project. Supplement to the Application for Certification for the Panoche Energy Center Project. Submitted to the California Energy Commission, November 7, 2006.

PEC 2006d. Panoche Energy Center Project... Data, Responses to Data Requests 1-60 for the Panoche Energy Center Project. Submitted to the California Energy Commission, January 9, 2007.

WORKER SAFETY AND FIRE PROTECTION

Rick Tyler and Alvin Greenberg PhD

SUMMARY OF CONCLUSIONS

Staff concluded that if the applicant for the proposed Panoche Energy Center (PEC) provides a Project Construction Safety and Health Program and a Project Operations and Maintenance Safety and Health Program, as required by Conditions of Certification **WORKER SAFETY -1, -2, -3, -4,** and **-5,** the project would incorporate sufficient measures to ensure adequate levels of industrial safety, and comply with applicable laws, ordinances, regulations, and standards. The proposed conditions of certification provide assurance that the Construction Safety and Health Program and the Operations and Maintenance Safety and Health Program proposed by the applicant will be reviewed by the appropriate agencies before implementation. The conditions also require verification that the proposed plans adequately assure worker safety and fire protection and comply with applicable laws, ordinances, regulations, and standards.

Staff also concludes that the proposed project would not have significant impacts on local fire protection services. The proposed facility will be located on a large agricultural plot currently planted with pomegranate trees. The fire risks of the proposed facility do not pose significant added demands on local fire protection services. Staff also concludes that the Fresno County Fire Protection Division, Mendota Station Hazardous Materials Response Unit is adequately equipped and staffed to respond to a minor hazardous materials incident at the proposed facility with an adequate response time.

INTRODUCTION

Worker safety and fire protection is regulated through laws, ordinances, regulations, and standards (LORS), at the federal, state, and local levels. Industrial workers at the facility operate equipment and handle hazardous materials daily and may face hazards that can result in accidents and serious injury. Protection measures are employed to eliminate or reduce these hazards or to minimize the risk through special training, protective equipment and procedural controls.

The purpose of this Preliminary Staff Assessment (PSA) is to assess the worker safety and fire protection measures proposed by the Panoche Energy Center (PEC) and to determine whether the applicant has proposed adequate measures to:

- comply with applicable safety LORS;
- protect the workers during construction and operation of the facility;
- protect against fire; and
- provide adequate emergency response procedures.

WORKER SAFETY AND FIRE PROTECTION Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
29 U.S. Code sections 651 et seq (Occupational Safety and Health Act of 1970)	This Act mandates safety requirements in the workplace with the purpose of "[assuring] so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources" (29 USC § 651).
29 CFR sections 1910.1 to 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations)	These sections define the procedures for promulgating regulations and conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector.
29 CFR sections 1952.170 to 1952.175	These sections provide Federal approval of California's plan for enforcement of its own Safety and Health requirements, in lieu of most of the Federal requirements found in 29 CFR §1910.1 to 1910.1500.
State	
8 CCR all applicable Sections (Cal/OSHA regulations)	Requires that all employers follow these regulations as they pertain to the work involved. This includes regulations pertaining to safety matters during construction, commissioning, and operations of power plants, as well as safety around electrical components, fire safety, and hazardous materials use, storage, and handling.
24 CCR section 3, et seq.	Incorporates the current addition of the Uniform Building Code.
Health and Safety Code section 25500, et seq.	Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at a facility.
Health and Safety Code sections 25500 to 25541	Requires a Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at a facility
Local	
1998 Edition of California Uniform Fire Code and all applicable NFPA standards (24CCRPart9)	National Fire Protection Act (NFPA) standards are incorporated into the California Uniform Fire Code (UFC). The fire code contains general provisions for fire safety, including: 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 incorporates current editions of the UFC standards.

Applicable Law	Description
California Building Code Title 24, California Code of Regulations (24 CCR § 3, et seq.)	Comprised of eleven parts containing the building design and construction requirements relating to fire and life safety and structural safety. The California Building Standards Code incorporates current editions of the Uniform Building Code and includes the electrical, mechanical, energy, and fire codes applicable to the project.
Uniform Fire Code, 1997	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.

SETTING

Fire support services to the site will be under the jurisdiction of the Fresno County Fire Protection Division (FCFPD). The closest FCFPD station is No. 96 located at 101 McCabe, Mendota, with an approximate response time of 15-20 minutes, and would provide first response to a fire at the project site. (PEC 2006a).

The Fresno County Fire Protection Division, Mendota Station, Hazardous Materials Response Unit located at the Mendota Station No. 96, is considered the first responder for hazardous materials incidents. They are adequate to handle minor hazardous material incidents. In the unlikely event of a major hazardous materials incident the Emergency Response Team from the City of Fresno will be the second responder. Their response time from the city of Fresno will be about an hour. (Mendez 2007, pers. comm.)

Staff determined that the response time is adequate and consistent with the UFC and the NFPA.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Two issues are assessed in Worker Safety-Fire Protection:

1. The potential for impacts on the safety of workers during demolition, construction, and operations activities, and

2. Fire prevention/protection, emergency medical response, and hazardous materials spill response during demolition, construction, and operations.

Worker safety issues are a matter of adhering to the spirit and intent of the Cal-OSHA regulations. This is essentially a LORS compliance matter, and if all LORS are followed, workers will be adequately protected. Thus, the standard for staff's review and determination of significant impacts on workers is whether or not the applicant has demonstrated adequate knowledge about and dedication to implementing all pertinent and relevant Cal-OSHA standards.

Regarding fire prevention matters, staff reviews and evaluates the on-site fire-fighting systems proposed by the applicant and the time needed for off-site local fire departments to respond to a fire, medical, or hazardous material emergency at the proposed power plant site. If on-site systems do not follow established codes and industry standards, staff recommends additional measures. Staff reviews and evaluates the local fire department capabilities in each area, the response time, and interviews the local fire officials to determine if they feel adequately trained, manned, and equipped to respond to the needs of a power plant. Staff then determines if the presence of the power plant would cause a significant impact on a local fire department. If it does, staff will recommend that the applicant mitigate this impact by providing increased resources to the fire department.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Worker Safety

Industrial environments are potentially dangerous during construction and operation of facilities. Workers at the proposed project will be exposed to loud noises, moving equipment, trenches, and confined space entry and egress problems. The workers may experience falls, trips, burns, lacerations, and numerous other injuries. They have the potential to be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks and electrocution. It is important for the PEC to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers. If the facility complies with all LORS, workers will be adequately protected from health and safety hazards.

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 PEC encompasses construction and operation of a natural gas fired-facility. Workers will be exposed to hazards typical of construction and operation of a gas-fired simple cycle facility.

Construction Safety Orders are published at 8 CCR sections 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 Prevention Plan (8 CCR § 1920)
- Personal Protective Equipment Program (8 CCR §§ 1514 - 1522)

- Emergency Action Program and Plan

Additional programs under General Industry Safety Orders (8 CCR §§ 3200 to 6184), Electrical Safety Orders (8 CCR §§2299 to 2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450 to 544) will include:

- Electrical Safety Program
- Accident/Incident Reporting Procedures
- Blood-borne Pathogens Exposure Control Program
- Chemical Hygiene Plan
- Code of Safe Practices for Equipment and Operation
- Compressed Gas and Air Handling Systems
- Emergency Action Plan
- Emergency Response Procedures
- Fire Protection and Prevention Plan
- Hazardous Materials Handling Procedures
- Hoist/Chain/Wire Rope/Webs/Rope Slings/Cranes
- Industrial Hygiene Program
- Lock Out/Tag Out Procedure
- PPE Program
- Portable Electric and Pneumatic Tools
- Repetitive Stress Injuries/ Ergonomics/Lifting Hazards
- Safety and Housekeeping Inspection Program
- Safety Committee and Toolbox/Tailgate Safety Meetings
- Security Program
- Stop Work Authority
- Signs, Tags and Barricades
- Motor Vehicle and Heavy Equipment Safety Program;
- Forklift Operation Program;
- Excavation/Trenching Program;
- Fall Protection Program;
- Scaffolding/Ladder Safety Program;
- Articulating Boom Platforms Program;
- Crane and Material Handling Program;
- Housekeeping and Material Handling and Storage Program;

- Respiratory Protection Program;
- Employee Exposure Monitoring Program;
- Hand and Portable Power Tool Safety Program;
- Hearing Conservation Program;
- Back Injury Prevention Program;
- Hazard Communication Program;
- Heat and Cold Stress Monitoring and Control Program;
- Pressure Vessel and Pipeline Safety Program;
- Hazardous Waste Program;
- Hot work Safety Program;
- Permit-Required Confined Space Entry Program; and
- Demolition Procedure (if applicable).

The AFC includes adequate outlines of each of the above programs (PEC 2006a). Prior to the start of construction of the PEC, detailed programs and plans will be provided pursuant to the Condition of Certification **WORKER SAFETY-1.**

Operations and Maintenance Safety and Health Program

Prior to the start of operations at the PEC, the Operations and Maintenance Safety and Health Program will be prepared. This operational safety program will include the following programs and plans:

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

In addition, the requirements under General Industry Safety Orders (8 CCR §§ 3200 to 6184), Electrical Safety Orders (8 CCR §§2299 to 2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450 to 544) will be applicable to the project. Written safety programs for the PEC, which the applicant will develop, will ensure compliance with the above-mentioned requirements.

The AFC includes adequate outlines of the Injury and Illness Prevention Program, Emergency Action Plan, Fire Prevention Program, and Personal Protective Equipment Program (PEC 2006a). Prior to operation of the PEC, all detailed programs and plans will be provided pursuant to Condition of Certification **WORKER SAFETY-2.**

Safety and Health Program Elements

As mentioned above, the applicant provided the proposed outlines for both a Construction Safety and Health Program and an Operations Safety and Health

Program. The measures in these plans are derived from applicable sections of state and federal law. The major items required in both Safety and Health Programs are as follows:

Injury and Illness Prevention Program (IIPP)

The IIPP will include the following components as presented in the AFC (PEC 2006a):

- identity of person(s) with authority and responsibility for implementing the program;
- establish safety and health policy of the plan;
- define work rules and safe work practices for construction activities;
- system for ensuring that employees comply with safe and healthy work practices;
- system for facilitating employer-employee communications;
- procedures for identifying and evaluating workplace hazards and developing necessary program(s);
- methods for correcting unhealthy/unsafe conditions in a timely manner;
- determine and establish training and instruction requirements and programs; and
- specify safety procedures.

Fire Prevention Plan

California Code of Regulations requires an Operations Fire Prevention Plan (8 CCR § 3221). The AFC outlines a proposed Fire Prevention Plan which is acceptable to staff (PEC 2006a). The plan will include the following topics:

- determine general program requirements;
- determine fire hazard inventory, including ignition sources and mitigation;
- develop good housekeeping practices and proper materials storage;
- establish employee alarm and/or communication system(s);
- provide portable fire extinguishers at appropriate site locations;
- locate fixed fire fighting equipment in suitable areas;
- specify fire control requirements and procedures;
- establish proper flammable and combustible liquid storage facilities;
- identify the location and use of flammable and combustible liquids;
- provide proper dispensing and determine disposal requirements for flammable liquids;
- establish and determine training and instruction requirements and programs; and
- identify personnel to contact for information on plan contents.

Staff proposes that the applicant submit a final Fire Prevention Plan to the California Energy Commission Compliance Project Manager (CPM) for review and approval and

to the PEC for review and comment to satisfy proposed Conditions of Certification **WORKER SAFETY-1 and WORKER SAFETY-2.**

Personal Protective Equipment Program

California regulations require Personal Protective Equipment (PPE) and first aid supplies whenever hazards are present that due to process, environment, chemicals or mechanical irritants, can cause injury or impair bodily function as a result of absorption, inhalation or physical contact (8 CCR sections 3380 to 3400). The PEC operational environment will require PPE.

All safety equipment must meet National Institute of Safety and Health (NIOSH) or American National Standards Institute (ANSI) standards and will carry markings, numbers, or certificates of approval. Respirators must meet NIOSH and Cal/OSHA standards. Each employee must be provided with the following information pertaining to the protective clothing and equipment:

- proper use, maintenance, and storage;
- when the protective clothing and equipment are to be used;
- benefits and limitations; and
- when and how the protective clothing and equipment are to be replaced.

The PPE Program ensures that employers comply with the applicable requirements for PPE and provides employees with the information and training necessary to protect them from potential workplace hazards.

Emergency Action Plan

California regulations require an Emergency Action Plan (8 CCR § 3220). The AFC contains a satisfactory outline for an emergency action plan (PEC 2006a).

The outline lists the following features:

- establish emergency escape procedures and emergency escape route for the facility;
- determine procedures to be followed by employees who remain to operate critical plant operations before they evacuate;
- provide procedures to account for all employees and visitors after emergency evacuation of the plant has been completed;
- specify rescue and medical duties for assigned employees;
- identify fire and emergency reporting procedures to regulatory agencies;
- develop alarm and communication system for the facility;
- establish a list of personnel to contact for information on the plan contents;
- provide emergency response procedures for ammonia release; and
- determine and establish training and instruction requirements and programs.

Written Safety Program

In addition to the specific plans listed above, additional LORS apply to the project, called "safe work practices." Both the Construction and the Operations Safety Programs will address safe work practices under a variety of programs. The components of these programs include, but are not limited to, the programs found under the heading Construction Safety and Health Program of this staff assessment:

- In addition, the project owner would be required to provide personal protective equipment and exposure monitoring for workers who are involved in activities on sites where contaminated soil and/or contaminated groundwater exist as per staff's proposed Conditions of Certification **WORKER SAFETY-1** and-2.

These proposed Conditions of Certification would ensure that workers are properly protected from any hazardous wastes presently at the site.

Safety Training Programs

Employees will be trained in the safe work practices described in the above-referenced safety programs.

Additional Mitigation Measures

Protecting construction workers from injury and disease is among the greatest challenges in occupational safety and health. The following facts are reported by the National Institute for Occupational Safety and Health (NIOSH):

- More than 7 million persons work in the construction industry, representing 6% of the labor force. Approximately 1.5 million of these workers are self-employed.
- Of approximately 600,000 construction companies, 90% employ fewer than 20 workers. Few have formal safety and health programs.
- From 1980-1993, an average of 1,079 construction workers were killed on the job each year, more fatal injuries than in any other industry.
- Falls caused 3,859 construction worker fatalities (25.6%) between 1980 and 1993.
- 15% of workers' compensation costs are spent on construction injuries.
- Assuring safety and health in construction is complex, involving short-term work sites, changing hazards, and multiple operations and crews working in close proximity.
- In 1990, Congress directed NIOSH to undertake research and training to reduce diseases and injuries among construction workers in the United States. Under this mandate, NIOSH funds both intramural and extramural research projects.

The hazards associated with the construction industry are thus well documented. These hazards increase in complexity in the multi-employer worksites typical of large complex industrial type projects such as the construction of gas-fired power plants. In order to reduce and/or eliminate these hazards, it has become standard industry practice to hire a Construction Safety Supervisor to ensure a safe and healthful environment for all personnel. This has been evident in the audits of power plants under construction recently conducted by the staff. The Federal Occupational Safety and Health

Administration (OSHA) has also entered into strategic alliances with several professional and trade organizations to promote and recognize safety professionals trained as Construction Safety Supervisors, Construction Health and Safety Officers, and other professional designations. The goal of these partnerships is to encourage construction subcontractors to improve their safety and health performance; to assist them in striving for the elimination of the four hazards (falls, electrical, caught in/between and struck-by hazards), which account for the majority of fatalities and injuries in this industry and have been the focus of targeted OSHA inspections; to prevent serious accidents in the construction industry through implementation of enhanced safety and health programs and increased employee training; and to recognize those subcontractors with exemplary safety and health programs.

To date, there are no OSHA or Cal-OSHA requirements that an employer hire or provide for a Construction Safety Officer. OSHA and Cal-OSHA regulations do, however, require that safety be provided by an employer and the term "Competent Person" is used in many OSHA and Cal-OSHA standards, documents, and directives. A "Competent Person" is usually defined by OSHA as an individual who, by way of training and/or experience, is knowledgeable of standards, is capable of identifying workplace hazards relating to the specific operations, is designated by the employer, and has authority to take appropriate action. Therefore, in order to meet the intent of the OSHA standard to provide for a safe workplace during power plant construction, staff proposes Condition of Certification **WORKER SAFETY-3** which would require the applicant/project owner to designate and provide for a power plant site Construction Safety Supervisor.

As discussed above, the hazards associated with the construction industry are well documented. These hazards increase in complexity in the multi-employer worksites typical of large complex industrial type projects such as the construction of gas-fired power plants.

Accidents, fires, and a worker death have occurred at Energy Commission-certified power plants in the recent past due to the failure to recognize and control safety hazards and the inability to adequately supervise compliance with occupational safety and health regulations. Safety problems have been documented by Energy Commission staff in safety audits conducted in 2005 at several power plants under construction. The findings of the audit staff include, but are not limited to, such safety oversights as:

- Lack of posted confined space warning placards/signs;
- Confusing and/or inadequate electrical and machinery lockout/tagout permitting and procedures;
- Confusing and/or inappropriate procedures for handing over lockout/tagout and confined space permits from the construction team to commissioning team and then to operations;
- Dangerous placement of hydraulic elevated platforms under each other;
- Inappropriate placement of fire extinguishers near hotwork;

- Dangerous placement of numerous power cords in standing water on the site thus increasing the risk of electrocution; and
- Inappropriate and unsecured placement of above-ground natural gas pipelines inside the facility but too close to the perimeter fence.
- Lack of adequate employee or contractor written training programs addressing proper procedures to follow in the event of finding suspicious packages or objects either on- or off-site.

In order to reduce and/or eliminate these hazards, it is necessary for the Energy Commission to have a safety professional monitor on-site compliance with Cal-OSHA regulations and periodically audit safety compliance during construction, commissioning, and the hand-over to operational status. These requirements are outlined in Condition of Certification **WORKER SAFETY-4.** A monitor, hired by the project owner yet reporting to the CBO and CPM, will serve as an "extra set of eyes" to ensure that safety procedures and practices are fully implemented at all power plants certified by the Energy Commission. During the audits conducted by staff, most site safety professionals welcomed the audit team and actively engaged them in questions about the team's findings and recommendations. These safety professionals recognized that safety requires continuous vigilance and that the presence of an independent audit team provided a "fresh perspective" of the site.

Fire Hazards

During construction and operation of the proposed PEC there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, natural gas, hydraulic fluid, mineral oil, insulating fluid at the power plant switchyard or flammable liquids, explosions, and over-heated equipment, may cause small fires. Major structural fires in areas without automatic fire detection and suppression systems are unlikely to develop at power plants. Fires and explosions of natural gas or other flammable gasses or liquids are rare. Compliance with all LORS will be adequate to assure protection from all fire hazards.

The project will rely on both onsite fire protection systems and local fire protection services. The onsite fire protection system provides the first line of defense for small fires. In the event of a major fire, fire support services, including trained firefighters and equipment for a sustained response, would be provided by the Fresno County Fire Protection Division, Mendota Station (PEC 2006a, Page 5.17-15).

Construction

During construction, portable fire extinguishers will be located throughout the site, and safety procedures and training will be implemented. In addition, Fresno County Fire Protection Division, Mendota Station will provide fire protection backup for larger fires that can not be extinguished using the portable suppression equipment.

Operation

The information in the AFC indicates that the project intends to meet the fire protection and suppression requirements of the California Fire Code, all applicable recommended NFPA standards (including Standard 850 addressing fire protection at electric

generating plants), and all Cal-OSHA requirements. Fire suppression elements in the proposed plant will include both fixed and portable fire extinguishing systems. The fire water will be supplied from brackish ground water wells. raw water storage tank and delivered to the underground firewater loop with fire hydrants at approximately 300-foot intervals. (PEC 2006a).

A FM-200 fire protection system will be provided for the combustion turbine generators and accessory equipment. The system will have fire detection sensors that will trigger alarms, turn off ventilation, close ventilation openings, and automatically release the FM-200 gas (PEC 2006a).

In addition to the fixed fire protection system, smoke detectors, flame detectors, temperature detectors, and appropriate class of service portable extinguishers and fire hydrants must be located throughout the facility at code-approved intervals. These systems are standard requirement by the NFPA and the UFC and staff has determined that they will ensure adequate fire protection.

The applicant would be required by **Worker Safety-1** and-2 to provide the final Fire Protection and Prevention Program to staff and to the Fresno County Fire Protection Division, Mendota Station prior to construction and operation of the project, to confirm the adequacy of the proposed fire protection measures.

Emergency Medical Response

A state-wide survey was conducted by staff to determine the frequency of emergency medical response (EMS) and fire-fighter response for natural gas-fired power plants in California. The purpose of the analysis was to determine what impact, if any, power plants may have on local emergency services. Staff has concluded that incidents at power plants that require fire or EMS response are infrequent and represent an insignificant impact on the local fire departments, except for rare instances where a rural fire department has mostly volunteer fire-fighting staff. However, staff has determined that the potential for both work-related and non-work related heart attacks exists at power plants. In fact, staff's research on the frequency of EMS response to gas-fired power plants shows that many of the responses are for cardiac emergencies involving non-work related incidences, including visitors. The need for prompt response within a few minutes is well documented in medical literature. Staff believes that the quickest medical intervention can only be achieved with the use of an on-site defibrillator; the response from an off-site provider would take longer regardless of the provider location. This fact is also well documented and serves as the basis for many private and public locations (e.g., airports, factories, government buildings) maintaining on-site cardiac defibrillation devices. Therefore, staff concludes that with the advent of modern cost-effective cardiac defibrillation devices, it is proper in a power plant environment to maintain such a devise on-site in order to convert cardiac arrhythmias resulting from industrial accidents or other non-work related causes. Therefore, an additional condition of certification (**WORKER SAFETY-5**) is proposed which would require that a portable automatic cardiac defibrillator be located on site.

CUMULATIVE IMPACTS AND MITIGATION

Staff reviewed the potential for the construction and operation of PEC combined with the existing industrial facilities and expected new facilities to result in impacts on the and emergency service capabilities of the Fresno County Fire Protection Division Mendota Station, and determined that cumulative impacts were insignificant. Given the agricultural area where the project is proposed to be built, and the lack of unique fire hazards associated with a modern gas-fired power plant, staff concludes that this project will not have any significant incremental burden on the department's ability to respond to a fire or medical emergency.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No agency or public comments were received relating to worker safety and fire protection.

CONCLUSIONS

Staff concluded that if the applicant for the proposed PEC provides a Project Construction Safety and Health Program and a Project Operations and Maintenance Safety and Health Program as required by Conditions of Certification **WORKER SAFETY -1,** and **-2;** and fulfils the requirements of **WORKER SAETY-3** through-5, the project would incorporate sufficient measures to ensure adequate levels of industrial safety and comply with applicable LORS. Staff also concludes that the proposed project would not have significant impacts on local fire protection services.

PROPOSED CONDITIONS OF CERTIFICATION

WORKER SAFETY-1 The project owner shall submit to the Compliance Project Manager (CPM) a copy of the Project Construction Safety and Health Program containing the following:

- A Construction Personal Protective Equipment Program;
- A Construction Exposure Monitoring Program;
- A Construction Injury and Illness Prevention Program;
- A Construction Emergency Action Plan; and
- A Construction Fire Prevention Plan.

The Personal Protective Equipment Program, the Exposure Monitoring Program, and the Injury and Illness Prevention Program shall be submitted to the CPM for review and approval concerning compliance of the program with all applicable Safety Orders. The Construction Emergency Action Plan and the Fire Prevention Plan shall be submitted to the Fresno County Fire Protection Division, Mendota Station for review and comment prior to submittal to the CPM for approval. All additional programs required under General Industry Safety Orders (8 CCR §§ 3200 to 6184), Electrical Safety Orders (8 CCR §§2299 to 2974) and Unfired Pressure Vessel

Safety Orders (8 CCR §§ 450 to 544) shall be included in the submittal to the CPM.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the Project Construction Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the Fresno County Fire Protection Division, Mendota Station stating the fire department's comments on the Construction Fire Prevention Plan and Emergency Action Plan.

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

- An Operation Injury and Illness Prevention Plan;
- An Emergency Action Plan;
- Hazardous Materials Management Program;
- Fire Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the CPM for review and comment concerning compliance of the program with all applicable Safety Orders. The Operation Fire Prevention Plan and the Emergency Action Plan shall also be submitted to the Fresno County Fire Protection Division, Mendota Station for review and comment.

Verification: At least 30 days prior to the start of first-fire or commissioning, the project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the Fresno County Fire Protection Division, Mendota Station stating the Fire Department's comments on the Operations Fire Prevention Plan and Emergency Action Plan.

WORKER SAFETY-3 The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant laws, ordinances, regulations, and standards, is capable of identifying workplace hazards relating to the construction activities, and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

- Have over-all authority for coordination and implementation of all occupational safety and health practices, policies, and programs;
- Assure that the safety program for the project complies with Cal/OSHA & federal regulations related to power plant projects;

- Assure that all construction and commissioning workers and supervisors receive adequate safety training;
- Complete accident and safety-related incident investigations, emergency response reports for injuries, and inform the CPM of safety-related incidents; and
- Assure that all the plans identified in Worker Safety 1 and 2 are implemented.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM the name and contact information for the Construction Safety Supervisor (CSS). The contact information of any replacement (CSS) shall be submitted to the CPM within one business day.

The CSS shall submit in the Monthly Compliance Report a monthly safety inspection report to include:

- Record of all employees trained for that month (all records shall be kept on site for the duration of the project);
- Summary report of safety management actions and safety-related incidents that occurred during the month;
- Report of any continuing or unresolved situations and incidents that may pose danger to life or health; and
- Report of accidents and injuries that occurred during the month.

WORKER SAFETY-4 The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO, and will be responsible for verifying that the Construction Safety Supervisor, as required in Worker Safety 3, implements all appropriate Cal/OSHA and Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

Verification: Prior to the start of construction, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.

WORKER SAFETY-5 The project owner shall ensure that a portable automatic cardiac defibrillator is located on site during construction and operations and shall implement a program to ensure that workers are properly trained in its use and that the equipment is properly maintained and functioning at all times.

Verification: At least 30 days prior to the start of site mobilization the project owner shall submit to the CPM proof that a portable automatic cardiac defibrillator exists on site and a copy of the training and maintenance program for review and approval.

REFERENCES

California Fire Code 1998. Published by the International Fire Code Institute comprised of the International Conference of Building Officials, the Western Fire Chiefs Association, and the California Building Standards Commission. Whittier, Ca.

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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.

ENGINEERING ASSESSMENT

FACILITY DESIGN

Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

Staff concludes that the design, construction and eventual closure of the project and its linear facilities would likely comply with applicable engineering laws, ordinances, regulations and standards. The proposed Conditions of Certification, below, would ensure compliance with these laws, ordinances, regulations and standards.

INTRODUCTION

Facility Design encompasses the civil, structural, mechanical and electrical engineering design of the project. The purpose of the Facility Design analysis is to:

- verify that the laws, ordinances, regulations and standards (LORS) applicable to the engineering design and construction of the project have been identified;
- verify that the project and ancillary facilities have been described in sufficient detail, including proposed design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable engineering LORS, and in a manner that assures public health and safety;
- determine whether special design features should be considered during final design to deal with conditions unique to the site which could influence public health and safety; and
- describe the design review and construction inspection process and establish Conditions of Certification that will be used to monitor and ensure compliance with the engineering LORS and any special design requirements.

Subjects discussed in this analysis include:

- Identification of the engineering LORS applicable to facility design;
- Evaluation of the applicant's proposed design criteria, including the identification of those criteria that are essential to ensuring public health and safety;
- Proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable engineering LORS; and
- Conditions of Certification proposed by staff to ensure that the project will be designed and constructed to assure public health and safety and comply with all applicable engineering LORS.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Lists of LORS applicable to each engineering discipline (civil, structural, mechanical and electrical) are described in the AFC (PEC 2006a, Appendices C through H, and L). The key LORS are listed in **Facility Design Table 1** below:

FACILITY DESIGN Table 1
Key Engineering Laws, Ordinances, Regulations and Standards (LORS)

Applicable LORS	Description
Federal	Title 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
State	2001 California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations)
Local	Fresno County, Regulations and Ordinances
General	American National Standards Institute (ANSI) American Society of Mechanical Engineers (ASME) American Welding Society (AWS) American Society for Testing and Materials (ASTM)

SETTING

The Panoche Energy Center (PEC) will be built on a 12.8-acre site, located in an unincorporated area within Fresno County, approximately 50 miles west of the city of Fresno. The site lies in seismic zone 4. For more information on the site and related project description, please see the **Project Description** section of this document. Additional engineering design details are contained in the Application for Certification (AFC), in Appendices C through H, and L (PEC 2006a).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The purpose of this analysis is to ensure that the project is built to the applicable engineering codes in order to ensure public health and life safety. The analysis verifies that the applicable engineering LORS have been identified and that the project and ancillary facilities have been described in sufficient detail. It also evaluates the applicant's proposed design criteria, describes the design review and construction inspection process, and establishes Conditions of Certification to monitor and ensure compliance with the engineering LORS and any special design requirements. These conditions allow the Energy Commission Compliance Project Manager (CPM) and the applicant to adopt a compliance monitoring scheme that will verify compliance with these LORS.

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 natural gas and electric transmission interconnections. The applicant proposes to use accepted industry standards (see PEC 2006a, Appendices C through H, and L for a representative list of applicable industry standards), design practices and construction methods in preparing and developing the site. Staff concludes that the project, including its linear facilities, would most likely

comply with all applicable site preparation LORS, and proposes Conditions of Certification (see below and the **Geology and Paleontology** section of this document) to ensure compliance.

MAJOR STRUCTURES, SYSTEMS AND EQUIPMENT

Major structures, systems and equipment are defined as those structures and associated components or equipment that are necessary for power production and are costly or time consuming to repair or replace, that are used for the storage, containment, or handling of hazardous or toxic materials, or may become potential health and safety hazards if not constructed according to the applicable engineering LORS. Major structures and equipment will be identified through compliance with proposed Condition of Certification **GEN-2** (below).

The AFC contains lists of the civil, structural, mechanical and electrical design criteria that demonstrate the likelihood of compliance with applicable engineering LORS, and that staff believes are essential to ensuring that the project is designed in a manner that protects public health and safety.

The project shall be designed and constructed to the 2001 edition of the California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations), which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and other applicable codes and standards in effect at the time design and construction of the project actually commences. In the event the initial designs are submitted to the Chief Building Official (CBO) for review and approval when the successor to the 2001 CBSC is in effect, the 2001 CBSC provisions, identified herein, shall be replaced with the applicable successor provisions.

Certain structures in a power plant may be required, under the CBC, to undergo dynamic lateral force (structural) analysis; others may be designed using the simpler static analysis procedure. In order to ensure that structures are analyzed using the appropriate lateral force procedure, staff has included 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.

PROJECT QUALITY PROCEDURES

The AFC (PEC 2006a, § 3.11.8) describes a project Quality Program that will be used on the PEC project to maximize confidence that systems and components will be designed, fabricated, stored, transported, installed and tested in accordance with the technical codes and standards appropriate for a power plant. Compliance with design requirements will be verified through an appropriate program of inspections and audits. Employment of this quality assurance/quality control (QA/QC) program would ensure that the project is actually designed, procured, fabricated, and installed as contemplated in this analysis.

COMPLIANCE MONITORING

Under Section 104.2 of the CBC, the building official is authorized and directed to enforce all the provisions of the CBC. For all energy facilities certified by the Energy Commission, the Energy Commission is the building official and has the responsibility to enforce the code. In addition, the Energy Commission has the power to render interpretations of the CBC and to adopt and enforce rules and supplemental regulations to clarify the application of the CBC's provisions.

The Energy Commission's design review and construction inspection process is developed to conform to CBC requirements and to ensure that all facility design Conditions of Certification are met. As provided by Section 104.2.2 of the CBC, the Energy Commission appoints experts to carry out the design review and construction inspections and act as delegate CBO on behalf of the Energy Commission. These delegates typically include the local building official and/or independent consultants hired to provide technical expertise not provided by the local official. The applicant, through permit fees as provided by CBC Sections 107.2 and 107.3, pays the costs of the reviews and inspections. While building permits in addition to the Energy Commission certification are not required for this project, in lieu permit fees are paid by the applicant consistent with CBC Section 107, to cover the costs of reviews and inspections.

Engineering and compliance staff will invite the local building authority, Fresno County, or a third party engineering consultant, to act as CBO for the project. When an entity has been identified to perform the duties of CBO, Energy Commission staff will complete a Memorandum of Understanding (MOU) with that entity that outlines its roles and responsibilities and those of its subcontractors and delegates.

Staff has developed proposed Conditions of Certification to ensure public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities and qualifications of the applicant's engineers responsible for the design and construction of the project (proposed Conditions of Certification **GEN-1** through **GEN-8**). Engineers responsible for the design of the civil, structural, mechanical and electrical portions of the project are required to be registered in California, and to sign and stamp each submittal of design plans, calculations and specifications submitted to the CBO. These conditions require that no element of construction subject to CBO review and approval shall proceed without prior approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written to require that no element of construction of permanent facilities subject to CBO review and approval, which would be difficult to reverse or correct, may proceed without prior approval of plans by the CBO. Those elements of construction that are not difficult to reverse are allowed to proceed without approval of the plans. The applicant shall bear the responsibility to fully modify those elements of construction to comply with all design changes that result from the CBO's subsequent plan review and approval process.

FACILITY CLOSURE

The removal of a facility from service, or decommissioning, as a result of the project reaching the end of its useful life, may range from “mothballing” to removal of all equipment and appurtenant facilities and restoration of the site. Future conditions that may affect the decommissioning decision are largely unknown at this time.

In order to assure that decommissioning of the facility will be completed in a manner that is environmentally sound, safe and will protect public health and safety, the applicant shall submit a decommissioning plan to the Energy Commission for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of:

- proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
- all applicable LORS, local/regional plans and the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
- the activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
- decommissioning alternatives, other than complete site restoration.

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. Staff has proposed general conditions (see **General Conditions**) to ensure that these measures are included in the Facility Closure plan.

CONCLUSIONS

1. The laws, ordinances, regulations and standards (LORS) identified in the AFC and supporting documents are those applicable to the project.

2. Staff has evaluated the proposed engineering LORS, design criteria and design methods in the record, and concludes that the design, construction and eventual closure of the project are likely to comply with applicable engineering LORS.

3. The Conditions of Certification proposed will ensure that the proposed facilities are designed and constructed in accordance with applicable engineering LORS. This will occur through the use of design review, plan checking and field inspections, which are to be performed by the CBO or other Energy Commission delegate. Staff will audit the CBO to ensure satisfactory performance.

4. Whereas future conditions that may affect decommissioning are largely unknown at this time, it can reasonably be concluded that if the project owner submits a decommissioning plan as required in the **General Conditions** portion of this document prior to the commencement of decommissioning, the decommissioning procedure is likely to occur in compliance with all applicable engineering LORS.

Energy Commission staff recommends that:

1. The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to assure public health and safety, and to ensure compliance with all applicable engineering LORS;

2. The project be designed and built to the 2001 CBSC (or successor standard, if such is in effect when the initial project engineering designs are submitted for review); and

3. The CBO shall review the final designs, conduct plan checking and perform field inspections during construction. Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct and inspect the project in accordance with the 2001 California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations), which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval. (The CBSC in effect is that edition that has been adopted by the California Building Standards Commission and published at least 180 days previously.) The project owner shall insure that all the provisions of the above applicable codes be enforced during any construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility [2001 CBC, Section 101.3, Scope]. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

In the event that the initial engineering designs are submitted to the CBO when a successor to the 2001 CBSC is in effect, the 2001 CBSC 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.

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

Verification: Within 30 days after receipt of the Certificate of Occupancy, the project owner shall submit to the 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 [2001 CBC, Section 109 – Certificate of Occupancy].

Once the Certificate of Occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility which may require CBO approval for the purpose of complying with the above stated codes. The CPM will then determine the necessity of CBO approval on the work to be performed.

GEN-2 Prior to submittal of the initial engineering designs for CBO review, the project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List and a Master Specifications List. The schedule shall contain a list of proposed submittal packages of designs, calculations and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM when requested.

Verification: At least 60 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the schedule, the Master Drawing List and the Master Specifications List of documents to be submitted to the CBO for review and approval. These documents shall be the pertinent design documents for the major structures and equipment listed in **Facility Design Table 2** below. Major structures and equipment shall be added to or deleted from the table only with CPM approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Facility Design Table 2
Major Structures and Equipment List

Equipment/System	Quantity (Plant)
Combustion Turbine (CT) Foundation and Connections	4
CT Generator Foundation and Connections	4
SCR Stack Structure, Foundation and Connections	4
CT Exhaust Duct Structure, Foundation and Connections	4
CT Step-up Transformer Foundation and Connections	4
CT Auxiliary Skid Foundation and Connections	4
CT Inter Cooler System Structure, Foundation and Connections	4
CT Inlet Air Filter House Structure, Foundation and Connections	4
Packaged Electrical Electronic Control Center Structure, Foundation and Connections	4
Electrical Dew Point Heater Foundation and Connections	4
Pad Mounted Transformer Foundation and Connections	2
Generator Breaker Foundation and Connections	2
Auxiliary Transformer Foundation and Connections	2
Fuel Gas Compressor with Acoustical Enclosure Structure, Foundation and Connections	1
Natural Gas Surge Tank Structure, Foundation and Connections	1
Fuel Gas Re-circulating Area Foundation and Connections	1
Air Compressor Skid Foundation and Connections	1
Fuel Gas Compressor/Recycle Gas Fin Fan Cooler Foundation and Connections	1
CO Catalyst Structure, Foundation and Connections	4
Combustion Turbine VBV Silencer Stack Structure, Foundation and Connections	4
CEMS Equipment Structure, Foundation and Connections	4
Ammonia Vaporizer Foundation and Connections	4
Ammonia Storage Tank Foundation and Connections	1
Ammonia Forwarding Pump Skid Foundation and Connections	2
Ammonia Injection Skid Foundation and Connections	4
Gas Filter/Separator Skid Foundation and Connections	4
Cooling/Purge Air Fans Foundation and Connections	4
Cooling Tower Structure, Foundation and Connections	1
Cooling Tower Circulating Water Pump Foundation and Connections	2
Recycled Water Storage Tank Foundation and Connections	1
Warehouse Building Structure, Foundation and Connections	1
Water Treatment Building Structure, Foundation and Connections	1
Oil/Water Separator Foundation and Connections	1
Fire Water Pump Building Structure Foundation and Connections	1
Raw Water/Fire Water Storage Tank Structure, Foundation and Connections	1
Raw Water Pumps Foundation and Connections	2
Demineralized Water Storage Tank Structure, Foundation and Connections	1

Equipment/System	Quantity (Plant)
Demineralized Water Pumps Foundation and Connections	2
Wastewater Collection Tank Structure, Foundation and Connections	1
Wastewater Drains Tank Structure, Foundation and Connections	4
Wastewater Forwarding Pumps Foundation and Connections	2
Equipment Firewall Structure, Foundation and Connections	4
Electrical Building Structure, Foundation and Connections	2
Cooling Tower Transformers Foundation and Connections	2
Cooling Tower MCC and Chemical Feed Building Structure, Foundation and Connections	1
Dead End Structure Foundation and Connections	2
Control/Administration Building Structure Foundation and Connections	1
Storm Water Retention Pond	1
Drainage Systems (including sanitary drain and waste)	1 Lot
High Pressure and Large Diameter Piping and Pipe Racks	1 Lot
HVAC and Refrigeration Systems	1 Lot
Temperature Control and Ventilation Systems (including water and sewer connections)	1 Lot
Building Energy Conservation Systems	1 Lot
Switchyard, Buses and Towers	1 Lot
Electrical Duct Banks	1 Lot

GEN-3 The project owner shall make payments to the CBO for design review, plan check and construction inspection based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with the fees listed in the 2001 CBC [Chapter 1, Section 107 and Table 1-A, Building Permit Fees; Appendix Chapter 33, Section 3310 and Table A-33-A, Grading Plan Review Fees; and Table A-33-B, Grading Permit Fees], adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be as otherwise agreed by the project owner and the CBO.

Verification: The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project [Building Standards Administrative Code (Cal. Code Regs., tit. 24, § 4-209, Designation of Responsibilities)]. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be

delegated responsibility for mechanical and electrical portions of the project, respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

The RE shall:

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

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

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

4. Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;

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

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

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

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

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

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

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

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

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all responsible engineers assigned to the project [2001 CBC, Section 104.2, Powers and Duties of Building Official].

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A. The civil engineer shall:

1. Review the Foundation Investigations Report, Geotechnical Report or Soils Report prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;

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

underground utilities, culverts, site access roads and sanitary sewer systems; and

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

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

1. Review all the engineering geology reports;

2. Prepare the Foundation Investigations Report, Geotechnical Report or Soils Report containing field exploration reports, laboratory tests and engineering analysis detailing the nature and extent of the soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load [2001 CBC, Appendix Chapter 33, Section 3309.5, Soils Engineering Report; Section 3309.6, Engineering Geology Report; and Chapter 18, Section 1804, Foundation Investigations];

3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2001 CBC, Appendix Chapter 33; Section 3317, Grading Inspections (depending on the site conditions, this may be the responsibility of either the soils engineer or engineering geologist or both); and

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

This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations [2001 CBC, section 104.2.4, Stop orders].

C. The engineering geologist shall:

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

2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2001 CBC, Appendix Chapter 33; Section 3317, Grading Inspections (depending on the site conditions, this may be the responsibility of either the soils engineer or engineering geologist or both).

D. The design engineer shall:

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

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

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

4. Evaluate and recommend necessary changes in design; and

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

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

F. The electrical engineer shall:

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

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

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

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

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

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

GEN-6 Prior to the start of an activity requiring special inspection, 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 2001 CBC, Chapter 17 [Section 1701, Special Inspections; Section 1701.5, Type of Work (requiring special inspection)]; and Section 106.3.5, Inspection and observation program. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

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

The special inspector shall:

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

2. 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 [2001 CBC, Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]; and

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

Verification: At least 15 days (or project owner and CBO approved alternative timeframe) prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.

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

GEN-7 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend the corrective action required [2001 CBC, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special

Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this Condition of Certification and, if appropriate, the applicable sections of the CBC and/or other LORS.

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

GEN-8 The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. The project owner shall notify the CPM after obtaining the CBO's final approval. The project owner shall retain one set of approved engineering plans, specifications and calculations (including all approved changes) at the project site or at another accessible location during the operating life of the project [2001 CBC, Section 106.4.2, Retention of Plans]. Electronic copies of the approved plans, specifications, calculations and marked-up as-builts shall be provided to the CBO for retention by the CPM.

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

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

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

1. Design of the proposed drainage structures and the grading plan;

2. An erosion and sedimentation control plan;

3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and

4. Soils Report, Geotechnical Report or Foundation Investigations Report required by the 2001 CBC [Appendix Chapter 33, Section 3309.5, Soils Engineering Report; Section 3309.6, Engineering Geology Report; and Chapter 18, Section 1804, Foundation Investigations].

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

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer, geotechnical engineer, or the civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area [2001 CBC, Section 104.2.4, Stop orders].

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

CIVIL-3 The project owner shall perform inspections in accordance with the 2001 CBC, Chapter 1, Section 108, Inspections; Chapter 17, Section 1701.6, Continuous and Periodic Special Inspection; and Appendix Chapter 33, Section 3317, Grading Inspection. All plant site-grading operations, for which a grading permit is required, shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO and the CPM [2001 CBC, Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The project owner shall prepare a written report, with copies to the CBO and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

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

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage work, the project owner shall obtain the CBO's approval of the final grading plans (including final changes) for the erosion and sedimentation control work. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans [1998 CBC, Section 3318, Completion of Work].

Verification: Within 30 days (or project owner and CBO approved alternative timeframe) of the completion of the erosion and sediment control mitigation and

drainage work, the project owner shall submit to the CBO, for review and approval, the final grading plans (including final changes) and the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes, with a copy of the transmittal letter to the CPM. The project owner shall submit a copy of the CBO's approval to the CPM in the next Monthly Compliance Report.

STRUC-1 Prior to the start of any increment of construction of any major structure or component listed in **Facility Design Table 2** of Condition of Certification **GEN-2**, above, the project owner shall submit to the CBO for design review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for the following items (from **Table 2**, above):

1. Major project structures;

2. Major foundations, equipment supports and anchorage; and

3. Large field fabricated tanks.

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

The project owner shall:

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

2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations and specifications [2001 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 prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation [2001 CBC, Section 106.4.2, Retention of plans; and Section 106.3.2, Submittal documents];

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 [2001 CBC, Section 106.3.4, Architect or Engineer of Record]; and

5. Submit to the CBO the responsible design engineer's signed statement that the final design plans conform to the applicable LORS [2001 CBC, Section 106.3.4, Architect or Engineer of Record].

Verification: At least 60 days (or project owner and CBO approved alternative timeframe) prior to the start of any increment of construction of any structure or component listed in **Facility Design Table 2** of Condition of Certification **GEN-2** above, the project owner shall submit to the CBO the above final design plans, specifications and calculations, with a copy of the transmittal letter to the CPM.

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

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

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

2. Concrete pour sign-off sheets;

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

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

5. Reports covering other structural activities requiring special inspections shall be in accordance with the 2001 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 and the proposed corrective action to the CBO, with a copy of the transmittal letter to the CPM [2001 CBC, Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]. The NCR shall reference the Condition(s) of Certification and the applicable CBC chapter and section. Within five days of resolution

of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

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

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 2001 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 to the CBO prior notice of the intended filing.

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

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in Chapter 3, Table 3-E of the 2001 CBC shall, at a minimum, be designed to comply with the requirements of that Chapter.

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

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

MECH-1 The project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in **Facility Design Table 2**, Condition of Certification **GEN-2**, above. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of said construction [2001 CBC, Section 106.3.2, Submittal Documents; Section 108.3, Inspection Requests; Section 108.4, Approval Required; 2001 California Plumbing Code, Section 103.5.4, Inspection Request; Section 301.1.1, Approval].

The responsible mechanical engineer shall stamp and sign all plans, drawings and calculations for the major piping and plumbing systems subject to the CBO design review and approval, and submit a signed statement to the CBO when the said proposed piping and plumbing systems have been designed, fabricated and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards [Section 106.3.4, Architect or Engineer of Record], which may include, but not be limited to:

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

The CBO may deputize inspectors to carry out the functions of the code enforcement agency [2001 CBC, Section 104.2.2, Deputies].

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of any increment of major piping or plumbing construction listed in **Facility Design Table 2**, Condition of Certification **GEN-2** above, the project owner shall submit to the CBO for design review and approval the final plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

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

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation [2001 CBC, Section 108.3, Inspection Requests].

The project owner shall:

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

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

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

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

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

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS [2001 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record].

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

ELEC-1 Prior to the start of any increment of electrical construction for all electrical equipment and systems 480 volts and higher (see a representative list, below), with the exception of underground duct work and any physical layout

drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations [CBC 2001, Section 106.3.2, Submittal documents]. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [2001 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests]. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

A. Final plant design plans shall include:

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

2. system grounding drawings.

B. Final plant calculations must establish:

1. short-circuit ratings of plant equipment;

2. ampacity of feeder cables;

3. voltage drop in feeder cables;

4. system grounding requirements;

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

6. system grounding requirements; and

7. lighting energy calculations.

C. The following activities shall be reported to the CPM in the Monthly Compliance Report:

1. Receipt or delay of major electrical equipment;

2. Testing or energization of major electrical equipment; and

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

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with

the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

REFERENCES

PEC (Panoche Energy Center Project) 2006a – Application for Certification. Submitted to the California Energy Commission on August 2, 2006.

GEOLOGY AND PALEONTOLOGY

Patrick Pilling, Ph.D., P.E., G.E.

SUMMARY OF CONCLUSIONS

Strong ground shaking during an earthquake, potential dynamic compaction, potential differential settlement of heavily loaded structures, and moderately expansive soils represent the primary potential geologic hazards at the Panoche Energy Center (PEC) site. The effects of strong ground shaking, dynamic compaction, and potential differential settlement of heavily loaded structures must be mitigated through structural design as required by the California Building Code (2001) and as recommended in the project geotechnical report (PEC, 2006a), and moderately expansive clay soils should be mitigated based on the recommendations in the project geotechnical report (PEC, 2006a). There are no known viable geologic or mineralogical resources. Paleontological resources have been documented in the general area of the project, though no significant fossils were found during field explorations in the immediate vicinity. The potential impacts to paleontological resources due to construction activities will be mitigated as required by the Conditions of Certification.

Based on this information, it is staff's opinion that the potential for significant adverse cumulative impacts to the project from geologic hazards, and to potential geologic, mineralogic, and paleontologic resources from the construction, operation, and closure of the proposed project, is low. It is Energy Commission staff's opinion that the PEC can be designed and constructed in accordance with all applicable laws, ordinances, regulations, and standards (LORS), and in a manner that protects environmental quality and assures public safety.

INTRODUCTION

In this section, Energy Commission staff discusses potential impacts of the proposed PEC regarding geologic hazards, geologic (including mineralogic), and paleontologic resources. Staff's objective is to ensure that there will be no significant adverse impacts to significant geological and paleontological resources during project construction, operation, and closure. A brief geological and paleontological overview is provided. The section concludes with staff's proposed monitoring and mitigation measures with respect to geologic hazards and geologic, mineralogic, and palentologic resources, with the inclusion of Conditions of Certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The applicable LORS are listed in the Application for Certification (AFC) (PEC, 2006a). The following is a brief description of the current LORS for geologic hazards and resources and mineralogic and paleontologic resources.

GEOLOGY AND PALENTOLOGY Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal:	The proposed PEC is not located on federal land. There are no federal LORS for geologic hazards and resources for this site.
State:	
Division 15 of the Public Resources Code, Section 25527	The Warren-Alquist Act requires the California Energy Commission (CEC) to "give the greatest consideration to the need for protecting areas of critical environmental concern, including, but not limited to, unique and irreplaceable scientific, scenic, and educational wildlife habitats; unique historical archaeological, and cultural site…" With respect to paleontologic resources, the CEC relies on the following guidelines from the Society for Vertebrate Paleontology (SVP).
Society for Vertebrate Paleontology (SVP), 1995	The "Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontological Resources: Standard Procedures" is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. The measures were adopted in October 1995 by the Society for Vertebrate Paleontology, a national organization of professional scientists.
California Building Standards Code (CBSC), 2001 (Particularly, Part 2, California Building Code (CBC)	The CBC includes a series of standards that are used in project investigation, design, and construction (including grading and erosion control)
Local:	None

SETTING

The proposed PEC site is a 12.8-acre site within a 120-acre parcel in western Fresno County, California. The site is located on the south side of West Panoche Road, approximately 2 miles east of the intersection of West Panoche Road with Interstate Highway 5. The site is presently occupied by a pomegranate orchard. The proposed project is to consist of four, natural-gas-fired turbine generators producing a total of 400 MW. Ancillary facilities include a 300-foot electrical transmission line to the Panoche Substation to the northeast; 400-foot access road south of West Panoche Road to the plant site; a 2,400-foot new gas pipeline; and expansion of the existing Panoche Substation by approximately 1.1 acres to the south.

REGIONAL SETTING

The PEC site is located in the western San Joaquin Valley, which is part of the Central Valley. The Central Valley is bounded on the north by low-lying hills; on the northeast by a volcanic plateau of the Cascade Range; on the west by the Coast Ranges; on the east by the Sierra Nevada; and on the south by the Coast Ranges and the Tehachapi Mountains. The northern one-third of the valley is known as the Sacramento Valley, while the southern two-thirds is known as the San Joaquin Valley. The Central Valley is characterized by dissected uplands, low alluvial plains and fans, river flood plains and channels, and overflow lands and lake bottoms. The Central Valley represents the alluvial, flood, and delta plains of the Sacramento River and the San Joaquin River, and their tributaries. In the late Cenozoic era, much of the San Joaquin Valley was occupied by shallow brackish and freshwater lakes. Lake Corcoran previously covered most of the northern San Joaquin Valley during the middle to late Pleistocene era, and an associated diatomaceous-lacustrine clay covers more than 5,000 square miles of the San Joaquin Valley (Norris and Webb, 1990).

The oldest rocks in the area are basement complex rocks that form much of the Tehachapi Mountains, San Emigdio Mountains, and the southern Sierra Nevada which are comprised of a mass of plutonic and metamorphic rocks. The basement complex is buried beneath the Tulare Lake bed by more than 14,000 feet of rocks of Cretaceous, Tertiary, and Quaternary age. Marine rocks of Jurassic and Cretaceous age also underlie the site at great depth below the valley floor. Younger consolidated marine and nonmarine sedimentary rocks of Tertiary age unconformably overlie the older marine rocks, and locally this section includes the Laguna Seca and the Lodo formations of Eocene and Paleocene age. The unconformably overlying Oro Loma formation is of Pliocene and Miocene age (Bartow, 1996; Bartow and Lettis, 1990). The Tulare formation of late Pliocene and early Pleistocene age uncomformably overlies the Oro Loma formation (Bartow and Lettis, 1990), and is estimated to be in excess of 600 feet in thickness beneath the site.

The Tulare formation is locally divided into a lower unit, the Corcoran Clay Member of the upper unit, and the upper unit. The thicknesses of these units is estimated to be greater than 275 feet, 130 feet, and 190 feet, respectively immediately southeast of the site (Lettis, 1982). The Corcoran Clay Member is significant since it divides the ground water flow system into a lower confined zone and an upper semi confined zone. This material is often referred to as “blue clay.”

The Tulare formation is overlain by alluvium of the Panoche fan, sediment derived from older rocks shed eastward from the Diablo Range towards the valley trough. These sediments were deposited during relatively short-lived water flow and infrequent mudflow events by depositional processes including debris flows, sheet floods, stream channel deposits, and sieve deposits. As a result, Panoche fan sediments generally consist of complexly interbedded lenses of gravels, sands, silts, and clay.

The depth to ground water in the upper semi confined zone in this area is estimated to be on the order of 200 feet below existing grade (PEC, 2006a).

PROJECT SITE DESCRIPTION

The site is generally underlain by alluvium of the Panoche fan, which consists of poorly to moderately sorted, subangular to subrounded gravels, sands, silts, and clays complexly interbedded in lenses of varying thickness (PEC, 2006a). The site is located within an area mapped as Quaternary age alluvium composed of clay and sand.

Exploration at the site (PEC, 2006a) extended to a maximum depth of 65 feet below existing grade and encountered a thin surficial layer of artificial fill overlying recent alluvium characterized by complexly interbedded lenses of sands with varying silt content, silts, and clays. The sand soils were generally classified as slightly moist to moist, and very loose to medium dense. The silts and clays were generally classified as moist and medium stiff to very stiff.

Ground water was not encountered to the depths explored (65 feet).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

There are two types of impacts considered in this section. The first are geologic hazards, which could impact proper functioning of the proposed facility. The second considers potential impacts the proposed facility could have on existing geologic, mineralogic, and paleontologic resources in the area.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

No federal LORS with respect to geologic hazards and geologic and mineralogic resources apply to this project. The CBSC and CBC (2001) provide geotechnical and geological investigation and design guidelines, which engineers must adhere to when designing a proposed facility. As a result, the criteria used to assess geologic hazard impact significance includes evaluating each potential hazard in relation to being able to adequately design and construct the proposed facility. Geologic hazards to be considered include faulting and seismicity, liquefaction, dynamic compaction, hydrocompaction, subsidence, expansive soils, landslides, tsunamis and seiches.

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 geologic hazards.
- Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

With respect to impacts the proposed facility may have on existing geologic and mineralogic resources, geologic and mineral resource maps for the surrounding area have been reviewed, in addition to any site-specific information provided by the applicant, to determine if geologic and mineralogic resources are present in the area. When available, operating procedures of the proposed facility, in particular ground water

extraction and mass grading, are reviewed to determine if such operations could adversely impact such resources.

Staff reviewed existing paleontologic information for the surrounding area, as well as site-specific information generated by the applicant for the PEC. All research was conducted in accordance with accepted assessment protocol (SVP 1995) to determine if there are any known paleontologic resources in the general area. If present or likely to exist, Conditions of Certification are applied to the project approval, which outlines procedures required during construction to mitigate impacts to potential resources.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Ground shaking and dynamic compaction during an earthquake, differential settlement of heavily loaded structures, and moderately expansive clay soils represent the only known geologic hazards at this site. The potential hazards can be effectively mitigated through facility design by incorporating the recommendations contained in the project geotechnical report (PEC, 2006a). Conditions of Certification **GEN-1, GEN-5, and CIVIL-1** in the **Facility Design** section should mitigate these impacts to a less than significant level.

No viable geologic or mineralogic resources are known to exist in the area. Although no paleontological resources have been documented at the site, paleontological resources have been documented in the area (PEC, 2006a). As a result, paleontological resources may be present in the alluvial soils that underlie the site such that these materials are highly sensitive to construction activities. Since the proposed PEC will include significant amounts of grading, foundation excavation, and utility trenching, staff considers the probability that paleontological resources will be encountered during such activities to be high. This assessment is based on SVP criteria and the confidential paleontological report appended to the AFC (PEC, 2006a). Conditions of Certification **PAL-1** to **PAL-7** are designed to mitigate any paleontological resource impacts, as discussed above, to a less than significant level.

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 geologic hazards, and to protection of geologic, mineralogic, and paleontologic resources.

Based on the information below, it is staff's opinion that the potential for significant adverse cumulative impacts to the project from geologic hazards, and to potential geologic, mineralogic, and paleontologic resources from the proposed project, is very low.

GEOLOGICAL HAZARDS

The AFC (PEC, 2006a) provides documentation of potential geologic hazards at the PEC plant site, in addition to subsurface exploration information. Review of the AFC, coupled with our independent research, indicates that the potential for geologic hazards to impact the plant site is low.

Our independent research included review of available geologic maps, reports, and related data of the PEC plant site. Geological information was available from the

California Geological Survey (CGS), California Division of Mines and Geology (CDMG), and other governmental organizations.

Faulting and Seismicity

Energy Commission staff reviewed the CGS publication *Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions*, dated 1994 (CGS. 1994); the *Simplified Fault Activity Map of California* (Jennings and Saucedo. 2002); the *Maps of Known Active Fault Near-Source Zones in California and Adjacent Parts of Nevada* (International Conference of Building Officials [ICBO], 1998); *Probabilistic Seismic Hazard Assessment for the State of California* (CDMG. 1996a); and *Peak Acceleration from Maximum Credible Earthquakes in California (Rock and Stiff Soil Sites)* (CDMG. 1992). Energy Commission staff did not observe any surface faulting during its site visit. No active or potentially active faults are known to cross the power plant footprint or its associated linear facilities.

The closest known active fault is the Ortigalita fault zone (a dextral strike-slip fault) which is located 31.2 kilometers (km) (19.4 miles) from the site at its closest point. The next closest known active fault is the San Andreas fault (a dextral strike-slip fault) which is located 45.4 km (28.2 miles) west of the proposed energy facility. The Nunez fault is located approximately 48.3 km (30 miles) from the site at its closest point. The closest Great Valley thrust fault is located approximately 8.5 km (5.3 miles) from the site at its closest point; however, the Great Valley thrust faults are not considered Earthquake Fault Zones as defined by the Alquist-Priolo Earthquake Fault Zoning Act of 1994.

The estimated peak horizontal ground acceleration for the power plant is 0.48g based on 10 percent probability of exceedence in 50 years (PEC, 2006a).

The potential of surface rupture on a fault at the energy facility footprint is considered to be very low, since no faults are known to have ruptured the ground surface of the proposed energy facility location.

Liquefaction

Liquefaction is a condition in which a cohesionless soil may lose shear strength due to a sudden increase in pore water pressure. Because the depth to ground water at the site is much greater than 50 feet below existing grade, the potential for liquefaction at the power plant site is negligible.

Dynamic Compaction

Dynamic compaction of soils results when relatively unconsolidated granular materials experience vibration associated with seismic events. The vibration causes a decrease in soil volume, as the soil grains tend to rearrange into a more dense state (an increase is soil density). The decrease in volume can result in settlement of overlying structural improvements.

The site is underlain by lenses of very loose to loose granular soils that exhibit a potential for dynamic compaction during strong seismic events; however, heavily-loaded structures that are settlement sensitive will be founded on deep foundations. As a result, the potential for dynamic compaction to affect operation of the facility is considered low.

Hydrocompaction

Hydrocompaction is the process of the loss of soil volume upon the application of water. Although soils in the region are known to exhibit hydrocompaction potential, the site has been irrigated for agricultural use for many years which minimizes the potential of near-surface hydrocompaction. In addition, heavily-loaded structures that are settlement sensitive will be founded on deep foundations. As a result, the potential for hydrocompaction to affect operation of the facility is considered low.

Subsidence

Ground subsidence is typically caused by petroleum or ground water withdrawal such that the effective unit weight of the soil profile is increased, which increases the effective stress on the deeper soils. This results in consolidation/settlement of the underlying soils.

This area has experienced significant historic subsidence due to ground water withdrawal for agricultural use. Recently, ground subsidence due to ground water withdrawal has decreased substantially due to an increased reliance on surface water, microirrigation techniques, and land retirement such that significant subsidence due to surrounding ground water withdrawal is not anticipated.

Although the applicant is proposing to pump ground water, the affected aquifer is relatively deep and waste water will be disposed of using deep well injection. As a result, staff has determined that there is no significant potential for subsidence due to ground water withdrawal at the proposed PEC.

Expansive Soils

Soil expansion occurs when clay-rich soils, with an affinity for water, exist in-place at a moisture content below their plastic limit. The addition of moisture from irrigation, capillary tension, water line breaks, etc., causes the clay soils to collect water molecules in their structure, which in turn causes an increase in the overall volume of the soil. This increase in volume can correspond to movement of overlying structural improvements. Clays of medium to high plasticity are present within the upper 10 feet of soil at the site, and these soils will exhibit some shrink-swell behavior. Mitigation of expansive soil, by over-excavation and replacement of these materials under the proposed structures, or by founded structures of deep foundations, is recommended in the project geotechnical report and considered appropriate.

Landslides

Landslide potential at the PEC site is negligible since the proposed energy facility is located on a broad, gently sloping (0.5 percent to the northeast) alluvial fan.

Flooding

The PEC lies on a very gently sloping alluvium plain, and drainage of the site is accomplished by overland sheet flow. A shallow unlined ditch is present immediately north of the site, and has been included in a special flood hazard area (Zone A) that can be inundated by a 100-year flood with no base flood elevation determined (Federal Emergency Management Agency [FEMA], 2001). The balance of the project area is

located outside the 500-year flood plain. The potential for flooding can be effectively mitigated by establishing finish grade above any flood elevation as required by facility design. Therefore, the potential for flooding to affect operation of the plant is considered low.

Tsunamis and Seiches

The proposed PEC site is not near any large body of water. As a result, the potential for tsunamis to affect the operation of the facility is considered negligible. There is also no potential for a seiche wave to impact the operation of the facility.

Construction Impacts and Mitigation

Clay soils, which exhibit the potential to consolidate when subjected to loading and expand/contract when subjected to moisture content fluctuations, are present at the site and must be addressed during design and construction (See **Conditions of Certification, Facility Design**).

Operation Impacts and Mitigation

Potential geologic hazards, including strong ground shaking and dynamic compaction, can be effectively mitigated through facility design (See **Conditions of Certification, Facility Design**) such that these potential hazards should not affect operation of the facility.

GEOLOGIC, MINERALOGIC, AND PALEONTOLOGIC RESOURCES

Energy Commission staff has reviewed applicable geologic maps and reports for this area (*California Department of Conservation, 2001; CDMG, 1990; CDMG, 1999; CGS, 2002)*. Based on this review and the information contained in the AFC (PEC, 2006a), there are no known viable geologic or mineralogic resources located at or immediately adjacent to the proposed PEC site. The southern extent of the Chaney Ranch gas field is located approximately ½ mile north of the plant site; however, the last production from this field was in 1951 and the field was officially abandoned in 1964.

A paleontologic resources field survey has been performed for the entire project and the area surrounding it. The results of this study indicate that excavations in the underlying native soils, in particular the Los Banos alluvium and the San Luis Ranch alluvium, could disturb fossiliferous sediments such that adverse impacts on significant paleontological resources could be experienced. In addition, fossil plant fragments were located approximately 3 miles north-northwest of the site, and rodent bones and charcoalified wood were identified approximately 1.85 miles northwest of the site (PEC, 2006a).

Based on this information and staff's review of available information, the proposed PEC site has a high potential to contain significant paleontological resources when native materials are encountered during grading, foundation, and trenching activities.

Construction Impacts and Mitigation

As noted above, no viable geologic or mineralogic resources are known to exist in the area. Paleontological resources have been documented within 3 miles of the project

site. Potential impacts to paleontologic resources would include, but not be limited to, disturbing the natural depositional state of the resource that would prevent proper chronological inventory, in addition to damaging (i.e. crushing, cracking, and/or fragmentation) the resource itself. Conditions of Certification **PAL-1** to **PAL-7** are appropriate for excavation activities in native ground and are designed to mitigate any paleontological resource impacts, as discussed above, to a less than significant level.

Operation Impacts and Mitigation

Operation of the proposed plant facilities should not have any adverse impact on geologic, mineralogic, or paleontologic resources. Potential geologic hazards, including strong ground shaking and dynamic compaction, can be effectively mitigated through facility design (See **Conditions of Certification, Facility Design**) such that these potential hazards should not affect operation of the facility.

CUMULATIVE IMPACTS AND MITIGATION

Strong ground shaking during an earthquake, potential dynamic compaction, potential differential settlement of heavily loaded structures, and moderately expansive soils represent the primary potential geologic hazards at the PEC site. No known viable geologic or mineralogic resources are present. Strong ground shaking, potential dynamic compaction, potential settlement of heavily loaded structures, and expansive clay soils must be mitigated through foundation design as required by the CBC (2001), the project geotechnical report and **Conditions of Certification GEN-1, GEN-5, and CIVIL-1** under **Facility Design**. Paleontological resources have been documented approximately 1.85 and 3 miles northwest of the project site. The potential impacts to paleontological resources due to construction activities will be mitigated as required by **Conditions of Certification PAL-1 to PAL-7**.

Based on this information, it is staff's opinion that the potential for significant adverse cumulative impacts to the project from geologic hazards, and to potential geologic, mineralogic, and paleontologic resources from the proposed project, is low.

Based upon the literature and archives search, field surveys and compliance documentation for the PEC project, the applicant has proposed monitoring and mitigation measures to be followed during the construction of the PEC. Energy Commission staff agree with the applicant that the facility can be designed and constructed to minimize the effect of geologic hazards at the site, and that impacts to vertebrate fossils encountered during construction of the power plant and associated linear facilities would be mitigated to a level of insignificance.

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 geologic hazards, and geologic, mineralogic, and paleontologic resources.

FACILITY CLOSURE

A definition and general approach to closure is presented in the General Conditions section of this assessment. Facility closure activities are not anticipated to impact geologic, mineralogic, or paleontologic resources. This is due to the fact that no such

resources are known to exist at the power plant location or along its proposed linears. In addition, decommissioning and closure of the power plant should not negatively affect geologic, mineralogic, or paleontologic resources since the majority of the ground disturbed in plant decommissioning and closure would have been disturbed during construction and operation of the facility.

CONCLUSIONS

The applicant will likely be able to comply with applicable LORS, provided that the proposed Conditions of Certification are followed. The project should have no adverse impact with respect to design and construction of the project, and geologic, mineralogic, and paleontologic resources. Staff proposes to ensure compliance with applicable LORS through the adoption of the proposed Conditions of Certification listed below.

PROPOSED CONDITIONS OF CERTIFICATION

General Conditions of Certification with respect to Geology are covered under Conditions of Certification **GEN-1, GEN-5, and CIVIL-1** in the **Facility Design** section. Paleontological Conditions of Certification follow.

PAL-1 The project owner shall provide the Compliance Project Manager (CPM) with the resume and qualifications of its Paleontological Resource Specialist (PRS) for review and approval. If the approved PRS is replaced prior to completion of project mitigation and submittal of the Paleontological Resources Report, the project owner shall obtain CPM approval of the replacement PRS. The project owner shall submit to the CPM to keep on file, resumes of the qualified Paleontological Resource Monitors (PRMs). If a PRM is replaced, the resume of the replacement PRM shall also be provided to the CPM.

The PRS resume shall include the names and phone numbers of references. The resume shall also demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontology (SVP) guidelines of 1995. The experience of the PRS shall include the following:

1. institutional affiliations, appropriate credentials and college degree,
2. ability to recognize and collect fossils in the field;
3. local geological and biostratigraphic expertise;
4. proficiency in identifying vertebrate and invertebrate fossils and;

5. at least three years of paleontological resource mitigation and field experience in California, and at least one year of experience leading paleontological resource mitigation and field activities.

The project owner shall ensure that the PRS obtains qualified paleontological resource monitors to monitor as he or she deems necessary on the project. Paleontologic resource monitors (PRMs) shall have the equivalent of the following qualifications:

- BS or BA degree in geology or paleontology and one year experience monitoring in California; or
- AS or AA in geology, paleontology or biology and four years experience monitoring in California; or
- Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

Verification:

1. At least 60 days prior to the start of ground disturbance, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.

2. At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project and stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM. The letter shall be provided to the CPM no later than one week prior to the monitor beginning on-site duties.

3. Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

PAL-2 The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant, construction laydown areas, and all related facilities. Maps shall identify all areas of the project where ground disturbance to greater than 5 feet depth is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and the plan and profile drawings for the utility lines would be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and can be at a scale of 1 inch = 40 feet to 1 inch = 100 feet range. If the footprint of the power plant or linear facility changes, the project owner shall provide maps and drawings reflecting these changes to the PRS and CPM.

If construction of the project will proceed in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Prior

to work commencing on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent or construction field manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

Verification:

1. At least 30 days prior to the start of ground disturbance, the project owner shall provide the maps and drawings to the PRS and CPM.

2. If there are changes to the footprint of the project, revised maps and drawings shall be provided to the PRS and CPM at least 15 days prior to the start of ground disturbance.

3. If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within 5 days of identifying the changes.

PAL-3 The project owner shall ensure that the PRS prepares, and the project owner submits to the CPM for review and approval, a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting and sampling activities and may be modified with CPM approval. This document shall be used as a basis for discussion in the event that on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of Vertebrate Paleontology (SVP, 1995) and shall include, but not be limited to, the following:

1. Assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking, construction monitoring, mapping and data recovery, fossil preparation and collection, identification and inventory, preparation of final reports, and transmittal of materials for curation will be performed according to the PRMMP procedures;

2. Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and the Conditions of Certification;

3. A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;

4. An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained units;

5. A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed plan for the monitoring and sampling;

6. A discussion of the procedures to be followed in the event of a significant fossil discovery, halting construction, resuming construction, and how notifications will be performed;

7. A discussion of equipment and supplies necessary for collection of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;

8. Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontology standards and requirements for the curation of paleontological resources;

9. Identification of the institution that has agreed to receive any data and fossil materials collected, requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution; and

10. A copy of the paleontological Conditions of Certification.

Verification: At least 30 days prior to ground disturbance, the project owner shall provide a copy of the PRMMP to the CPM. The PRMMP shall include an affidavit of authorship by the PRS, and acceptance of the PRMMP by the project owner evidenced by a signature.

PAL-4 Prior to ground disturbance and for the duration of construction, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for all recently employed project managers, construction supervisors and workers who are involved with or operate ground disturbing equipment or tools. Workers shall not excavate in sensitive units prior to receiving CPM-approved worker training. Worker training shall consist of an initial in-person PRS training during the project kick-off for those mentioned above. Following initial training, a CPM-approved video or in-person training may be used for new employees. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern. No ground disturbance shall occur prior to CPM approval of the WEAP, unless specifically approved by the CPM.

The Worker Environmental Awareness Program (WEAP) shall address the potential to encounter paleontological resources in the field, the sensitivity

and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall include:

1. A discussion of applicable laws and penalties under the law;

2. Good quality photographs or physical examples of vertebrate fossils shall be provided for project sites containing units of high paleontologic sensitivity;

3. Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;

4. Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;

5. An informational brochure that identifies reporting procedures in the event of a discovery;

6. A Certification of Completion of WEAP form signed by each worker indicating that they have received the training; and

7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification:

1. At least 30 days prior to ground disturbance, the project owner shall submit the proposed WEAP including the brochure with the set of reporting procedures the workers are to follow.

2. At least 30 days prior to ground disturbance, the project owner shall submit the script and final video to the CPM for approval if the project owner is planning on using a video for interim training.

3. If the owner requests an alternate paleontological trainer, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval prior to installation of an alternate trainer. Alternate trainers shall not conduct training prior to CPM authorization.

4. In the Monthly Compliance Report (MCR) the project owner shall provide copies of the WEAP Certification of Completion forms with the names of those trained and the trainer or type of training (in-person or video) offered that month. The MCR shall also include a running total of all persons who have completed the training to date.

PAL-5 The project owner shall ensure that the PRS and PRM(s) monitor consistent with the PRMMP all construction-related grading, excavation, trenching, and augering in areas where potentially fossil-bearing materials have been identified, both at the site and along any constructed linear facilities associated with the project. In the event that the PRS determines full time

monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the project owner shall notify and seek the concurrence of the CPM.

The project owner shall ensure that the PRS and PRM(s) have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1. Any change of monitoring different from the accepted schedule presented in the PRMMP shall be proposed in a letter or email from the PRS and the project owner to the CPM prior to the change in monitoring and included in the Monthly Compliance Report. The letter or email shall include the justification for the change in monitoring and be submitted to the CPM for review and approval.

2. The project owner shall ensure that the PRM(s) keeps a daily log of monitoring of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.

3. The project owner shall ensure that the PRS immediately notifies the CPM within 24 hours of the occurrence of any incidents of non-compliance with any paleontological resources Conditions of Certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the Conditions of Certification.

4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM within 24 hours or Monday morning in the case of a weekend when construction has been halted due to a paleontological find.

The project owner shall ensure that the PRS prepares a summary of the monitoring and other paleontological activities that will be placed in the Monthly Compliance Reports (MCR). The summary will include the name(s) of PRS or PRM(s) active during the month, general descriptions of training and monitored construction activities and general locations of excavations, grading, etc. A section of the report shall include the geologic units or subunits encountered; descriptions of sampling within each unit; and a list of identified fossils. A final section of the report will address any issues or concerns about the project relating to paleontologic monitoring including any incidents of non-compliance and any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the report shall include an explanation in the summary as to why monitoring was not conducted.

Verification: The project owner shall ensure that the PRS submits the summary of monitoring and paleontological activities in the MCR. When feasible, the CPM shall be notified 10 days in advance of any proposed changes in monitoring different from the

plan identified in the PRMMP. If there is any unforeseen change in monitoring, the notice shall be given as soon as possible prior to implementation of the change.

PAL-6 The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed including collection of fossil materials, preparation of fossil materials for analysis, analysis of fossils, identification and inventory of fossils, the preparation of fossils for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the project construction.

Verification: The project owner shall maintain in their compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resource Report (See **PAL-7**). The project owner shall be responsible to pay any curation fees charged by the museum for fossils collected and curated as a result of paleontological mitigation. A copy of the letter of transmittal submitting the fossils to the curating institution shall be provided to the CPM.

PAL-7 The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information and submitted to the CPM for review and approval.

The report shall include, but is not limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated below the level of significance.

Verification: Within 90 days after completion of ground disturbing activities, including landscaping, the project owner shall submit the Paleontological Resources Report under confidential cover to the CPM.

Certification of Completion
Worker Environmental Awareness Program
Panoche Energy Project (06-AFC-5)

This is to certify these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on Cultural, Paleontology and Biological Resources for all personnel (i.e., construction supervisors, crews and plant operators) working on-site or at related facilities. By signing below, the participant indicates that they understand and shall abide by the guidelines set forth in the Program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
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25.			

Cultural Trainer	***Signature***	**Date**
Paleontology Trainer	***Signature***	**Date**
Biological Trainer	***Signature***	**Date**

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POWER PLANT EFFICIENCY

Steve Baker

SUMMARY OF CONCLUSIONS

The project, if constructed and operated as proposed, would generate a nominal 400 MW of peaking electric power at an overall project fuel efficiency of 40.7 percent lower heating value (LHV) at maximum full load. 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 project would present no significant adverse impacts upon energy resources.

INTRODUCTION

The Energy Commission makes findings as to whether energy use by the Panoche Energy Center Project (PEC) 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 PEC's consumption of energy would create 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:

- examine whether the facility will likely present any adverse impacts upon energy resources;
- examine whether these adverse impacts are significant; and if so,
- examine whether feasible mitigation measures exist that would eliminate the adverse impacts, or reduce them to a level of insignificance.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

No Federal, State or local/county laws, ordinances, regulations and standards (LORS) apply to the efficiency of this project.

SETTING

Panoche Energy Center, LLC (PEC) proposes to construct and operate the 400 MW (nominal net output) simple cycle PEC, providing flexible peaking and intermediate power and ancillary services to Pacific Gas and Electric Company (PG&E) as dispatched by PG&E (PEC 2006a, AFC §§ 1.1, 1.2.2, 3.4.1, 3.9.2.1, 3.11.4). The project will consist of four General Electric (GE) LMS100 gas turbine generators and ancillary equipment. The applicant intends for the project to operate at an annual capacity factor up to 57 percent (PEC 2006a, AFC §§ 1.2.2, 3.4.1, 3.4.4.2, 3.11.4). The gas turbines will be equipped with evaporative inlet air cooling and compressor intercooling (via a

five-cell evaporative cooling tower) to enhance power, as well as combustor water injection and selective catalytic reduction (SCR) to control oxides of nitrogen emissions and a combustion catalyst to control carbon monoxide (PEC 2006a, AFC §§ 1.1, 1.2.2, 3.4.1, 3.4.4.1, 3.9.2.1.2, 3.11.6).

The project will be constructed on a site currently in agricultural use adjacent to PG&E's Panoche substation in unincorporated western Fresno County. The site has access to electric transmission and ground water wells (PEC 2006a, AFC §§ 1.1, 1.2.1, 3.2).

ASSESSMENT OF IMPACTS

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE OF ENERGY RESOURCES

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).

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. Under average ambient conditions, the PEC would burn natural gas at a nominal rate of 3,220 million Btu[1] per hour LHV (PEC 2006a, AFC §§ 1.2.3, 3.4.4.2, 3.4.6; Figs. 3.4-4, 3.4-5, 3.4-6). 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 full load efficiency of approximately 40.7 percent LHV (PEC 2006a, AFC §§ 3.4.4.2, 3.11.6; Figs. 3.4-4, 3.4-5, 3.4-6).

[1] British thermal units.

ADVERSE EFFECTS ON ENERGY SUPPLIES AND RESOURCES

The applicant has described its sources of supply of natural gas for the project (PEC 2006a, AFC §§ 1.2.1, 3.2, 3.4.6, 3.7.1, 3.9.4, 3.11.7.1). Natural gas for the PEC will be supplied from the existing PG&E Line 2 natural gas trunk line north of the project site. The PG&E natural gas system has access to gas from the Rocky Mountains, Canada and the Southwest. This represents a resource of considerable capacity, an adequate source for a project of this size. It is therefore highly unlikely that the project could pose a significant adverse impact on natural gas supplies in California.

Power plants are high value gas consumers. Should gas supplies or gas transport capacity fall short, power plants would not be curtailed until after most or all industrial and commercial users had been curtailed. Given PG&E's extensive system, staff does not envision the project suffering significant risk of gas supply curtailment.

ADDITIONAL ENERGY SUPPLY REQUIREMENTS

Natural gas fuel will be supplied to the project from the existing PG&E Line 2 via a new 16-inch diameter, 2,400 foot-long interconnection (PEC 2006a, AFC §§ 3.2, 3.4.6, 3.11.7.1). This is a resource with adequate delivery capacity for a project of this size. There is no real likelihood that the PEC will require the development of additional energy supply capacity.

COMPLIANCE WITH ENERGY STANDARDS

No standards apply to the efficiency of the PEC or other non-cogeneration projects.

ALTERNATIVES TO REDUCE WASTEFUL, INEFFICIENT AND UNNECESSARY ENERGY CONSUMPTION

The PEC 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 project objective is to provide flexible peaking and intermediate power and ancillary services, such as automatic generation control, during periods of high demand (typically hot summer days) as dispatched by PG&E (PEC 2006a, AFC §§ 1.1, 1.2.2, 3.4.1, 3.9.2.1, 3.11.4). A simple-cycle configuration is consistent with this objective. The PEC will be configured as four simple cycle power plants in parallel, in which electricity is generated by four natural gas-fired turbine generators (PEC 2006a, AFC §§ 1.1, 1.2.2, 3.1, 3.4.1). This configuration, with its short start-up time and fast ramping[2] capability, is well suited to providing peaking power. Further, when reduced output is required, one or more turbine generators can be shut down, allowing the remaining machine(s) to

[2] Ramping is increasing and decreasing electrical output to meet fluctuating load requirements.

produce a percentage of the full power at optimum efficiency, rather than operating a single, larger machine at a less efficient part load output.

The applicant intends for this facility to operate in peaking duty at an annual capacity factor up to 57 percent for the four combustion turbines (PEC 2006a, AFC §§ 1.2.2, 3.4.1, 3.4.4.2, 3.11.4). This is equivalent to each machine running no more than 5,000 hours per year.

Equipment Selection

Modern gas turbines embody the most fuel-efficient electric generating technology available today. The PEC will employ three GE LMS100 gas turbine generators, the newest and most efficient such machine available (PEC 2006a, AFC §§ 1.1, 1.2.2, 3.1, 3.4.1, 3.4.4.2, 3.4.6; Figs. 3.4-4, 3.4-5, 3.4-6). This model of the LMS100[3] is nominally rated at 98.8 MW at a fuel efficiency of 45.1 percent (GTW 2006). The PEC will actually produce 400.2 MW (100.05 MW per machine) at a site rated fuel efficiency of 40.7 percent LHV, based on average annual weather conditions (63.3°F) (PEC 2006a, AFC Figure 3.4-5). This site rating differs from nominal figures due to site specific ambient conditions (altitude and temperature), power losses from parasitic loads, and reduced system output due to flow losses caused by the inlet air cooling system and the SCR unit installed on the exhaust of each turbine.

Efficiency of Alternatives to the Project

Alternative Generating Technologies

Alternative generating technologies for the PEC are considered in the AFC (PEC 2006a, AFC §§ 2.3, 4.3, 4.4). Fossil fuels (coal and oil), nuclear, geothermal, biomass and solar power were all considered. Solar is not dispatchable, so is incapable of producing the ancillary services[4] needed. Coal and oil are too highly polluting to be viable in California. Geothermal is not available at the PEC site, and biomass presents problems with availability. Staff agrees with the applicant that only natural gas-burning technologies are feasible for this project.

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. Current progress in the development of gas turbines, incorporating technological advances made in the development of aircraft (jet) engines, combined with the cost advantages of assembly-

[3] The PEC will employ LMS100PA machines with single annular combustors equipped with water injection for NOx control.

[4] PEC proposes to offer peaking and intermediate power service, including flexible output (from 50 to 400 MW), rapid start and automatic generation control.

line manufacturing, has made available machines that not only offer the lowest available fuel costs, but at the same time sell for the lowest per-kilowatt capital cost.

The GE LMS100

The applicant will employ four General Electric LMS100 gas turbine generators in the PEC (PEC 2006a, AFC §§ 1.1, 1.2.2, 3.1, 3.4.1, 3.4.4.2, 3.4.6; Figs. 3.4-4, 3.4-5, 3.4-6). The LMS100 gas turbine represents the most modern and efficient such machine now available. This machine is nominally rated at 98.8 MW and 45.1 percent efficiency LHV at ISO[5] conditions (GTW 2006). (Staff compares alternative machines' ISO ratings as a common baseline, since project-specific ratings are not available for the alternative machines.)

In the LMS100, GE has taken a novel approach by combining technology from both aircraft engines and heavy industrial machines. Like most aeroderivatives, the LMS100 is basically a two-shaft engine, in which an initial low-pressure compressor section is driven by the final low-pressure turbine section. An independent high-pressure compressor section, spinning on a concentric shaft, is driven by the high-pressure turbine section. GE has done three things differently on the LMS100.

First, while the high-pressure compressor and turbine spool is taken from an aero engine (the GE CF6-80C2 that powers the Boeing 747 and the CF6-80E1 that powers the Boeing 767), the low pressure spool is taken from GE's industrial Frame 6 machine. Where the airflow (and, thus, power output) of GE's popular LM6000 aeroderivative engine (see below) was limited by airflow through the low pressure spool, this limit is removed by substituting these parts from the Frame 6.

Second, GE has employed a much more effective compressor interstage cooling system. On the LM6000 SPRINT[6] machine, after air has been partially compressed in the low pressure compressor, it is evaporatively cooled by spraying water into the interstage space. Since the air entering the high pressure compressor is now cooler than it would be without intercooling, less power is required to drive the high pressure compressor. This leaves more power to drive the electric generator, increasing both power output and fuel efficiency. On the LMS100, GE ducts the air discharged from the low pressure compressor away from the machine, where it can be more effectively cooled by a separate cooling system (once-through, evaporative or dry cooling systems can be employed). The cooled air is then ducted back into the high pressure compressor.

Third, GE has provided a third shaft, independent of the first two spools, to carry the power turbine,[7] which is in turn coupled to the electric generator. On most aeroderivative gas turbine generators, the generator is coupled directly to the low pressure turbine shaft. Since the generator must turn at synchronous speed (3,600 rpm in North America), the low pressure spool must also turn at this speed. This restricts design of the machine, preventing the turbine from operating at optimum levels. Since the

[5] International Standards Organization (ISO) standard conditions are 15°C (59°F), 60 percent relative humidity, and one atmosphere of pressure (equivalent to sea level).

[6] SPRINT stands for "SPRay INTercooling."

[7] This configuration is commonly found in helicopter engines.

LMS100's power turbine (and generator) are not mechanically coupled to the low pressure spool, this spool is free to spin at optimum speed (approximately 5,300 rpm at full load) (Morton 2005).

The net result of these design improvements is a doubling of power output, a ten percent improvement in fuel efficiency, and much greater operating flexibility. Where other gas turbine generators' fuel efficiency drops off rapidly when the machine is operated at less than full load, the LMS100's efficiency suffers much less at lower output. Further, the machine is capable of ramping at high rates. The LMS100 can be operated at loads as low as ten percent (10 MW), then ramped up quickly. When running at half load (50 MW), the machine can reach full load of nearly 100 MW in less than a minute. In addition, the LMS100 can go from a cold start to full load in ten minutes. Such operating flexibility make this the most capable machine available for providing such ancillary services as peaking, load following, spinning and non-spinning reserve, and automatic generation control.

Alternatives to the LMS100

Alternative machines that can meet the project's objectives are the LM6000 SPRINT, the SGT-800 and the FT8 TwinPac, which are aeroderivative machines adapted from General Electric, Siemens Power Generation and Pratt & Whitney aircraft engines, respectively.

The General Electric LM6000PC SPRINT gas turbine generator in a simple cycle configuration is nominally rated at 50.1 MW and 40.5 percent efficiency LHV at ISO conditions (GTW 2006).

The Pratt & Whitney FT8 TwinPac gas turbine generator in a simple cycle configuration is nominally rated at 51.4 MW and 38.4 percent efficiency LHV at ISO conditions (GTW 2006).

The Siemens SGT-800 gas turbine generator in a simple cycle configuration is nominally rated at 45 MW and 37 percent efficiency LHV at ISO conditions (GTW 2006).

Machine	Generating Capacity (MW)	ISO Efficiency (LHV)
GE LMS100	**98.8**	**45.1 %**
GE LM6000PC SPRINT	50.1	40.5 %
P & W FT8 TwinPac	51.4	38.4 %
Siemens SGT-800	45	37.0 %

Source: GTW 2006; Morton 2005

While the LMS100 enjoys a significant advantage in fuel efficiency over these alternative machines, its operating flexibility makes it even more attractive for peaking, load following and ancillary service than these efficiency numbers reflect. Staff agrees with the applicant that the GE LMS100 is the most appropriate choice of machine for the PEC.

The PEC will sell power to PG&E under the terms of a PG&E RFO (Request for Offers) contract approved by the California Public Utilities Commission. This contract specifically calls for the use of GE LMS100 gas turbine generators (PEC 2006a, AFC

§ 2.3). While PEC is thus required to employ this machine in the project, its selection would make good sense regardless.

Inlet Air Cooling

A further choice of alternatives involves the selection of gas turbine inlet air-cooling methods.[8] The two commonly used techniques are the evaporative cooler or fogger, and the chiller (mechanical or absorption); both techniques increase power output by cooling the gas turbine inlet air. In general terms, a mechanical chiller can offer greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An absorption chiller uses less electric power, but necessitates the use of a substantial inventory of ammonia. An evaporative cooler or a fogger boosts power output best on dry days; it uses less electric power than a mechanical chiller, possibly yielding slightly higher operating efficiency. The difference in efficiency among these techniques is relatively insignificant.

The applicant proposes to employ evaporative inlet air cooling and evaporative compressor interstage cooling (PEC 2006a, AFC §§ 1.1, 1.2.2, 1.2.4, 3.4.1, 3.4.4.1, 3.4.7, 3.9.2.1.2, 3.11.6). Inlet air cooling will be activated whenever the ambient temperature exceeds 60°F. Given the climate at the PEC site and the relative lack of superiority of one system over the other, staff agrees that the applicant's approach will yield no significant adverse energy impacts.

In conclusion, the project configuration (simple cycle) and generating equipment 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

Two nearby projects have been identified that could potentially combine with the PEC to create cumulative impacts on natural gas resources. One is a minor modification to the existing CalPeak Power Panoche No. 2 power plant. PEC considers it unlikely that this minor modification could affect natural gas consumption at the plant, and staff agrees. The other project is the Starwood Power Project, a 120 MW peaking power plant to be built adjacent to the PG&E Panoche substation. Starwood is also the result of a PG&E RFO contract, and like Panoche, it will be supplied with natural gas from the PG&E system. The PG&E natural gas supply system is adequate to supply both the PEC project and the Starwood project. Were this not true, PG&E would not have committed to supply these projects with gas.

NOTEWORTHY PUBLIC BENEFITS

The applicant proposes to provide flexible peaking and intermediate power and ancillary services, such as automatic generation control, during periods of high demand (typically

[8] A gas turbine's power output decreases as ambient air temperatures rise. Cooling the air as it enters the machine increases its power output.

hot summer days) (PEC 2006a, AFC §§ 1.1, 1.2.2, 3.4.1, 3.9.2.1, 3.11.4). By doing so in this most fuel-efficient manner, i.e., employing the most modern peaking gas turbine generators available, the PEC will provide a benefit to the electric consumers of California.

CONCLUSIONS

The project, if constructed and operated as proposed, would generate a nominal 400 MW of peaking and intermediate electric power at an overall project fuel efficiency of 40.7 percent LHV at maximum full load. 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 project would present no significant adverse impacts upon energy resources. No cumulative impacts on energy resources are likely.

PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification are proposed.

REFERENCES

PEC (Panoche Energy Center Project) 2006a — Application for Certification. Submitted to the California Energy Commission on August 2, 2006.

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POWER PLANT RELIABILITY

Steve Baker

SUMMARY OF CONCLUSIONS

Panoche Energy Center, LLC (PEC) predicts an equivalent availability factor of 95 to 99 percent, which staff believes is achievable. Based on a review of the proposal, staff concludes that the Panoche Energy Center Project will be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. No conditions of certification are proposed.

INTRODUCTION

In this analysis, Energy Commission staff addresses the reliability issues of the project to determine if the power plant is likely to be built in accordance with typical industry norms for reliability of power generation. Staff uses this level of reliability as a benchmark because it ensures that the resulting project would likely not degrade the overall reliability of the electric system it serves (see **Setting** below).

The scope of this power plant reliability analysis covers:

- equipment availability;
- plant maintainability;
- fuel and water availability; and
- power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While PEC has predicted an equivalent availability factor from 95 to 99 percent for the Panoche Energy Center Project (PEC) (see below), staff uses typical industry norms as a benchmark, rather than PEC's projection, to evaluate the project's reliability.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

No Federal, State or local/county laws, ordinances, regulations and standards (LORS) apply to the reliability of this project.

SETTING

In the restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the State's control area operators, such as the California Independent System Operator (Cal-ISO), that purchase, dispatch, and sell electric power throughout the State. How the Cal-ISO and other control area operators will ensure system reliability is an ongoing process; protocols are still being developed and put in place that will 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.

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.

The Cal-ISO's mechanisms to ensure adequate power plant reliability apparently have been devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, there is cause to believe that, under free market competition, financial pressures on power plant owners to minimize capital outlays and maintenance expenditures may act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants were to exhibit individual reliability sufficiently lower than this historical level, the assumptions used by Cal-ISO to ensure system reliability would prove invalid, with potentially disappointing results. Until the restructured competitive electric power system has undergone an adequate shakeout period, and the effects of varying power plant reliability are thoroughly understood and compensated for, staff will recommend that power plant owners continue to build and operate their projects to the level of reliability to which all in the industry are accustomed.

As part of its plan to provide needed reliability, the applicant proposes to operate the 400 MW (nominal output) PEC, a simple-cycle peaking power plant, providing flexible peaking and intermediate power and ancillary services to Pacific Gas and Electric Company (PG&E) as dispatched by PG&E (PEC 2006a, AFC §§ 1.1, 1.2.2, 3.4.1, 3.9.2.1, 3.11.4). The project is expected to achieve an equivalent availability factor (EAF) in the range of 95 to 99 percent (PEC 2006a, AFC § 3.11.4). The project is projected to actually operate at capacity factors up to 57 percent during each year of its operating life, being dispatched to serve peak loads at times of high demand (typically summer daytime) (PEC 2006a, AFC §§ 1.2.2, 3.4.1, 3.4.4.2, 3.11.4).

ASSESSMENT OF IMPACTS

METHOD FOR DETERMINING RELIABILITY

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.

The availability factor for a power plant is the percentage of the time that it is available to generate power; both planned and unplanned outages subtract from its availability.

Measures of power plant reliability are based on its actual ability to generate power when it is considered available and are based on starting failures and unplanned, or forced, outages. For practical purposes, reliability can be considered a combination of these two industry measures, making a reliable power plant one that is available when called upon to operate. Throughout its intended 30-year life (PEC 2006a, AFC § 3.11.4), the PEC will be expected to perform reliably. Power plant systems must be able to operate for extended periods without shutting down for maintenance or repairs. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability with scheduled maintenance outages, fuel and water availability, and resistance to natural hazards. Staff examines these factors for the project and compares them to industry norms. If they compare favorably, staff can conclude that the PEC will be as reliable as other power plants on the electric system, and will therefore not degrade system reliability.

EQUIPMENT AVAILABILITY

Equipment availability will be ensured by use of appropriate quality assurance/quality control (QA/QC) programs during design, procurement, construction and operation of the plant, and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

Quality Control Program

The applicant describes a QA/QC program (PEC 2006a, AFC § 3.11.8) typical of the power industry. Equipment will be purchased from qualified suppliers, based on technical and commercial evaluations. Suppliers' personnel, production capability, past performance, QA programs and quality history will be evaluated. The project owner will perform receipt inspections, test components, and administer independent testing contracts. Staff expects implementation of this program to yield typical reliability of design and construction. To ensure such implementation, staff has proposed appropriate conditions of certification under the portion of this document entitled **Facility Design**.

PLANT MAINTAINABILITY

Equipment Redundancy

A peaking generating facility commonly offers adequate opportunity for maintenance work during its downtime. During periods of extended dispatch, however, as could occur if other major generating or transmission assets were disabled, the facility may be required to operate for extended periods. A typical approach for achieving reliability in such circumstances 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 project (PEC 2006a, AFC §§ 1.1, 1.2.2, 2.3, 3.1, 3.4.1, 3.4.5.4, 3.4.5.5, 3.4.12.5, 3.4.12.6, 3.5.5, 3.9.2.5.1, 3.11.5.1, 3.11.5.3, 3.11.5.4, 3.11.5.5, 3.11.5.6; Table 3.4-1). The fact that the project consists of four combustion turbine-generators operating in parallel as independent equipment trains provides inherent reliability. A single equipment failure cannot disable more than one train, thus allowing the plant to continue to generate (at reduced output). Further, all plant ancillary systems are also designed with adequate

redundancy to ensure continued operation in the face of equipment failure (PEC 2006a, AFC § 3.4.1; Table 3.4-1). Staff believes that equipment redundancy will be sufficient for a project such as this.

Maintenance Program

The applicant proposes to establish a preventive plant maintenance program typical of the industry (PEC 2006a, AFC §§ 3.9.2.1, 3.9.2.1.1). Equipment manufacturers provide maintenance recommendations with their products; the applicant will base its maintenance program on these recommendations. The program will encompass preventive and predictive maintenance techniques. Maintenance outages will be planned for periods of low electricity demand. In light of these plans, staff expects that the project will be adequately maintained to ensure acceptable reliability.

FUEL AND WATER AVAILABILITY

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

Fuel Availability

The PEC will burn natural gas supplied by PG&E from the PG&E system. Natural gas fuel will be supplied to the project via a new 16-inch diameter 2,400 foot-long interconnection from the existing PG&E Line 2 north of the site (PEC 2006a, AFC §§ 1.2.1, 3.2, 3.4.6, 3.7.1, 3.9.4, 3.11.7.1). This natural gas system represents a resource of considerable capacity and offers access to adequate supplies of gas from the Rocky Mountains, Canada and the Southwest. 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 PEC will use water from two on-site wells for cooling tower makeup, evaporative inlet air cooler makeup, turbine combustor water injection, fire and service water, and safety and sanitary water (showers, safety showers, eyewash stations, sinks and toilets). Potable water for drinking will be provided by a bottled water supplier (PEC 2006a, AFC §§ 1.2.4, 3.1, 3.4.7, 3.11.7.2). A 240,000 gallon demineralized water storage tank and a 500,000 gallon raw water/fire water storage tank will allow the plant to continue operating for twelve hours in case of an interruption in water supply (PEC 2006a, AFC §§ 3.5.5, 3.11.5.4, 3.11.5.5; Table 3.4-1) Staff believes these sources, combined with the onsite storage capacity, yield sufficient likelihood of a reliable supply of water. (For further discussion of water supply, see the **Soil and Water Resources** section of this document.)

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, tsunamis (tidal waves), seiches (waves in inland bodies of water), and flooding will not

likely represent a hazard for this project, but seismic shaking (earthquake) may present a credible threat to reliable operation.

Seismic Shaking

The site lies within Seismic Zone 4 (PEC 2006a, AFC § 3.3.2.2); see that portion of this document entitled **Geology and Paleontology**. The project will be designed and constructed to the latest appropriate LORS (PEC 2006a, AFC Apps. C, D, E, F). 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.

Flooding

While the bulk of the site does not lie within either a 100-year or a 500-year floodplain, a portion does lie within a 100-year floodplain. This portion of the site will be filled and raised (PEC 2006a, AFC §§ 3.3.3.1, 3.5.9). Staff believes there are no concerns with power plant functional reliability due to flooding. For further discussion, see **Soil and Water Resources** and **Geology and Paleontology**.

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 2000 through 2005 (NERC 2006):

For Gas Turbine units (50 MW and larger):

Equivalent Availability Factor = 90.82 percent

The gas turbines that will be employed in the project are new on the market. General Electric (GE), manufacturer of the LMS100 gas turbines, is pursuing a development program for these units that is nearly unprecedented[1] in the gas turbine industry. New turbines typically undergo only systems tests during development, leaving final testing and shakedown to the initial commercial units. After the costly debacle that attended the release of GE's Frame 7F machine in the mid-1990s, GE committed to build and own the initial LMS100 power plant itself. Only after the machine had been thoroughly tested and proven did GE sell this initial plant to its ultimate owner, and proceed to deliver

[1] GE has taken this same approach on the initial Frame 7H machines being installed at the Inland Empire Energy Center project.

LMS100 machines to additional customers. That first machine, destined for the Basin Electric Power Cooperative's Groton, SD station, was delivered in late 2005 and was turned over to its new owner in summer 2006 (GTW 2006; Morton 2004).

The applicant's prediction of an equivalent availability factor of 95 to 99 percent (PEC 2006a, AFC § 3.11.4) appears reasonable compared to the NERC figure for similar plants throughout North America (see above) and in light of the development program being undertaken. In fact, these new machines can well be expected to outperform the fleet of various (mostly older) gas turbines that make up the NERC statistics. Further, since the plant will consist of four parallel gas turbine generating trains, maintenance can be scheduled during those times of year when the full plant output is not required to meet market demand, typical of industry standard maintenance procedures. The applicant's estimate of plant availability, therefore, appears realistic. The stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

NOTEWORTHY PROJECT BENEFITS

The applicant proposes to provide flexible peaking and intermediate power and power quality services, such as Automatic Generation Control, as dispatched by PG&E during periods of high demand (typically hot summer days) (PEC 2006a, AFC §§ 1.1, 1.2.2, 3.4.1, 3.9.2.1, 3.11.4). The fact that the project consists of four combustion turbine generators configured as independent equipment trains provides inherent reliability. A single equipment failure cannot disable more than one train, thus allowing the plant to continue to generate (at reduced output).

Although the gas turbines that will be employed in the project are new on the market, they can be expected to exhibit typically high availability due to the unique program GE is pursuing to ensure a reliable machine. The applicant's prediction of an equivalent availability factor of 95 to 99 percent appears achievable. Staff believes this should provide an adequate level of reliability.

CONCLUSION

PEC predicts an equivalent availability factor of 95 to 99 percent, which staff believes is achievable. Based on a review of the proposal, staff concludes that the plant would be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. No conditions of certification are proposed.

PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification are proposed.

REFERENCES

PEC (Panoche Energy Center Project) 2006a. Application for Certification. Submitted to the California Energy Commission on August 2, 2006.

GTW (Gas Turbine World). 2006 *Gas Turbine World*, July-August 2006, p. 9.

McGraw-Hill 1994. McGraw-Hill Energy Information Services Group. Operational Experience in Competitive Electric Generation, an Executive Report, 1994.

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TRANSMISSION SYSTEM ENGINEERING

Laiping Ng and Mark Hesters

SUMMARY OF CONCLUSIONS

The proposed Panoche Energy Center (PEC) outlet transmission lines and termination are acceptable and would comply with all applicable laws, ordinances, regulations, and standards (LORS). The PEC interconnection to the grid would require additional new downstream transmission facilities other than those proposed by the applicant needing California Environmental Quality Act (CEQA) review.

- The System Impact Study (SIS) indicates that the one-mile long Wilson-Gregg 230 kV line requires reconductoring. The applicant must provide a general analysis, sufficient to meet the CEQA requirements for indirect project impacts, of the reconductoring.
- The other adverse transmission system impacts can be mitigated by installation of Special Protection Schemes (SPS), operating procedures, disconnect switches and replacement of breakers. These upgrades would mitigate the incremental overloads caused by the PEC, along with all other pre-project overloads caused by projects in the generation interconnection queue.
- The proposed interconnecting facilities between the new Combustion Turbine Generators (CTG) and the Pacific Gas & Electric (PG&E) Panoche Substation including the step-up transformers, the 230 kV overhead transmission line and terminations are adequate and planned in accordance with good utility practices and are acceptable to staff according to engineering LORS.

INTRODUCTION

STAFF ANALYSIS

The Transmission System Engineering (TSE) analysis examines whether or not the facilities associated with the proposed interconnection conform to all applicable LORS required for safe and reliable electric power transmission. Additionally, under CEQA, the Energy Commission must conduct an environmental review of the “whole of the action,” which may include facilities not licensed by the Energy Commission (California Code of Regulations, title 14, §15378). Therefore, the Energy Commission must identify the system impacts and necessary new or modified transmission facilities downstream of the proposed interconnection that is required for interconnection and which represent the “whole of the action.”

Energy Commission staff relies on the interconnecting authority, in this case the California Independent System Operator (California ISO), for the analysis of impacts on the transmission grid from the proposed interconnection as well as the identification and approval of new or modified facilities downstream required as mitigation measures. The proposed PEC would connect to the PG&E transmission network and requires analysis by PG&E and approval of the California ISO.

PACIFIC GAS AND ELECTRIC'S ROLE

PG&E is responsible for ensuring electric system reliability in its system for addition of the proposed transmission modifications and determines both the standards necessary to achieve reliability and whether the proposed transmission modifications conform to those standards. The California ISO will provide analysis and reports in System Impact and Facilities studies, and its approval for the facilities and changes required in its system for addition of the proposed transmission modifications.

CALIFORNIA ISO'S ROLE

The California ISO is responsible for ensuring electric system reliability for all participating transmission owners and is also responsible for developing the standards necessary to achieve system reliability. The California ISO will determine the reliability impacts of the proposed transmission modifications on the PG&E transmission system in accordance with all applicable reliability criteria. According to the California ISO Tariffs, it will determine the "Need" for transmission additions or upgrades downstream from the interconnection point to insure reliability of the transmission grid. The California ISO will, therefore, perform the System Impact Study (SIS), provide their analysis, conclusions and recommendations, and issue a preliminary approval or concurrence letter to PG&E. On completion of the Facilities Study (FS), the California ISO will provide their conclusions and recommendations and issues final approval/disapproval letter for the interconnection of the proposed generation project. If necessary, the California ISO will provide written and verbal testimony on their findings at the Energy Commission hearings.

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, and operation or use of overhead electric lines and to the public in general.
- California Public Utilities Commission (CPUC) General Order 128 (GO-128), "Rules for Construction of Underground Electric Supply and Communications Systems," formulates uniform requirements and minimum standards to be used for underground supply systems to ensure adequate service and safety to persons engaged in the construction, maintenance, and operation or use of underground electric lines and to the public in general.
- The National Electric Safety Code, 1999, provides electrical, mechanical, civil, and structural requirements for overhead electric line construction and operation.
- NERC/WECC Planning Standards: The Western Electricity Coordinating Council (WECC) Planning Standards are merged with the North American Electric Reliability Council (NERC) Planning Standards and provide the system performance standards used in assessing the reliability of the interconnected system. These standards require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. Certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC

standards alone. These standards provide planning for electric systems so as to withstand the more probable forced and maintenance outage system contingencies at projected customer demand and anticipated electricity transfer levels, while continuing to operate reliably within equipment and electric system thermal, voltage, and stability limits. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WECC system is based to a large degree on Section I.A of the standards, "NERC and WECC Planning Standards with Table I and WECC Disturbance-Performance Table" and on Section I.D, "NERC and WECC Standards for Voltage Support and Reactive Power." These standards require that the results of power flow and stability simulations verify defined performance levels. Performance levels are defined by specifying the allowable variations in thermal loading, voltage and frequency, and loss of load that may occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a level that seeks to prevent system cascading and the subsequent blackout of islanded areas during a major disturbance (such as loss of multiple 500-kV lines along a common right of way, and/or multiple generators). While controlled loss of generation or load or system separation is permitted in certain circumstances, its uncontrolled loss is not permitted (WECC, 2002).

- North American Electric Reliability Council Reliability Standards for the Bulk Electric Systems of North America provide national policies, standards, principles, and guidelines to assure the adequacy and security of the electric transmission system. The NERC Reliability Standards provide for system performance levels under normal and contingency conditions. With regard to power flow and stability simulations, while these Reliability Standards are similar to NERC/WECC Standards, certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards for Transmission System Contingency Performance. The NERC Reliability Standards apply not only to interconnected system operation but also to individual service areas (NERC, 2006).
- California ISO Planning Standards also provide standards and guidelines to assure adequacy, security, and reliability in the planning of the California ISO transmission grid facilities. The California ISO Grid Planning Standards incorporate the NERC/WECC and NERC Reliability Planning Standards. With regard to power flow and stability simulations, these Planning Standards are similar to the NERC/WECC or NERC Reliability Planning Standards for Transmission System Contingency Performance. However, the California ISO standards also provide some additional requirements that are not found in the WECC/NERC or NERC standards. The California ISO standards apply to all participating transmission owners interconnecting to the California ISO controlled grid. They also apply when there are any impacts to the California ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the California ISO (California ISO, 2002a).
- California ISO/FERC (Federal Energy Regulatory Commission) Electric Tariff provides guidelines for construction of all transmission additions/upgrades (projects) within the California ISO controlled grid. The California ISO determines the "need" for the proposed project where it will promote economic efficiency or maintain

system reliability. The California ISO also determines the cost responsibility of the proposed project and provides an operational review of all facilities that are to be connected to the California ISO grid (California ISO, 2003a).

PROJECT DESCRIPTION

The proposed PEC would be a simple-cycle power generating facility located in the Fresno County east of the San Benito County line. The PEC would consist of four natural gas-fired combustion turbine generators with a nominal output of approximately 400 MW. Each generator would be connected to a dedicated 75/100/125 MVA generator step up (13.8/230 kV) transformer. Two Generation Units (One and Three) would interconnect to the transformers through circuit breakers and the remaining two units (Two and Four) would directly tie into the low side of the generator dedicated step up transformers. The high voltage side of each transformer would be connected to the PEC switchyard. The auxiliary power would be provided through back-fed transformer which is connected to Generator Unit One and Three. The PEC switchyard would consist of a 230 kV single strain bus with disconnect switches on each side of the circuit breaker. PEC switchyard would be connected to the PG&E's Panoche Substation via a new three phase 230kV overhead transmission line. Power would be distributed to the grid via transmission lines from the Panoche Substation.

The new 300-foot long, 795 kcmil ACSS transmission line would require two dead-end take off support structures to interconnect the PEC to the existing Panoche Substation. The existing Panoche Substation would require extension on the south side for about 320 feet by 300 feet for two new 230 kV bays, for the relocation of the Gates-Panoche Line #1 and Line #2. The PEC generation-tie line would be interconnected to a location vacated by these lines. New bus sectionalizing breakers and a new bus parallel breaker would be installed to accommodate the addition of PEC. The proposed commercial operation date is September 2009 (PEC 2006a, Section 1, 3, 3.4.5, 3.6, PEC 2007i).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

For the interconnection of a proposed generating unit or transmission facility to the grid, the interconnecting utility (PG&E in this case) and the control area operator (California ISO) are responsible for ensuring grid reliability. These entities determine the transmission system impacts of the proposed project, and any mitigation measures needed to ensure system conformance with performance levels required by utility reliability criteria, NERC planning standards, WECC reliability criteria, and California ISO reliability criteria. A SIS and a FS are used to determine the impacts of the proposed project on the transmission grid. Staff relies on the studies and any review conducted by the California ISO to determine the projects effect on the transmission grid and to identify any necessary downstream facilities or indirect project impacts required to bring the transmission network into compliance with applicable reliability standards.

The SIS and FS analyze the grid with and without the proposed project under conditions specified in the planning standards and reliability criteria. The standards and criteria define the assumptions used in the study and establish the thresholds through which

grid reliability is determined. The studies must analyze the impact of the project for the proposed first year of operation and thus are based on a forecast of loads, generation and transmission. Load forecasts are developed by the interconnecting utility and the California ISO. Generation and transmission forecasts are established by an interconnection queue. The studies are focused on thermal overloads, voltage deviations, system stability (excessive oscillations in generators and transmission system, voltage collapse, loss of loads or cascading outages), and short circuit duties.

If the studies show that the interconnection of the project causes the grid to be out of compliance with reliability standards then the study will identify mitigation alternatives or ways in which the grid could be brought into compliance with reliability standards. When a project connects to the California ISO controlled grid, both the studies and mitigation alternatives must be reviewed and approved by the California ISO. If the mitigation identified by California ISO or interconnecting utility includes transmission modifications or additions which require CEQA review as the "whole of the action," the Energy Commission must analyze the environmental impacts of these modifications or additions.

STATUS OF CALIFORNIA ISO STUDY

The California ISO has performed the SIS and proposed mitigation measures (PEC 2006g, Cover Letter). The California ISO granted the Preliminary Interconnection Approval to the interconnection of the PEC project. Staff is uncertain on the status of the FS but will update their analysis for the Final Staff Assessment.

SCOPE OF SYSTEM IMPACT STUDY

The SIS was performed by PG&E at the request of Panoche Energy Center, LLC, to identify the transmission system impacts caused by the PEC project on PG&E's 230 kV system. The SIS included a Power Flow Study, Short Circuit Study, and Dynamic Stability Analyses (PEC 2006g, Section 1). The study modeled the proposed PEC for a net output of 400 MW. The base cases included all planned generating facilities in PG&E's service territory, Sacramento Municipal Utility District, Turlock Irrigation District, and Silicon Valley Power whose on-line schedules are concurrent with or precede the proposed PEC project. The detailed study assumptions have been described in the SIS. The Power Flow studies were conducted with and without the PEC connected to the PG&E grid at the Panoche Substation using full loop base cases modeling 2010 summer peak, summer off-peak, and spring peak conditions. The Power Flow study assessed the project's impact on thermal loading of the transmission lines and equipment. Dynamic Stability Analyses were conducted with the PEC using the 2010 summer peak base cases to determine whether the PEC would create instability in the system following certain selected outages. Short Circuit Study was conducted with and without the PEC to determine if the PEC would result in overstressing existing substation facilities.

Power Flow Study Results and Mitigations

The SIS identified pre-project overloads (overloads that would occur whether or not the PEC is operating) in the transmission system and addition of the PEC will exacerbate the overloads. The overloading problems affect transmission line facilities under normal conditions, single contingency (N-1), and double contingence (N-2) conditions (See

definitions at the end of this document). The SIS identified required mitigation for the connection of, and power delivery from the PEC to PG&E's transmission system. The proposed mitigation measures for the post project conditions involve the reconductoring of transmission lines and the installation of Special Protection Systems (PEC 2006g, Section 12).

Overloads attributed to the PEC:

- Wilson – Gregg 230 kV (Story 1 – Gregg) Line: The line is loaded at 96% of its rated capacity under N-1 contingency conditions before the addition of the PEC. The addition of the PEC increases the forecasted loading by 7% and causes the line to overload.
    - Mitigation: The proposed mitigation for the forecasted 3% N-1 line overload would be to reconductor the one-mile long Wilson – Gregg 230 kV transmission line with conductors capable of handling 850 Amps or higher.
- Tivy Valley – Reedley 70 kV Line: The line is loaded at 94-109% of its rated capacity under N-2 contingency conditions before the addition of the PEC. The addition of the PEC increases the forecasted loading between 2 and 7% load increment resulting in overloads under some contingency conditions.
    - Mitigation: The proposed mitigation would be to install a Special Protection System to mitigate the overload.
- Coppermine – Tivy Valley 70 kV Line: The line is loaded at 99% of its rated capacity under N-2 contingency conditions before the addition of the PEC. The addition of the PEC increases the forecasted loading 2% and causes the line to overload.
    - Mitigation: The proposed mitigation would be to install a Special Protection System to mitigate the overload.
- Wilson – Oro Loma 115 kV (Le Grand Jct – Wilson) Line: The line is loaded at 96% of its rated capacity under N-2 contingency conditions. The addition of the PEC increases the forecasted loading by 10% and causes the line to overload.
    - Mitigation: The proposed mitigation would be to install a Special Protection System to mitigate the overloads.

Pre-project overloads whose mitigation would be the responsibility of other projects with a superior generation queue positions. Should these generation projects not materialize, PEC may be responsible for some or all of these upgrades.

- Borden – Gregg 230 kV Line: The line is overloaded under normal, N-1 and N-2 contingency conditions before the addition of the PEC. The PEC increases the forecasted overload by 3-6%.
    - Mitigation: The mitigation of these overloads is the responsibility of generation project P0507[1] because the project has superior generator interconnection queue position and/or earlier on line date.

[1] The project identification numbers refer to projects in the California ISO generator interconnection queue which can be found the California ISO website.

- Oro Loma – Canal #1 70 kV (Oro Loma – Dos Palos) Line: The line is overloaded under N-1 contingency conditions before the addition of the PEC. The PEC increases the forecasted overload by 2%.
    - Mitigation: The mitigation of the overload is the responsibility of generation project P0507 because the project has superior generator interconnection queue position and/or earlier on line date.
- Helm – Kerman 70 kV (Agrico – Kerman) Line: The line is overloaded under N-1 contingency conditions before the addition of the PEC. The PEC increases the forecasted overload by 3%.
    - Mitigation: The mitigation of the overload is the responsibility of generation project P0516 because the project has superior generator interconnection queue position and/or earlier on line date.
- Kerman – Keamey 70 kV Line: The line is overloaded under N-1 contingency conditions before the addition of the PEC. The PEC increases the forecasted overload by 1%.
    - Mitigation: The mitigation of the overload is the responsibility of generation project P0516 because the project has superior generator interconnection queue position and/or earlier on line date.
- Panoche – Oro Loma 115 kV Line: The line is overloaded under N-2 contingency conditions before the addition of the PEC. The PEC increases the forecasted overload by 5%.
    - Mitigation: The overload would be mitigated by operating procedures and/or SPS.
- Wilson – Le Grand 115 kV Line: The line is overloaded under N-2 contingency conditions before the addition of the PEC. The addition of the PEC increases the forecasted overload by 11%.
    - Mitigation: The overload would be mitigated by operating procedures and/or SPS.
- Hemdon – Ashlan 230 kV Line: The line is overloaded under N-2 contingency conditions before the addition of the PEC. The PEC increases the forecasted overload by 7%.
    - Mitigation: The overload would be mitigated by operating procedures and/or SPS.
- Le Grand – Dairland 115 kV Line: The line is loaded at 100% of its rated capacity under N-2 contingency conditions. The addition of the PEC increases the forecasted loading 11%.
    - Mitigation: The overload would be mitigated by operating procedures and/or SPS.
- McCall – Sanger #3 115 kV Line: The line is overloaded under N-2 contingency condition before the addition of the PEC. The PEC increases the forecasted overload by 2%.

- Mitigation: The overload would be mitigated by operating procedures and/or SPS.

Dynamic Stability Study Results

Dynamic Stability studies for PEC were conducted using 2010 summer peak full loop base case to determine if the PEC would create any adverse impact on the stable operation of the transmission grid following selected N-1 and N-2 outages (PEC 2006g, Section 9). The results indicate there are no adverse impacts on the stable operation of the transmission system following the selected disturbances, as outlined in the SIS for integration of the PEC (PEC 2006g, Section 9).

Short Circuit Study Results and Mitigations

Short circuit studies were performed to determine the degree to which the addition of the PEC project increases fault duties at PG&E's substations, adjacent utility substations, and the other 115 kV and 230 kV busses within the study area. The busses at which faults were simulated, the maximum three phase and single line-to-ground fault currents at these busses both without and with the PEC project, and information on the breaker duties at each location are summarized in Table 7-1: Short Circuit Study Results of the System Impact Study report. The Short Circuit Study indicates that the addition of the PEC would increase the fault currents of the three circuit breakers at the Panoche Substation. The mitigation would require a replacement of one 115 kV and two 230 kV circuit breakers within the fence line of the Panoche Substation. Generation project P0406 with a superior generation queue position and earlier on-line date has been assigned for the replacement. Should project P0406 not materialize, PEC would be responsible for replacing these breakers. The remaining breakers of the substations are adequate enough to withstand the post project incremental fault currents caused by the Short Circuit Study (PEC 2006g, Section 11).

COMPLIANCE WITH LORS

The SIS indicates that the project interconnection would comply with NERC/WECC planning standards and California ISO reliability criteria. The applicant will design, build and operate the proposed 230 kV overhead transmission line. The proposed modifications to the Panoche Substation would be done by PG&E. Staff concludes that with implementation of the proposed conditions of certification, the project will meet the requirements and standards of all applicable LORS.

CONCLUSIONS AND RECOMMENDATIONS

The proposed Panoche Energy Center outlet transmission lines and termination are acceptable and would comply with all applicable LORS. The PEC interconnection to the grid would require additional new downstream transmission facilities other than those proposed by the applicant needing CEQA review.

- The SIS indicates that the one-mile long Wilson-Gregg 230 kV line requires reconductoring. The applicant must provide a general analysis, sufficient to meet the CEQA requirements for indirect project impacts, of the reconductoring.

- The other adverse transmission system impacts can be mitigated by installation of Special Protection Schemes, operating procedures, disconnect switches and replacement of breakers. These upgrades will mitigate the incremental overloads caused by the PEC, along with all other pre-project overloads caused by projects in the generation interconnection queue.
- The proposed interconnecting facilities between the new Combustion Turbine Generators and the PG&E Panoche Substation including the step-up transformers and the 230 kV overhead transmission line and terminations are adequate in accordance with good utility practices and are acceptable to staff according to engineering LORS.

CONDITIONS OF CERTIFICATION FOR TSE

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

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Table 1: Major Equipment List** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

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

TSE-2 Prior to the start of construction the project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who

is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or D) a mechanical engineer. (Business and Professions Code Sections 6704 et seq. require state registration to practice as a civil engineer or structural engineer in California.)

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical or civil and design engineer assigned in conformance with Facility Design condition **GEN-5**, may be responsible for design and review of the TSE facilities.

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

The electrical engineer shall:

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

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

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

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

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the

project owner shall document the discrepancy and recommend corrective action. (2001 California Building Code, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance). The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and shall reference this condition of certification.

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

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

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

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

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

1. The existing Panoche Substation will require expansion and upgrades to accommodate the addition of the PEC.
    a. The Substation will require expansion for about 300 by 320 feet.
    b. Install a pair of bus sectionalizing breakers to split the busses into two double-bus sections.

c. Install one 230 kV bus parallel breaker on the north side using the existing spare bay.

d. Adding two new 230 kV bays, one for the relocation of the Gates-Panoche Line #1 and the other for the new generation tie line.

e. Protection requirements will consist of a fully redundant, double-pilot current differential scheme for the generation tie line, four current transformers and protective relays replacement.

2. The PEC would be interconnected to the Panoche Substation via a single 230 kV transmission line approximately 300 feet long with 795 kcmil ACSS conductor.

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

4. Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.

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

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

7. Termination facilities shall comply with applicable PG&E interconnection standards.

8. The project owner shall provide to the CPM:

   a. The final Detailed Facility Study (DFS) including a description of facility upgrades, operational mitigation measures, and/or Special Protection System sequencing and timing if applicable,

   b. Executed project owner and California ISO Facility Interconnection Agreement

9. A request for minor changes to the facilities described in this condition may be allowed if the project owner informs the CBO and CPM and receives approval for the proposed change. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or substation configurations

shall not begin without prior written approval of the changes by the CBO and the CPM.

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

1. Design drawings, specifications and calculations conforming with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", California ISO standards, National Electric Code (NEC) and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.

2. For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst case conditions"[2] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", California ISO standards, National Electric Code (NEC) and related industry standards.

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

4. The final DFS, including a description of facility upgrades, operational mitigation measures, and/or SPS sequencing and timing if applicable, shall be provided concurrently to the CPM.

5. At least 60 days prior to the construction of transmission facilities, the project owner shall inform the CBO and the CPM of any impending changes which may not conform to the facilities described in this condition and request approval to implement such changes.

TSE-6 The project owner shall provide the following Notice to the California Independent System Operator prior to synchronizing the facility with the California transmission system:

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

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

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

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

TSE-7 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", California ISO standards, National Electric Code (NEC) and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

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

1. "As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", California ISO standards, National Electric Code (NEC) and related industry standards.

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

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

REFERENCES

California ISO 1998a. California ISO Tariff Scheduling Protocol posted April 1998, Amendments 1,4,5,6, and 7 incorporated.

California ISO 1998b. California ISO Dispatch Protocol posted April 1998.

California ISO 2002a. California ISO Grid Planning Standards, February 2002.

NERC (North American Electric Reliability Council) 2006. Reliability Standards for the Bulk Electric Systems of North America, May 2 2006.

PEC (Panoche Energy Center Project) 2006a. Application for Certification. Submitted to the California Energy Commission on August 2, 2006.

PEC (Panoche Energy Center Project) 2006c. System Impact Study. Submitted to the California Energy Commission on August 9, 2006.

PEC (Panoche Energy Center Project) 2006e. Supplement to the Application for Certification. Submitted to the California Energy Commission on November 7, 2006.

PEC (Panoche Energy Center Project) 2006g. Interconnection System Impact Re-study Report). Submitted to the California Energy Commission on December 22, 2006.

PEC (Panoche Energy Center Project) 2007i. Substation Expansion Letter. Submitted to the California Energy Commission on May 7, 2007.

WECC (Western Electricity Coordinating Council) 2002. NERC/WECC Planning Standards, August 2002.

DEFINITION OF TERMS

AAC - All Aluminum conductor

ACSR - Aluminum Conductor Steel - Reinforced

ACSS - Aluminum Conductor Steel - Supported

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) that carries the current.

Congestion Management - Congestion management is a scheduling protocol, which provides that dispatched generation and transmission loading (imports) will not violate criteria.

Double Contingency - Also known as emergency or N-2 condition, occurs when a forced outage of two system elements usually (but not exclusively) caused by one single event. Examples of an N-2 contingency include loss of two transmission circuits on single tower line or loss of two elements connected by a common circuit breaker due to the failure of that common breaker.

Emergency Overload - See Single Contingency. This is also called an N-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 that interrupts an existing circuit, diverts it to another connection and returns it back to the interrupted circuit, thus forming a loop or cul de sac.

Megavar - One megavolt ampere reactive.

Megavars - Mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.

Megavolt Ampere (MVA) - A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

Megawatt (MW) - A unit of power equivalent to 1,341 horsepower.

N-0 Condition - See Normal Operation/Normal Overload

Normal Operation/ Normal Overload (N-0) - 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.

N-2 Condition - See Double 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.

Special Protection Scheme/System (SPS) - A SPS detects a transmission outage (either a single or credible multiple contingency) or an overloaded transmission facility and then trip or run back generation output to avoid potential overloaded facilities or other criteria violations.

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.

Tap - A transmission configuration creating an interconnection through a sort single circuit to a small or medium sized load or a generator. The new single circuit line is inserted into an existing circuit by utilizing breakers at existing terminals of the circuit, rather than installing breakers at the interconnection in a new switchyard.

Undercrossing - A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

Underbuild - A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

ALTERNATIVES

James W. Reede, Jr., Ed.D

PURPOSE OF THE ALTERNATIVES ANALYSIS

The California Environmental Quality Act (CEQA) allows a state agency, such as the California Energy Commission, to utilize its own "regulatory program" review process in lieu of the "environmental impact report" (EIR) review process specified in CEQA. However, to do so the agency's regulatory program must be "certified" by the Secretary of the Resources Agency (Public Resources Code §21080.5). The Energy Commission's Power Plant Siting Regulatory Program is such a "certified regulatory program" under CEQA.

With regard to the "Alternatives" analysis required in a certified siting proceeding such as the Panoche Energy Center (PEC) application, the CEQA Guidelines (California Code of Regulations, Title 14, §15252) state that:

"The document used as a substitute for an EIR or negative declaration in a certified program shall include at least the following items:

(b) Either:

1. Alternatives to the activity and mitigation measures to avoid or reduce any significant or potentially significant effects that the project might have on the environment, or

2. A statement that the agency's review of the project showed that the project would not have any significant or potentially significant effects on the environment and therefore no alternatives or mitigation measures are proposed to avoid or reduce any significant effects on the environment. This statement shall be supported by a checklist or other documentation to show the possible effects that the agency examined in reaching this conclusion."

The Energy Commission's Siting Regulations (Cal. Code Regs., tit. 20, Section 1765) require that:

"At the hearings . . . on an application exempt from the [Notice Of Intent] requirements pursuant to Public Resources Code section 25540.6, the parties shall present information on the feasibility of available site and facility alternatives to the applicant's proposal which substantially lessen the significant adverse impacts of the proposal on the environment. . . ."

In light of these provisions, staff presents information in this section on 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" (Cal. Code Regs., tit. 20, §1765). Staff also analyzes whether there are any feasible alternative designs or alternative technologies, including the "no project alternative," that may be capable of reducing or avoiding any potential impacts of the proposed project while achieving its major objectives.

SCOPE AND METHOD FOR THIS ALTERNATIVE ANALYSIS

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 and potential significant impacts of the project.
- Determine whether there are any feasible *site alternatives* for analysis by evaluating the extent to which most of the project objectives can be achieved at alternative sites and the degree to which any significant impacts of the project would be substantially lessened at such alternative sites.
- Identify and evaluate *facility design and related facilities alternatives* to the project as proposed.
- Identify and evaluate *technical 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 the construction of alternative technologies (e.g. wind, solar, or geothermal).
- Evaluate the feasibility and impacts of not constructing the project (the "*no project*" *alternative*).

STAFF'S ALTERNATIVES ANALYSIS

Staff's alternatives analysis begins by identifying the basic objectives of the project, describing the project and project setting, and listing potential significant impacts from the project as currently proposed. The analysis then turns to a consideration of various alternatives to the proposed Panoche Energy Center (PEC) project. These alternatives were developed in response to information received from the applicant, Energy Commission's staff and from other agencies.

BASIC OBJECTIVES OF THE PROJECT

After studying the Applicant's Application for Certification (AFC), Energy Commission staff has determined the PEC project's objectives to be:

- Development of a project to meet the contractual terms of the Pacific Gas & Electric, Power Purchase agreement dated March 28, 2006.
- Meet various vendor requirements necessary for power generation and environment control equipment guarantees.
- A project that could obtain all required permits due to a lack of significant adverse environmental impacts.
- A site that is located near an existing substation and transmission line.
- 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 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

The project area is located in an unincorporated area of western Fresno County, adjacent to the Panoche Hills. The site is approximately 12 miles southwest of the city of Mendota, 16 miles south-southwest of the city of Firebaugh and approximately 2 miles east of Interstate 5, adjacent to the Pacific Gas & Electric (PG&E) existing Panoche Substation. The proposed site and substation are located south of West Panoche Road. The site is more specifically described as the Southwest Quarter of Section 5, Township 15 South, Range 13 East, on the United States Geological Survey (USGS) Quadrangle map. The assessor's parcel number (APN) is 027-060-78S.

The facility site will be located on a 12.8-acre site within a 128-acre parcel. The construction laydown area, including laydown and parking, consists of an 8-acre portion of the 128-acre parcel immediately south of the 12.8-acre plant site. The plant site and construction area are leased by the applicant from the property owners. The 128-acre parcel is currently in agricultural production with pomegranate trees. Proposed offsite improvements associated with the project include a new 400-foot paved, 24-foot wide access road south of West Panoche Road to the plant site, 2,400 linear feet of new gas pipeline, and a new 300-foot transmission line to tie into the Panoche Substation. A project-related activity is PG&E's planned expansion of its Panoche Substation by approximately 2.2 acres south of the existing substation boundary.

See **Project Description Figure 1** for a map of the location of the proposed project site and related facilities.

POWER PLANT EQUIPMENT AND LINEAR FACILITIES

The PEC would be a nominal 400 megawatt (MW) simple-cycle power plant consisting of four General Electric LMS100 natural gas-fired combustion turbine generators and associated equipment. The PEC is designed as a peaking facility to meet electric generation load during periods of high demand. The project is expected to have an annual capacity factor of approximately 57% equivalent to 5,000 operating hours.

Auxiliary equipment will include inlet air foggers with evaporative coolers, a step up transformer, compressed air system, control enclosures, aqueous ammonia storage tank, natural gas fuel system, water treatment system, water storage tanks, wastewater system, site stormwater drainage system, and a lined evaporation pond.

Associated equipment will include emission control systems necessary to meet the proposed emission limits using best available control technology. Stack emission NO_x in normal operation will be controlled to 2.5 parts per million, volumetric dry (ppmvd) corrected to 15% oxygen through a combination of water injection in the combustors and operation of a selective catalytic reduction (SCR) system with 19% aqueous ammonia to further reduce NOx emissions, and an oxidation catalyst to reduce the emission of carbon monoxide (CO) and volatile organic compounds (VOCs).

Project Description Figure 3 shows the general arrangement and layout of the proposed facility. **Project Description Figure 4** provides an architectural rendering of the proposed facility.

TRANSMISSION LINE

The PEC will connect to the PG&E electrical transmission system at the adjacent Panoche Substation. The connection will require approximately 300 feet of new 230 kilovolt (kV) transmission line located within the plant site and PG&E's substation. The transmission interconnection requires a 2.2 acre substation expansion to be constructed concurrent with proposed project construction. Interconnection at this substation minimizes impacts to the PG&E transmission system while providing efficient peaking power for use during peak demand periods as projected by PG&E.

WATER SUPPLY

Process water for the cooling towers and other non-potable water uses are proposed to be supplied to the PEC from two new groundwater wells drilled onsite into the Westside Sub-basin of the San Joaquin Valley Groundwater Basin. These wells would draw water for cooling purposes, an industrial use, from what staff has determined to be a potable-water aquifer. This lower aquifer is also used for drinking water by the cities of Mendota and Firebaugh after normal state mandated filtration and chlorination.

These wells would also supply facility showers, sinks, toilets, eye wash stations, and safety showers. Unless the applicant properly filters the water, signs would be posted to alert personnel that water drawn from these wells is not for human consumption. Potable water would supplied to the PEC by a bottled water service.

WASTEWATER DISCHARGE

Process wastewater will be disposed of using a deep well injection system. The construction phase will have portable toilets with weekly servicing, i.e., pumping into tanker trucks, thus eliminating the need for a construction phase wastewater discharge system. During the operational phase, sanitary wastes will be directed to a septic system and leach field designed to treat the sanitary flow from the administration and control building and restrooms.

NATURAL GAS SUPPLY PIPELINE

Natural gas will be delivered to the site via a new 2,400 foot lateral, high-pressure pipeline that would connect to a PG&E high-pressure gas trunk line located east of PG&E's electrical substation. This pipeline would connect with the project on the eastern side of the site at a new gas metering station. At the plant site, the natural gas will pass through a flow-metering station, gas scrubber/filtering equipment, gas pressure control station, electric-driven booster compressors (when required), and a fuel gas heater prior to entering the combustion turbines. The gas line is shown on **Project Description Figure 2**.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS

Two technical areas are identified in this PSA that have potentially significant adverse environmental impacts. These impacts are the use of water for cooling that is considered potable and elimination of San Joaquin Kit Fox foraging areas. It is staff's opinion that mitigation measures proposed for the PEC will reduce any potential significant environmental impacts to less than significant levels.

ALTERNATIVES TO THE PROJECT

As discussed above, the Energy Commission siting regulations require the parties in a siting case exempt from the Notice of Intention proceedings to present "information on the feasibility of available site and facility alternatives to the applicant's proposal which substantially lessen the significant adverse impacts of the proposal on the environment" (Cal. Code Regs., tit. 20 §1765). The AFC did not provide an alternative site discussion. Subsequent to filing the AFC, the applicant provided addresses and alternative sites it considered during the project development phase (PEC 2007m and PEC 2007n).

SITE ALTERNATIVES

Consistent with the CEQA Guidelines, the scope of staff's consideration of alternative sites was guided by consideration of whether most project objectives could be accomplished at alternative sites, and whether locating the project at an alternative site would substantially lessen any identified significant impacts of the project (Cal. Code Regs., tit. 14 §15126.6(a)).

As discussed below, staff has determined that locating the project at an alternative site would not achieve most of the major objectives of the project. Furthermore an alternative site location would not substantially lessen currently identified potential significant impacts of the project.

Staff selected four sites to be reviewed as alternatives, two identified by the applicant and two selected by staff based on prior knowledge of the area. Of these four alternative sites, three are near or adjacent to the PG&E Los Banos Control Station, and one adjacent to the PG&E Gates Substation. The applicant had initially considered a Los Banos site and the Gates site. All were environmentally inferior to the proposed due to potential significant impacts to Endangered Species Act listed species. The three Los Banos sites are all identified as San Joaquin Kit Fox primary habitat versus foraging areas at the Panoche proposed site and Gates Substation. These Los Banos sites also support other endangered species (see **Table 1** below) and listed populations of burrowing owls, Tule elk, kangaroo rats, and golden eagles. As shown in **Table 1** below, the biological environmental impacts at the alternative sites were more significant.

Table 1
Comparison of the Alternative Sites

Sites	Panoche Energy Center	Los Banos-1	Los Banos-2	Los Banos-3	Gates
Size (1)	128 Acres	306 Acres	150 Acres	300 Acres	82.64 Acres
Zoning	Exclusive Agriculture (AE-20)	Exclusive Agriculture (A-2)	Exclusive Agriculture (A-2)	Exclusive Agriculture (A-2)	Exclusive Agriculture (AE-20)
DOC Farmland Designation	Prime Farmland	Grazing Land	Grazing Land	Grazing Land	Prime Farmland
Current Use	Agriculture	Open space and agricultural use adjacent to substation fence line,	Wind Farm, agricultural use adjacent to substation fence line	Wind Farm agricultural use adjacent to substation fence line	Agriculture
Impacts	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Biological Resources	San Joaquin Kit Fox Foraging Area	Primary Habitat for: San Joaquin Kit Fox Burrowing Owls Tule Elk Kangaroo Rat Golden Eagles	Primary Habitat for: San Joaquin Kit Fox Burrowing Owls Tule Elk Kangaroo Rat Golden Eagles	Primary Habitat for: San Joaquin Kit Fox Burrowing Owls Tule Elk Kangaroo Rat Golden Eagles	San Joaquin Kit Fox Foraging Area
Impacts	Significant	Significant	Significant	Significant	Significant
Water Resources	Applicant proposes use of Potable	Non-potable available	Non-potable available	Non-potable available	Non-potable available
Impacts	Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant

(1) The project would require permanent use of 12.8 acres plus 8 acres of temporary use for laydown.
(2) The California Department of Conservation (DOC) classifies crop and grazing lands on Important Farmland Inventory maps for each county with agricultural activity.

In addition to the alternative sites shown in Table 1, staff also investigated the possibility of locating the proposed project adjacent to the 230 kilovolt line that runs from the Gates Substation to the Los Banos Control Center. Staff discovered during interviews of the Los Banos Control Station Supervisor and Operating Engineer on June 6, 2007, that PG&E requires a plant of that size to either tie-in to a substation bus or reconductor the line to handle the power. In addition, staff determined that placing the proposed project adjacent to the 230 kV power line at any alternative site would require reconducturing of between 40 and 80 miles of transmission lines causing additional significant impacts. Under these circumstances, staff has applied the “rule of reason” and decided that it

need not perform a detailed analysis of additional alternative sites such as those that may exist along the Los Banos-Gates 230kV Line.

Meeting Major Objectives of the Project

PEC's basic objectives are to provide economically competitive electricity in Northern California while minimizing impacts and costs by making use of related infrastructure to the extent feasible. The project as proposed in the AFC would make use of an adjacent substation switchyard to connect to the transmission grid.

Based on this analysis, staff has determined that the proposed project makes substantial use of existing infrastructure. A "stand-alone" simple cycle power plant at an alternative site that makes no use of the infrastructure at the proposed site is possible. However, this alternative would not achieve one of the major objectives of this project, namely the avoidance of the significant impacts and costs of the project by using existing on-site infrastructure to the extent feasible.

Staff also analyzed the feasibility of a combined-cycle plant as an alternative to the proposed simple-cycle plant. A combined-cycle plant would require construction of additional cooling tower cells, greatly increasing water consumption, additional transmission line and equipment upgrades, and expansion of the existing site with increased environmental impacts. While a combined-cycle more efficiently uses natural gas, this alternative would also not achieve the major objectives of this project, such as the avoidance of the additional significant impacts and installation of peaking capabilities.

Reducing Significant Environmental Impacts

Staff's review of the proposed project has identified two potentially significant impacts, the use of potable inland waters and San Joaquin kit fox foraging area intrusion. Staff's analysis of these impacts is discussed below. Staff's assessment has not identified any significant impacts that would be substantially lessened by locating the project at an alternative site.

"Site" Alternatives Conclusion

Staff's analysis of the four alternative sites, presented in Alternatives Table 1, is based on a review of the major objectives of the project, and the significant impacts identified in this document. Staff first considered whether the project's objectives could be accomplished at alternative sites. Staff found that while developing a similar project at an alternative site is possible, it would not minimize environmental impacts, which is one of the major objectives of the project. Staff also considered whether locating the project at an alternative site would substantially lessen any identified significant impacts of the project, and concluded that none were superior to the proposed site. Locating a similar project at an alternative location would not substantially reduce any of the significant impacts of the project identified to date and would potentially increase the magnitude of the significant impacts. Staff also considered a combined-cycle configuration and determined that it would not meet the project objectives. Based on these three factors, staff has applied the "rule of reason" and determined that a detailed alternative sites analysis is not needed.

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 buildings, appliance standards for specific items 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, building 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 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.

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]. Both solar and wind generation can be credited with an absence or reduction in air pollutant emissions and need for related controls, and visible plumes. In the case of biomass, however, emissions can be substantially greater. In addition, the

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[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.

[2] There are no geothermal or hydroelectric resources in this western section of the 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.

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, solar and wind resources require large land areas in order to generate 400 megawatts of electricity. Specifically, central receiver solar thermal projects require approximately 5 acres per megawatt; 400 megawatts would require approximately 2000 acres, or over 160 times the amount of land area taken by the proposed PEC site and linear facilities. Parabolic trough solar thermal technology requires similar acreage per megawatt. Wind generation “farms” generally require about 4.5 acres per megawatt, with 400 megawatts requiring 1800 acres, nearly 150 times the amount of space taken by the proposed plant site and linear facilities. Projects with greater land requirements in the western San Joaquin Valley have the potential for significant biological impacts on sensitive species and habitat areas. The need for extensive acreage would also add the complexities of local (Fresno County) discretionary actions for land use modifications. While there would not be visible plumes, other visual impacts of the large solar arrays and windfarm generators must be considered in an area that has many broad views of the Sierra Nevada, Panoche Hills, and the Coast Range mountains from Interstate 5.

For biomass generation a fuel source such as wood chips (the preferred source) or agricultural waste is necessary. Agricultural waste is available in large quantities close to the PEC plant. However, biomass plants are typically under 50 MW, which is substantially smaller than the expected capacity of the 400 MW PEC project.

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 peaking facility to meet the growing demands for reliable power in Northern California. Consequently, staff does not believe that geothermal, hydroelectric, solar, wind or biomass technologies present feasible alternatives to the proposed project.

RELATED FACILITIES ALTERNATIVES

The following related facilities pertain only to those associated with the applicant’s preferred power plant site.

WATER SUPPLY

A detailed analysis of water supply alternatives is presented in the Soil and Water Resources section of this PSA. Alternatives to the proposed water supply plan include use of upper aquifer brackish water, recycled water from the City of Mendota Wastewater Treatment Plant, the use of hybrid (wet /dry) or dry cooling systems for the cooling towers, and a verifiable Water Conservation Off-Set Plan. These alternatives, which can help to reduce the water consumption of power plants, are presented in the **Soil and Water Resources** section.

WASTEWATER DISPOSAL

The AFC proposes to use a deep well injection system. The staff agrees that wastewater deep well injection is the most environmentally sound option for PEC’s

disposal of wastewater because it avoids the potentially more significant environmental impacts of off-site discharge and complies with the zero liquid discharge off-site goal.

NATURAL GAS SUPPLY PIPELINE

Natural gas will be delivered to the site via a new 2,400-foot high-pressure, lateral pipeline that would connect to a PG&E high-pressure gas trunk line located east of PG&E's electrical substation. This pipeline would connect with the project on the eastern side of the site at a new gas metering station. There is no feasible alternative supply or route that would lessen the impacts.

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.

Staff has not identified any potentially significant unmitigated impacts.

Staff views the "no project" alternative as feasible. If this project is not built, the same market conditions that encouraged it to be proposed will encourage other similar projects. It is quite feasible that a substantial amount of additional generating capacity will be proposed even in the absence of this project. Staff can reasonably expect California's need for new electric power plants to be filled with or without the proposed project. There is no reason to assume that the total amount of capacity actually built would differ with or without this project.

It follows then, that the extent to which nuclear and older fossil generation resources will be replaced by new resources can be expected to be the same with or without this project. The extent to which generation from existing power plants would consume fuel and emit pollutants would be likely the same with or without this project.

The "no project alternative would eliminate the expected economic benefits that the proposed project would bring to Fresno County, including increased property taxes, employment, sales taxes, and sales of services, manufactured goods, and equipment. (See the **Socioeconomics** chapter.)

Staff has determined that the "no project" alternative is environmentally superior to the project as originally proposed. This is because the original proposal could have had significant environmental impacts on local and regional air quality, the San Joaquin Kit Fox, and the agricultural lands. Not constructing and operating an (unmitigated) power plant would avoid these impacts. However, as stated above, staff believes that use of the mitigation described in the various sections will reduce any impacts to less than significant levels. In addition, staff recognizes potential economic benefits will be derived from the project. Therefore, staff believes that, overall, the "no project" alternative is not the preferred alternative.

CONCLUSIONS AND RECOMMENDATION

Staff has analyzed in detail alternatives to the project design and related facilities, alternative technologies, and the “no project” alternative. Staff did not analyze in detail alternative sites for the project. Staff determined that developing the project at an alternative site would not allow PEC to make use of infrastructure at the proposed site, one of the major objectives of the project, and would not substantially lessen the significant impacts of the project identified in the staff’s assessment.

Staff has determined that the preferable alternative is the proposed project using suggested mitigation. Staff does not believe that energy efficiency measures and alternative technologies (geothermal, solar, wind, and hydroelectric) present any feasible alternatives to the proposed project.

REFERENCES

PEC (Panoche Energy Center Project) 2006a – Application for Certification. Submitted to the California Energy Commission on August 2, 2006.

PEC (Panoche Energy Center Project) 2006c – System Impact Study. Submitted to the California Energy Commission on August 9, 2006.

PEC (Panoche Energy Center Project) 2006d – Application to the USEPA for an Underground Injection Well Control Permit. Submitted to the California Energy Commission on September 25, 2006.

California Dept of Conservation (CDOC) 2006a – Comments and Recommendations. Submitted to the California Energy Commission on September 28, 2006.

PEC (Panoche Energy Center Project) 2006e – Supplement to the Application for Certification. Submitted to the California Energy Commission on November 7, 2006.

PEC (Panoche Energy Center Project) 2006g – Interconnection System Impact Re-study Report). Submitted to the California Energy Commission on December 22, 2006.

PEC (Panoche Energy Center Project) 2007a – Data Responses. Submitted to the California Energy Commission on January 9, 2007.

PEC (Panoche Energy Center Project) 2007c – Revised AFC Figure 5.5-5, Daily and Annual Water Flows. Submitted to the California Energy Commission on February 16, 2007.

PEC (Panoche Energy Center Project) 2007d – Data Responses Round 2. Submitted to the California Energy Commission on March 1, 2007.

PEC (Panoche Energy Center Project) 2007e – Technical Memorandum on Expanded Evaluation of Water Supply and Wastewater Discharge Alternatives. Submitted to the California Energy Commission on March 5, 2007.

USDOJ (US Dept of Justice) 2007a – Final Environmental Impact Statement, Federal Correctional Institution - Mendota California. Submitted to the California Energy Commission on March 7, 2007.

SJVAPCD (San Joaquin Valley Air Pollution Control District) 2007a – CEQA Comments regarding the proposed power plant. Submitted to the California Energy Commission on March 5, 2007.

PEC (Panoche Energy Center Project) 2007f – PEC Supplemental Discussion of Water Supply and Wastewater Discharge Alternatives. Submitted to the California Energy Commission on March 29, 2007.

FRES (Fresno County) 2007a – Site Plan Review. Submitted to the California Energy Commission on April 10, 2007.

PEC (Panoche Energy Center Project) 2007g – Revised Response to Round 2 Data Request #26. Submitted to the California Energy Commission on April 24 2007.

PEC (Panoche Energy Center Project) 2007h – Water Quality Evaluation Technical Memorandum III. Submitted to the California Energy Commission on April 25, 2007.

PEC (Panoche Energy Center Project) 2007i – Substation Expansion Letter. Submitted to the California Energy Commission on May 7, 2007.

PEC (Panoche Energy Center Project) 2007j – UIC Permit Application Revision. Submitted to the California Energy Commission on May 7, 2007.

PEC (Panoche Energy Center Project) 2007k – UIC Permit Application Revision proposed locations map. Submitted to the California Energy Commission on May 16, 2007.

PEC (Panoche Energy Center Project) 2007L – Copy of Biological Assessment submitted to the US Fish & Wildlife Service. Submitted to the California Energy Commission on May 21, 2007.

PEC (Panoche Energy Center Project) 2007m – PEC Alternative Site Locations - Supplemental Info. Submitted to the California Energy Commission on May 22, 2007.

PEC (Panoche Energy Center Project) 2007n – Alternatives maps and tables. Submitted to the California Energy Commission on May 31, 2007.

GENERAL CONDITIONS
INCLUDING
COMPLIANCE MONITORING AND CLOSURE PLAN

Lance Shaw

INTRODUCTION

The project's General Compliance Conditions of Certification, including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in compliance with public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of elements that:

- set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
- set forth the requirements for handling confidential records and maintaining the compliance record;
- state procedures for settling disputes and making post-certification changes;
- state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions of certification;
- establish requirements for facility closure plans; and
- specify conditions of certification for each technical area containing the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of assuring that the condition has been satisfied.

DEFINITIONS

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

PRE-CONSTRUCTION SITE MOBILIZATION

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

CONSTRUCTION GROUND DISTURBANCE

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

CONSTRUCTION GRADING, BORING, AND TRENCHING

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

CONSTRUCTION

[From section 25105 of the Warren-Alquist Act.] Onsite work to install permanent equipment or structures for any facility. Construction does **not** include the following:

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

START OF COMMERCIAL OPERATION

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

COMPLIANCE PROJECT MANAGER RESPONSIBILITIES

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

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

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

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval, the approval will involve all appropriate Energy Commission staff and management.

PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING

The CPM usually schedules pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings 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 ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight, and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

ENERGY COMMISSION RECORD

The Energy Commission shall maintain as a public record, in either the Compliance file or Dockets 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 of certification changes and the resulting staff or Energy Commission action.

PROJECT OWNER RESPONSIBILITIES

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

COMPLIANCE CONDITIONS OF CERTIFICATION

Unrestricted Access (COMPLIANCE-1)

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 (COMPLIANCE-2)

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

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

Compliance Verification Submittals (COMPLIANCE-3)

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission’s procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified as necessary by the CPM, 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. providing appropriate letters from delegate agencies verifying compliance;

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

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

Verification lead times (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, it shall so request in its submittal cover letter and include a detailed explanation of the effects on the project if this date is not met.

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

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

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Various lead times (e.g., 30, 60, 90 days) for submittal of compliance verification documents to the CPM for conditions of certification are established to allow sufficient staff time to review and comment and, if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

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

If the project owner anticipates starting project construction as soon as the project is certified, it may be necessary for the project owner to file compliance submittals prior to project certification. This is important if the required lead-time for a required compliance event extends beyond the date anticipated for start of construction. It is also important that the project owner understand that the submittal of compliance documents prior to project certification is at the owner’s own risk. Any approval by Energy Commission staff is subject to change based upon the Commission Decision.

COMPLIANCE REPORTING

There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions

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

Compliance Matrix (COMPLIANCE-5)

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

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

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

Monthly Compliance Report (COMPLIANCE-6)

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

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

1. a summary of the current project construction 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 submitted as attachments to the Monthly Compliance Report;

3. an initial, and thereafter updated, compliance matrix showing the status of all conditions of certification (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);

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

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

6. a cumulative listing of any approved changes to conditions of certification;

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

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

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

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

Annual Compliance Report (COMPLIANCE-7)

After construction is complete, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by the CPM. Each Annual Compliance Report shall identify the reporting period and shall contain the following:

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

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

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

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

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

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

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

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

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

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

Confidential Information (COMPLIANCE-8)

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

Annual Energy Facility Compliance Fee (COMPLIANCE-9)

Pursuant to the provisions of Section 25806(b) of the Public Resources Code, the project owner is required to pay an annual fee currently sixteen thousand eight hundred fifty dollars ($16,850), which will be adjusted annually on July 1. The initial payment is due on the date the Energy Commission adopts the final decision. All subsequent payments are due by July 1 of each year in which the facility retains its certification. The payment instrument shall be made payable to the California Energy Commission and mailed to: Accounting Office MS-02, California Energy Commission, 1516 9th St., Sacramento, CA 95814.

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

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

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

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

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies to the CPM of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form (Attachment A).

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made that provide the flexibility to deal with the specific situation and project setting that exist at the time of closure. Laws, Ordinances, Regulations and Standards (LORS) pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

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

CLOSURE DEFINITIONS

Planned Closure

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

Unplanned Temporary Closure

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

Unplanned Permanent Closure

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

COMPLIANCE CONDITIONS FOR FACILITY CLOSURE

Planned Closure (COMPLIANCE-11)

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

The plan shall:

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

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

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

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

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

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

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

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

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

necessary steps to mitigate public health and safety impacts and environmental impacts are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less 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 unplanned permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the on-site contingency plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

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

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

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

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

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

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

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

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

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

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

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

Amendment

The project owner shall petition the Energy Commission, pursuant to Title 20, California Code of Regulations, Section 1769, when proposing modifications to the project (including linear facilities) design, operation, or performance requirements. If a proposed modification results in deletion or change of a condition of certification, or makes changes that would cause the project not to comply with any applicable laws, ordinances, regulations or standards, the petition will be processed as a formal amendment to the final decision, which requires public notice and review of the Energy Commission staff analysis, and approval by the full Commission. This process takes approximately two to three months to complete, and possibly longer for complex project modifications.

Change of Ownership

Change of ownership or operational control also requires that the project owner file a petition pursuant to section 1769 (b). This process takes approximately one month to complete, and requires public notice and approval by the full Commission.

Insignificant Project Change

Modifications that do not result in deletions or changes to conditions of certification, and that are compliant with laws, ordinances, regulations and standards may be authorized by the CPM as an insignificant project change pursuant to section 1769(a) (2). This process usually takes less than one month to complete, and it requires a 14-day public review of the Notice of Insignificant Project Change that includes staff's intention to approve the modification unless substantive objections are filed.

Verification Change

A verification may be modified by the CPM without requesting an amendment to the decision if the change does not conflict with the conditions of certification and provides an effective alternate means of verification. This process usually takes less than five working days to complete.

CBO DELEGATION AND AGENCY COOPERATION

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

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

ENFORCEMENT

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Energy Commission Decision. The specific action and amount of any fines the Energy Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, oversight, unforeseeable events, and other factors the Energy Commission may consider.
Moreover, to ensure compliance with the terms and conditions of certification and applicable LORS, delegate agencies are authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

NONCOMPLIANCE COMPLAINT PROCEDURES

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

The Energy Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Energy Commission about power plant construction or operation-related questions, complaints or concerns.

Informal Dispute Resolution Procedure

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

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

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

Request for Informal Investigation

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

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and within seven working days of the CPM's request, provide a written report to the CPM of the results of the investigation, including corrective measures proposed or undertaken. Depending on the urgency of the noncompliance matter, the CPM may conduct a site

visit and/or request the project owner to provide an initial report, within 48 hours, followed by a written report filed within seven days.

Request for Informal Meeting

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

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

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

3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner; 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 that 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 with the Energy Commission's Dockets Unit. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1237.

KEY EVENTS LIST

PROJECT: _____

DOCKET #: _____

COMPLIANCE PROJECT MANAGER: _____

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

COMPLIANCE TABLE 1
SUMMARY of COMPLIANCE CONDITIONS OF CERTIFICATION

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-1	Unrestricted Access	The project owner shall grant Energy Commission staff and delegate agencies or consultants unrestricted access to the power plant site.
COMPLIANCE-2	Compliance Record	The project owner shall maintain project files on-site. Energy Commission staff and delegate agencies shall be given unrestricted access to the files.
COMPLIANCE-3	Compliance Verification Submittals	The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed or the project owner or his agent.
COMPLIANCE-4	Pre-construction Matrix and Tasks Prior to Start of Construction	Construction shall not commence until the all of the following activities/submittals have been completed: ▪ property owners living within one mile of the project have been notified of a telephone number to contact for questions, complaints or concerns, ▪ a pre-construction matrix has been submitted identifying only those conditions that must be fulfilled before the start of construction, ▪ all pre-construction conditions have been complied with, ▪ the CPM has issued a letter to the project owner authorizing construction.
COMPLIANCE-5	Compliance Matrix	The project owner shall submit a compliance matrix (in a spreadsheet format) with each monthly and annual compliance report which includes the status of all compliance conditions of certification.
COMPLIANCE-6	Monthly Compliance Report including a Key Events List	During construction, the project owner shall submit Monthly Compliance Reports (MCRs) which include specific information. The first MCR is due the month following the Energy Commission business meeting date on which the project was approved and shall include an initial list of dates for each of the events identified on the Key Events List.
COMPLIANCE-7	Annual Compliance Reports	After construction ends and throughout the life of the project, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports.

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

ATTACHMENT A

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.)

PREPARATION TEAM

PANOCHE ENERGY CENTER
PREPARATION TEAM

Executive Summary	James W. Reede, Jr., Ed.D
Introduction	James W. Reede, Jr., Ed.D
Project Description	James W. Reede, Jr., Ed.D
Air Quality & Plume Analysis	William Walters P.E. / Lisa Blewitt
Biological Resources	Heather Blair
Cultural Resources	Beverly Bastian
Hazardous Materials Management	Rick Tyler / Alvin Greenberg, PhD
Land Use	Amanda Stennick
Noise	Shabab Khoshmasrab, P.E.
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Socioeconomic Resources	Joseph Diamond, PhD
Soils and Water Resources	Dick Anderson / Somer Goulet M.S.E.L.
Traffic and Transportation	James Adams
Transmission Line Safety and Nuisance	Obed Odoemelam, PhD
Visual Resources	Mark Hamblin
Waste Management	Ellie Townsend-Hough
Worker Safety and Fire Protection	Rick Tyler / Alvin Greenberg, PhD
Facility Design	Shabab Khoshmasrab, P.E.
Geology and Paleontology	Patrick Pilling, PhD, P.E., G.E.
Power Plant Efficiency	Steve Baker, P.E.
Power Plant Reliability	Steve Baker, P.E.
Transmission System Engineering	Mark Hesters / Laiping Ng
Alternatives	James W. Reede, Jr., Ed.D
Compliance Monitoring and Facility Closure	Lance Shaw
Project Secretary	Terry Piotrowski / Renae Maher

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA

APPLICATION FOR CERTIFICATION FOR THE PANOCHE ENERGY CENTER	**Docket No. 06-AFC-5** **PROOF OF SERVICE** **(Revised 6/27/07)**

INSTRUCTIONS: All parties shall 1) send an original signed document plus 12 copies OR 2) mail one original signed copy AND e-mail the document to the web address below, AND 3) all parties shall also send a printed OR electronic copy of the documents that shall include a proof of service declaration to each of the individuals on the proof of service:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 06-AFC-5
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

APPLICANT

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Public Advisers Office
pao@energy.state.ca.us

DECLARATION OF SERVICE

I, Terry Piotrowski, declare that on June 29, 2007, I deposited copies of the attached Preliminary Staff Assessment in the United States mail at Sacramento, CA with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

OR

Transmission via electronic mail was consistent with the requirements of California Code of Regulations, title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above.

I declare under penalty of perjury that the foregoing is true and correct.

Original Signed By
Terry Piotrowski