STAFF REPORT

Final Staff Assessment (Part 1)

THREE MOUNTAIN POWER PROJECT

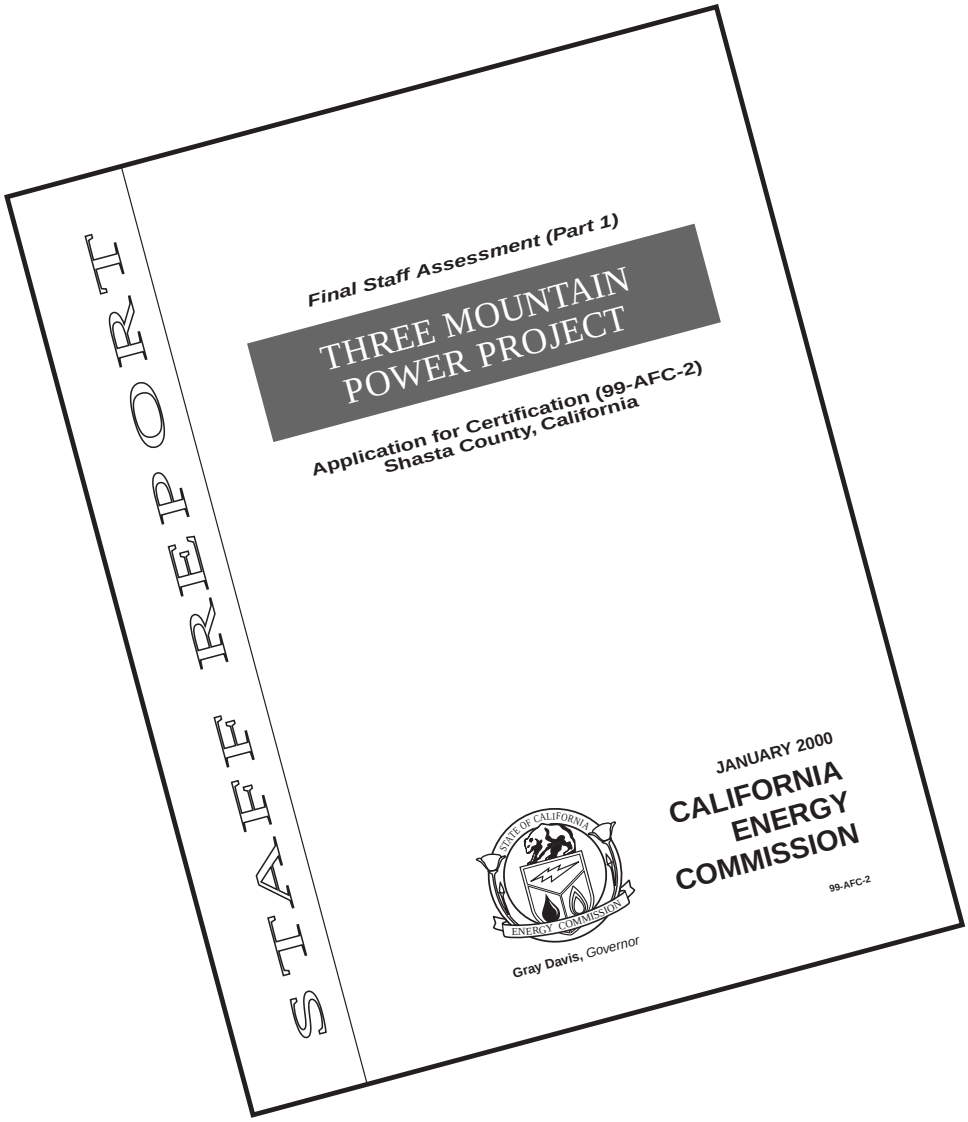
Application for Certification (99-AFC-2)
Shasta County, California

JANUARY 2000

CALIFORNIA ENERGY COMMISSION

Gray Davis, *Governor*

99-AFC-2



CALIFORNIA ENERGY COMMISSION

Richard Buell, *Energy Commission Project Manager*
Robert Haussler, *Manager*

SITING OFFICE

Robert L. Therkelsen, *Deputy Director*

**ENERGY FACILITIES SITING &
ENVIRONMENTAL PROTECTION DIVISION**

THREE MOUNTAIN POWER PROJECT
EXECUTIVE SUMMARY

INTRODUCTION

This Final Staff Assessment (FSA) contains the California Energy Commission (Energy Commission) staff's evaluation of the Three Mountain Power, LLC's (the applicant) Application for Certification (AFC) (99-AFC-2) for the Three Mountain Power Project (TMPP). The TMPP electric generating plant and related facilities, such as the electric transmission line, natural gas pipeline and water lines, are under the Energy Commission's jurisdiction and cannot be constructed or operated without the Energy Commission's certification.

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

BACKGROUND

On March 3, 1999, the applicant filed an AFC with the Energy Commission to construct and operate the TMPP. On April 14, 1999, the Energy Commission determined that the application should not be accepted due to data inadequacies. On June 4, 1999, the applicant filed supplemental information to address the list of data inadequacies adopted by the Energy Commission. The Energy Commission deemed the application complete at its June 23, 1999 business meeting. The analyses contained in this FSA are based upon information from: 1) the AFC; 2) subsequent amendments; 3) responses to data requests; 4) supplementary information from local and state agencies and interested individuals; 5) existing documents and publications; and 6) independent field studies and research.

PROJECT DESCRIPTION

The TMPP will be located in northeastern Shasta County, approximately one mile northeast of Burney, California, and 45 miles east of Redding, California. The site is located on a 40-acre site that is zoned for industrial use. Approximately one-third of the site is currently developed and used by Burney Mountain Power, LLC, which operates a 10 megawatt (MW) biomass-fueled power plant. The site is located on State Route 299 northeast of Black Ranch Road between the towns of Burney and Johnson Park, (Township 35 North, Range 3 East, on Assessor's Parcel Number 030-390-36). See **PROJECT DESCRIPTION** Figures 1 and 2 for the location of the project.

The 500 MW nominal rated combined cycle design will consist of two "F" class combustion turbines (170 MW each), two heat recovery steam generators (HRSG) and one steam turbine (up to 230 MW). The applicant is currently considering two manufacturers for the "F" class combustion turbines: General Electric and Westinghouse. The combined cycle configuration will incorporate water treatment equipment, air compressor, inlet air evaporative coolers, turbine and generator set, continuous emission monitors, control room and administrative building, step-transformers, heat recovery steam generators, a steam turbine, two 140 foot exhaust stacks, cooling towers, selective catalytic reduction (SCR) and aqueous ammonia storage and handling equipment. The SCR and ammonia are used to reduce nitrogen oxide (NOx) emissions. The SCR and dry low NOx combustion technology will reduce NOx emissions from the combined cycle configurations to 2.5 ppmvd, or less, at 15 percent oxygen. The heat recovery steam generators are used to recover waste heat from the combustion turbine exhaust to produce steam. This steam is then expanded in the steam turbine to produce electricity. The project is expected to have an overall availability of 95 percent and to operate up to 8,760 hours per year.

The project consists of a power island, administrative buildings, chemical storage areas, cooling tower and other support facilities. Natural gas will be supplied to the project via a new 2,500 to 7,000 foot 12-inch pipeline connection with Pacific Gas and Electric Company's (PG&E) natural gas pipeline located southeast of the project site. The applicant has identified three alternative routes for the natural gas pipeline connection. The applicant's September 2, 1999 response to staff's data request 16 indicated that route A will be used. This route calls for a 2,900 foot connection. In the applicant's January 7, 2000 comments on the Preliminary Staff Assessment (PSA) the applicant amended its proposal to identify that water will be supplied to the project by either the Burney Water District or from wells constructed and operated by the applicant. If the Burney Water District supplies the water, it will construct approximately 3,000 feet of new 14-inch inch pipeline to connect new wells to the Burney Water District storage tank and construct a new 4,700 foot 24-inch pipeline from the new wells to the project site. In the alternative, if the applicant cannot reach an agreement with the Burney Water District, the applicant will drill its own wells in the same location as the proposed Burney Water District wells. The applicant will also construct a new 4,700 foot 24-inch pipeline from the new wells to the project site to provide 3,500 acre-feet of water per year.

A new PG&E switchyard will be located on the project site. The line connecting the TMPP facility to PG&E's switchyard will be a 230 kV single circuit transmission line. The tie-in with the existing PG&E 230 kV Pit River hydro transmission line is approximately 800 feet west and then 1800 feet in a northerly direction adjacent to the McCloud River Railroad easement. The Pit #1-Pit #3 230 kV transmission circuit and the Pit #1-Cottonwood 230 kV transmission circuit will be intersected and looped to the new PG&E switchyard. To accommodate the TMPP power output, 60 lineal miles of reconductoring[1] utilizing existing towers to the Round Mountain and

[1] "Reconductoring" consists of removing the old insulators, installing new insulators and replacing the old conductors with new conductors with a higher capacity.

Cottonwood substations is proposed. These transmission lines are shown on **PROJECT DESCRIPTION** Figure 1.

The project is estimated to have a capital cost of about $250 million. The applicant plans to complete construction and start operation of the TMPP by the second quarter of 2002. During construction, an average of approximately 200 workers would be employed. During operation, the TMPP would employ 20 to 25 full-time staff.

STAFF'S ASSESSMENT

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

- the project's conformity with integrated assessment of need;
- the environmental setting of the proposal;
- impacts on public health and safety, and measures proposed to mitigate these impacts;
- environmental impacts, and measures proposed to mitigate these impacts;
- the engineering design of the proposed facility, and engineering measures proposed to ensure the project can be constructed and operated safely and reliably;
- project closure;
- project alternatives;
- compliance of the project with all applicable laws, ordinances, regulations and standards (LORS) during construction and operation; and
- proposed conditions of certification, where these can be identified at this time.

COMPLETE ANALYSES

Staff's FSA analyses will be published in two Parts. Part 1 consists of the following 19 technical areas, which staff considers substantially complete:

Need Conformance	Socioeconomics
Public Health	Waste Management
Hazardous Materials Handling	Geology and Paleontology
Transmission Line Safety & Nuisance	Facility Design
Land Use *	Reliability
Traffic and Transportation	Efficiency
Noise	Transmission System Engineering
Visual Resources *	General Conditions/Compliance
Cultural Resources	Worker Safety and Fire Protection
Biological Resources *	

**Additional analyses in these areas may be necessary; see discussion below.*

These topic areas were the subjects of workshop discussions in mid-December 1999 and early January 2000. Staff has received written comments from various parties on these sections. Staff's conclusions, recommendations and proposed conditions of certification for these topic areas have been modified, as staff deemed appropriate, to address these comments. The staff's Visual Resources, Land Use, and Biological Resources FSA sections may require additional analysis. Staff's final conclusions on visual resources are pending staff's review of the applicant's visible plume analysis. Staff's review of the applicant's visible plume analysis should be completed by the time hearings are scheduled on this subject. Staff is still analyzing the potential land use conflicts between the proposed project and the McArthur-Burney Falls Memorial State Park, which are related to the water use of the proposed TMPP. Completion of staff's biological resources analysis is also pending resolution of water resources issues (see below). Supplemental testimony on both land use and biological resources may be required and could be filed with Part 2 of the FSA. In addition, staff may recommend mitigation measures to address water resources and air quality issues that may require staff to reevaluate its conclusions and recommendations for other topic areas identified. If this is the cases, supplemental testimony or errata may be required for some topic areas.

INCOMPLETE ANALYSES

Four technical areas, **Air Quality, Soils and Water Resources, Biological Resources, and Alternatives** are incomplete. These topics will be addressed in Part 2 of the FSA, to be published on March 17, 2000. The following provides a brief discussion on the status of staff's analysis in the topic areas.

AIR QUALITY

The Shasta County Air Quality Management District (District) issued its Preliminary Determination of Compliance (PDOC) on January 5, 2000. The comment period on the PDOC will end on February 4, 2000. Based on normal practice, staff believes the District will be able to issue its Final Determination of Compliance (FDOC) thirty days later. Staff will require a minimum of 14 days to incorporate the findings and conditions contained in the FDOC in its air quality FSA. Based on these events, staff expects that it will be able to meet the Committee's schedule for issuing an air quality FSA on March 17, 2000.

In addition, staff has identified that the project may contribute to significant **local** air quality impacts due to its particulate matter less than 10 microns (PM10) emissions. Staff believes these local air quality impacts need to be mitigated with **local** emission reductions, offsets. The applicant has proposed road paving to mitigate the project's PM10 impacts. However, staff does not believe that road paving will provide adequate mitigation of the project's PM10 impacts during the winter months, when ambient levels of PM10 are high in the local area. Therefore, staff has requested the applicant to investigate stove and fireplace upgrades in the Burney area to mitigate the project's PM10 impacts. The applicant's responses to staff's data requests are expected in February 2000, and staff believes a substantial amount of work is required to ensure the retrofits provide adequate mitigation for the project.

SOILS AND WATER RESOURCES

Staff believes that three issues remain to be resolved for soil and water resoures: 1) whether the project as proposed will result in a significant impact on ground water quality; 2) whether the project as proposed will adversely effect water supply in the project area, and consequently, adversely effect domestic and wildlife water users; and 3) whether the project as proposed conforms with applicable regulations. On January 4, 2000, staff received a letter from the Central Valley Regional Water Quality Control Board (CVRWQCB), which identified additional analysis requirements. Staff also issued additional data requests on January 21, 2000, seeking clarification of the applicant's proposal, baseline water information and examination of project alternatives. These data requests were discussed at the workshop on January 14, 2000. Therefore, staff expects that the applicant can make an expeditious response to these requests. However, staff believes there is a possibility that the applicant may need to modify its proposal to address water quality and supply issues. If a "major" change is made to the project proposal to address these issues, staff believes it may not be able to meet the schedule due date for the Soil & Water Resources FSA of March 17, 2000. In addition, any "major" modification may effect the adequacy and accuracy of other topic areas. In the event that staff identifies that additional time will be required to prepare its Soil & Water Resources FSA, it will notify the Committee and parties as soon as that determination is made and will identify why the additional time is required and what analyses will be performed.

BIOLOGICAL RESOURCES

As noted above, this FSA contains a section on Biological Resources. However, this section is incomplete, because it is currently unclear how the applicant will address water quality and water supply issues. The implication of these issues and how it affects staff's analysis on biological resources is discussed in the Biological Resources section of this FSA. Since completion of staff's biological resources analysis is dependent on resolution of water resources issues, publishing of this section will follow soil & water resources (see above).

ALTERNATIVES

Staff's alternatives analysis published on December 10, 1999 only contained its criteria for alternative site selection and identification of sites to be analyzed in the FSA. Staff has requested additional time to complete its alternatives analyses. The alternatives FSA section will be published in Part 2 on March 17, 2000.

STAFF RECOMMENDATION

Since staff has not completed its analyses for air quality, soil & water resources, biological resources, and alternatives, we believe it is premature to tender any recommendations on the Three Mountain Power Project. However, staff strongly believes that if issues in these topic areas can not be resolved satisfactorily, it would have to recommend that the application be denied.

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INTRODUCTION

Prepared by Richard Buell

PURPOSE OF THIS REPORT

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

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

The analyses contained in this FSA are based upon information from: 1) the AFC; 2) subsequent amendments; 3) responses to data requests; 4) supplementary information from local and state agencies and interested individuals; 5) existing documents and publications; 6) independent field studies and research; and written and oral comments received on the Preliminary Staff Assessment (PSA) . The FSA presents conclusions and proposed conditions that apply to the design, construction, operation, and closure of the proposed facility. Each proposed condition of certification is followed by a proposed means of "verification." The verification is not part of the proposed condition, but is the Energy Commission Compliance Unit's method of ensuring post-certification compliance with adopted requirements.

The Energy Commission staff's analyses were prepared in accordance with Public Resources Code, section 25500 et seq. and Title 20, California Code of Regulations, section 1701 et seq., and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.) and its guidelines (Cal. Code Regs., Title 14, § 15000 et seq.).

ORGANIZATION OF THE FINAL STAFF ASSESSMENT

The **INTRODUCTION** section of this FSA explains the purpose of the FSA and its relationship to the Energy Commission's siting process. The **PROJECT DESCRIPTION** section of the FSA provides a brief overview of the project including its purpose, location, and major project components. The environmental and engineering evaluations of the proposed project follow the **PROJECT DESCRIPTION**. This FSA will not contain a **NEED CONFORMANCE** section, since the legislature eliminated the requirement to conduct an integrated assessment of need in Senate Bill 110, enacted in 1999. In the environmental analyses, the project's environmental setting is described, environmental impacts are identified and their significance assessed, and the project's compliance with applicable laws is reviewed. The mitigation measures proposed by the applicant are reviewed for adequacy and conformance with applicable LORS; any remaining unmitigated impacts are identified, and additional mitigation measures and project alternatives are proposed by staff when necessary. Staff's conclusions and recommendations are discussed, and proposed conditions of certification are included, if applicable. In the engineering analyses, the project is evaluated in each technical area with respect to applicable LORS and performance objectives. Staff proposed modifications to the facility, if applicable, are listed. Each technical section ends with a discussion of facility closure, conclusions and recommendations. Proposed conditions of certification are included, if applicable.

ENERGY COMMISSION SITING PROCESS

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

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

In addition, staff must assess the completeness and adequacy of the project's health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, section 1743(b). Staff is required to develop a compliance plan (coordinated with other agencies) to ensure that applicable LORS, are met (Cal. Code Regs., tit. 20, section 1744(b).

Staff conducts its environmental analysis in accordance with the requirements of the California Environmental Quality Act (CEQA). No Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been certified by the Resources Agency (Public Resource Code, section 21080.5, Cal. Code Regs., tit. 14, section 15251(k). The Energy Commission's certified process implements the subjective portions of CEQA.

The staff normally prepares both a Preliminary Staff Assessment (PSA) and Final Staff Assessment (FSA). The FSA presents the staff's final analysis, conclusions, and recommendations. The FSA incorporates written comments on the PSA and comments on the PSA received at PSA workshops. The FSA serves as staff's testimony on a proposal.

Staff uses the PSA to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. During the period between publishing the PSA and FSA, staff conducts workshops to discuss our findings, proposed mitigation, and proposed compliance monitoring requirements. Based on these workshops and written comments, staff refines its analysis, corrects errors, and finalizes conditions of certification to reflect areas where we have reached agreement with the parties. This FSA will serve as staff's testimony in those area where parties agree that the issues are ready for evidentiary hearings. If there are areas the parties do not believe are ready for hearings, staff may recommend bifurcating the FSA and issue a supplemental final staff assessment.

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

Following the hearings, the Committee's recommendation to the full Energy Commission on whether or not to approve the proposed project will be contained in a document entitled the Presiding Members' Proposed Decision (PMPD). Following publication, the PMPD is circulated for a minimum of 30 days in order to receive written public comments, and a public hearing may be held to take additional comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. A revised PMPD is required to undergo a 15-day comment period. At the close of the comment period for the revised PMPD, the PMPD is submitted to the full Energy Commission for decision. Following Energy Commission adoption, any party may appeal the decision to the Energy Commission within 30 days.

A Compliance Monitoring Plan and General Conditions will be assembled from conditions contained in the FSA and other evidence presented at the hearings. The Compliance Monitoring Plan and General Conditions are contained in this FSA and will be presented in the PMPD. The Energy Commission staff's implementation of

the plan ensures that a certified facility is constructed, operated, and closed in compliance with the conditions adopted by the Energy Commission. The proposed Compliance Monitoring Plan and General Conditions are included at the end of the FSA.

PROJECT DESCRIPTION

Prepared by Richard K. Buell

NATURE AND PURPOSE OF PROJECT

The Three Mountain Power Project, Limited Liability Company (applicant) proposes to construct and operate the 500 megawatt (MW) Three Mountain Power Project (TMPP) natural gas fueled electricity generation power plant. Electrical energy produced from the proposed merchant power plant will be sold in California's newly restructured electricity market. The applicant's stated objectives for the project are to:

1. Expedite construction and operation schedules by using an existing site under applicant's control.
2. Use a readily available, secure water supply for the facility's cooling water, and a readily available means of handling wastewater discharge.
3. Use a site with appropriate geological conditions, including geotechnical compatibility and consideration of local floodplain characteristics.
4. Maximize compatibility with existing land use and zoning.
5. Maximize local community acceptability with consideration of noise, public health, worker safety, and hazardous materials handling issues.
6. Maximize the project's ability to meet air quality requirements.
7. Minimize the miles of new transmission line construction required to connect with the existing Pacific Gas and Electric (PG&E) 230 kilovolt (kV) transmission line
8. Minimize the construction distance of the natural gas tie-in line to the PG&E natural gas transmission line.
9. Minimize the project's visibility and impacts on visual resources.
10. Minimize the impact on endangered species and their habitats.
11. Minimize the impact on cultural resources.

PROJECT LOCATION

The TMPP will be located in northeastern Shasta County, approximately one mile northeast of Burney, California, and 45 miles east of Redding, California. The site is located on a 40-acre site that is zoned for industrial use. Approximately one-third of the site is currently developed and used by Burney Mountain Power, LLC, which operates a 10 megawatt (MW) biomass-fueled power plant. The site is located on State Route 299 northeast of Black Ranch Road between the towns of Burney and Johnson Park, (Township 35 North, Range 3 East, on Assessor's Parcel Number 030-390-36). See **PROJECT DESCRIPTION** Figures 1 and 2 for the location of the project.

PROJECT DESCRIPTION Figure 1
Regional Setting

PROJECT DESCRIPTION Figure 2
Local Setting

PROJECT DESCRIPTION

PROJECT DESCRIPTION Figure 3 shows the proposed equipment layout for the project. The 500 MW nominal rated combined cycle design will consist of two "F" class combustion turbines (170 MW each), two heat recovery steam generators (HRSG) and one steam turbine (up to 230 MW). The applicant is currently considering two manufacturers for the "F" class combustion turbines: General Electric and Westinghouse. The combined cycle configuration will incorporate water treatment equipment, air compressor, inlet air evaporative coolers, turbine and generator set, continuous emission monitors, control room and administrative building, step-transformers, heat recovery steam generators, a steam turbine, two 140 foot exhaust stacks, cooling towers, selective catalytic reduction (SCR) and aqueous ammonia storage and handling equipment. The SCR and ammonia are used to reduce nitrogen oxide (NOx) emissions. The SCR and dry low NOx combustion technology will reduce NOx emissions from the combined cycle configurations to 2.5 ppmvd, or less, at 15 percent oxygen. The heat recovery steam generators are used to recover waste heat from the combustion turbine exhaust to produce steam. This steam is then expanded in the steam turbine to produce electricity. The project is expected to have an overall availability of 95 percent and to operate up to 8,760 hours per year.

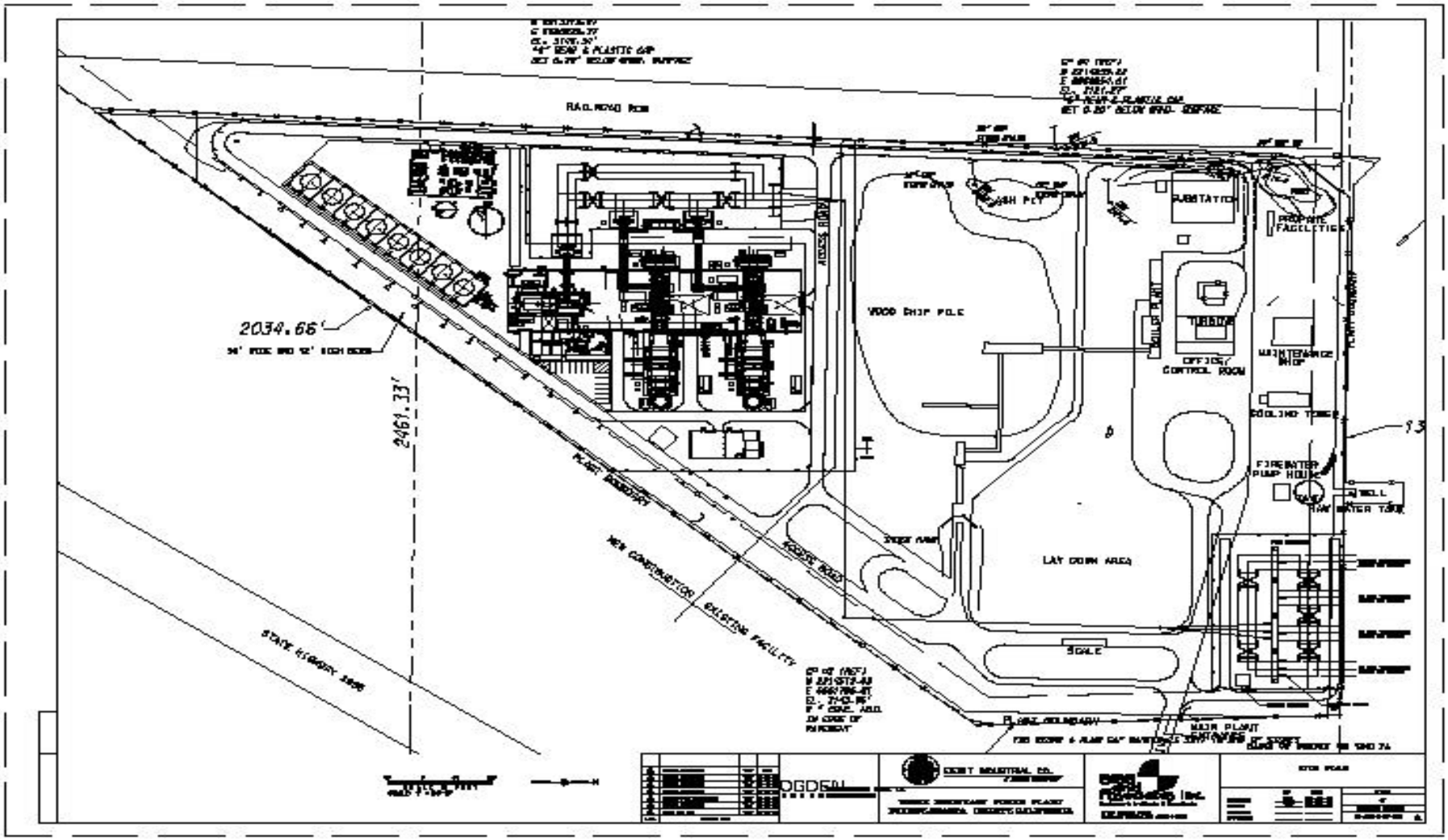
WATER SUPPLY

In the applicant's January 7, 2000 comments on the Preliminary Staff Assessment (PSA) the applicant amended its proposal to identify that water will be supplied to the project by either the Burney Water District or from wells constructed and operated by the applicant. If the Burney Water District supplies the water, it will construct a new 4,700 foot 24-inch pipeline from the new wells to the project site, and construct approximately 3,000 feet of new 14-inch inch pipeline to connect new wells to the Burney Water District storage tank. In the alternative, if the applicant cannot reach an agreement with the Burney Water District, the applicant will drill its own wells in the same location as the proposed Burney Water District wells. The applicant will also construct a new 4,700 foot 24-inch pipeline from the new wells to the project site to provide 3,500 acre-feet of water per year. The proposed water lines are shown on **PROJECT DESCRIPTION** Figure 2. Location of the wells and the water supply for the project are discussed in the **Soil and Water Resources** section of this FSA.

WASTE WATER TREATMENT

Process wastewater will be processed and reused. Most cooling water will be consumed in the cooling towers and evaporated. Chemicals and solid material contained in the cooling water will be concentrated as water is evaporated. A portion of the circulating cooling water is removed from the system to limit the concentration of chemicals in the water (e.g., blowdown). The applicant is currently proposing to dispose of waste water blowdown in percolation ponds to be located west of the project site, across the railroad tracks (see **PROJECT DESCRIPTION** Figure 2). Whether this proposal will comply with applicable regulations and

PROJECT DESCRIPTION Figure 3
Project Layout



whether it will result in significant impacts are discussed in the **Soil and Water Resources** section of this FSA.

NATURAL GAS PIPELINE

Natural gas will be supplied to the project via a new 2,500 to 7,000 foot 12-inch pipeline connection with Pacific Gas and Electric Company's (PG&E) natural gas pipeline located southeast of the project site. The applicant has identified three alternative routes for the natural gas pipeline connection. The applicant's September 2, 1999 response to staff's data request 16 indicated that route A will be used. This route calls for a 2,900 foot connection. The proposed gas line routes are show on **PROJECT DESCRIPTION** Figure 2.

TRANSMISSION LINE FACILITIES

The project will connect to PG&E's 230 kilovolt (kV) network adjacent to the existing McCloud River Railway right-of-way utilizing a new PG&E 230 kV switchyard via two new double circuit 230 kV lines and a new 230 kV single circuit transmission line from the TMPP switchyard to the PG&E switchyard (TMP 1999a, AFC pages 2-1, 2-65, Figure 3). See **PROJECT DESCRIPTION** Figure 3 for location of switchyard and new transmission line. **PROJECT DESCRIPTION** Figure 4 shows the typical double circuit 230 kv steel poles proposed.

A new PG&E switchyard will be located on the project site. The line connecting the TMPP facility to PG&E's switchyard will be a 230 kV single circuit transmission line. The tie-in with the existing PG&E 230 kV Pit River hydro transmission line is approximately 800 feet west and then 1800 feet in a northerly direction adjacent to the McCloud River Railroad easement. The Pit #1-Pit #3 230 kV transmission circuit and the Pit #1-Cottonwood 230 kV transmission circuit will be intersected and looped to the new PG&E switchyard. To accommodate the TMPP power output, 60 lineal miles of reconductoring[1] utilizing existing towers to the Round Mountain and Cottonwood substations is proposed. These transmission lines are shown on **PROJECT DESCRIPTION** Figure 1.

CONSTRUCTION

The project is estimated to have a capital cost of about $250 million. The applicant plans to complete construction and start operation of the TMPP by the second quarter of 2002. During construction, an average of approximately 200 workers would be employed. During operation, the TMPP would employ 20 to 25 full-time staff. Construction is expected to require 18 months. See the **Socioeconomic** section of this staff assessment for additional details on project construction of schedule and the work force necessary to support this project. See the **Waste Management** section of this staff assessment for discussion of disposal of wastes generated during construction. The overall sequence of construction and start-up includes: site preparation, construction foundations, erecting major structures, installing major equipment, connecting major site interfaces (pipelines and transmission line), start-up testing, and final siting cleanup and landscaping.

[1] "Reconductoring" consists of removing the old insulators, installing new insulators and replacing the old conductors with new conductors with a higher capacity.

PROJECT DESCRIPTION Figure 4
Typical Double Circuit 230 kV Steel Pole

NEED CONFORMANCE

Dick Ratliff

The Three Mountain Power Application for Certification was accepted on June 23, 1999. Currently, the Public Resources Code prohibits the Energy Commission from certifying a powerplant unless the Commission makes a finding that the facility is "needed" in accordance with the Commission's integrated assessment of the need for new resource additions. (*See,* Pub. Resources Code §§ 25523(f) and 25524(a).) The Public Resources Code directs the Commission to do an "integrated assessment of need," taking into account 5- and 12-year forecasts of electricity supply and demand, as well as various competing interests, and to adopt the assessment in a biennial electricity report.

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

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

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

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

PUBLIC HEALTH

Testimony of Obed Odoemelam

INTRODUCTION

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

The exposure of primary concern in this section is to pollutants for which no air quality standards have been established. These are known as noncriteria pollutants, or toxic air pollutants. Those for which ambient air quality standards have been established are known as criteria pollutants. These criteria pollutants are identified in this section (along with regulations for their control) because of their usually significant contribution to the total pollutant exposure in any given area. Furthermore, the same control technologies may be effective for controlling both types of pollutants when emitted from the same source. Compliance with the required control technologies will be discussed in the **Air Quality** section. When a project is proposed for an area with existing violations of any of the air quality standards, the health impacts of the criteria pollutant in question would be addressed in this Public Health section to assess the need for mitigation.

LAWS ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

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

STATE

California Health and Safety Code section 39606 requires the California Air Resources Board (ARB) to establish California's ambient air quality standards to reflect the California-specific conditions that influence its air quality. Such standards have been established by the ARB for ozone, carbon monoxide, sulfur dioxide, PM10, lead, hydrogen sulfide, vinyl chloride and nitrogen dioxide. The same biological mechanisms underlie some of the health effects of most of these criteria

pollutants as well as the noncriteria pollutants. The California standards are listed together with the corresponding federal standards in the **Air Quality** section.

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

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

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

LOCAL

The Shasta County Air Quality Management District (District) has no specific rules implementing Health and Safety Code section 44300. It does, however, require the results of a health risk assessment as part of the application for the Determination of Compliance. TMPP has complied with this requirement.

SETTING

According to information from Three Mountain Power, LLC (the applicant), (TMPP 1999a pages 1-8,and 6.9-1,) the proposed facility will be located within a 40-acre site surrounded by land zoned for industrial use, rural residential use and timberland. This location is 1 mile away from the town of Burney in Shasta County, with a population of 3,500. The nearest residence to the site is approximately 1,400 feet away. The air quality in the Burney area is considered good since its air pollutant levels do not exceed federal air quality standards. However, as noted in

the Air Quality section, the area sometimes exceeds the state's PM10 standards in the winter months mainly because of the use of wood-burning stoves and fire places. While it is appropriate to continue including the area's industrial sources in the search for solutions to the area's PM10 problem, staff considers a district-wide control program with respect to wood stove and fire place emissions, to be as significant as these industrial sources to the effort to minimize the areas PM10 problem. The requirement for pre-and post-certification PM10 monitoring by the applicant as noted in the Air Quality section, should help establish how best to minimize the problem as related to all major sources in the area. While a basin-control program would be significant to future control efforts, staff considers it necessary to require TMPP-specific reduction measure to avoid any further exacerbation of the existing problem. The details of such mitigation will be presented in the Air Quality section of the Final Staff Assessment (FSA) after the Determination of Compliance (DOC) is provided by the Air District to the Energy Commission.

The applicant has provided a listing of locations with sensitive receptors such as children and the elderly, within a 6-mile radius from the facility (TMPP 1999a page 6.9-11). These sensitive receptors are usually more susceptible than the general population to the effects of environmental pollutants. Extra consideration is given to possible effects in these individuals in establishing exposure limits for environmental pollutants. Most of the area to be impacted by the project's pollutants is timberland.

METHOD OF ANALYSIS

Any noncriteria pollutant-related impacts from this type of project would be mainly associated their emissions from the combustion turbines, ammonia from the selective catalytic reduction (SCR) system, and toxic chemicals from the cooling towers. For criteria pollutants, the impacts of most significance would result from their emissions from the turbines. Potential public exposure to the surrounding population is estimated through air dispersion modeling. After estimating the exposure levels, staff assesses whether these exposure estimates are below the applicable air quality standards or reference exposure levels in the case of noncancer effects. For cancer-causing (or carcinogenic) pollutants, such assessment is made in terms of the potential for exposure at levels whose related cancer risks are considered significant by regulatory agencies. The procedure for evaluating the potential for these cancer and noncancer health effects is known as a health risk assessment process and consists of the following steps:

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

HEALTH EFFECTS ASSESSED

Health risks associated with a project can result from high-level exposure, which creates immediate-onset (acute) effects, or from prolonged low-level exposure, which creates chronic effects. Since noncancer effects are assumed to result after exposure above specific thresholds, an analysis of the potential for these effects will include, where possible consideration of background or ambient levels of the toxic pollutants being assessed. Unfortunately, such background measurements are not usually available for the noncriteria pollutants associated with natural gas combustion unless there are major sources in the area. Such pollutants are generally emitted at relatively low levels as compared to the criteria pollutants normally encountered at significantly higher background levels, which are measured and considered in project assessments. Given the area's compliance with all federal air quality standards (with the noted exception of the state's PM10 standard), staff does not expect the noncriteria pollutants to be encountered at significant background levels in the project area. Therefore, staff will assess the potential impacts of the project's s toxic emissions only in terms of their direct emission levels without requiring measurements of background levels. The potential for significant PM10 impacts will also be assessed.

For natural gas-burning facilities such as the proposed TMPP, high-level exposure to toxic pollutants (which could cause acute effects), could occur only during major accidents and are not expected from routine operations when emissions are much lower. For criteria pollutants (such as PM10 in the case) which may be encountered at background levels high enough to violate their air quality standards, acute health impacts could result from any additions from the project. Long-term exposures could lead to chronic effects against which the ambient air quality standard was established. Since acute impacts are not expected from exposure to the noncriteria pollutants from TMPP and similar sources, effects of long-term, exposures are of greater concern than short-term effects in assessing the potential for public health impacts. Chronic effects from noncriteria pollutant exposures may be related to cancer or health effects other than cancer. Only noncancer effects are expected from the similarly chronic exposures to the criteria pollutants.

The method used by regulatory agencies to assess the significance of noncancer health effects of criteria and noncriteria pollutants is known as the hazard index method and is used to assess both acute and chronic effects. In this method, a hazard index is calculated for the individual noncriteria pollutants by dividing projected exposure by the reference level for that pollutant. For the criteria pollutant, this hazard index value is obtained by dividing exposure levels by the applicable air quality standard. A hazard index of 1.0 or less suggests that acute or chronic effects would be unlikely. A value of more than 1.0 would point to the possibility of effects, but given the conservatism in the derivation process, is not regarded as evidence that such effects would occur. The indices for all pollutants are then added together to obtain an aggregate hazard index value for the project in question. A total index of 1.0 or less indicates a lack of potential effects from all pollutant exposures considered together. As with the individual pollutants, a value of more than 1.0 indicates that a more refined analysis is required to determine whether the project may pose an actual health risk, which might require mitigation.

POTENTIAL CANCER RISK

Cancer from carcinogenic exposure usually results from biological effects at the molecular level. Since such effects are currently assumed possible from every exposure to a carcinogen, the risk of cancer is generally considered by staff and other regulatory agencies as more sensitive than the risk of noncancer health effects, for assessing the environmental acceptability of a source of both carcinogens and noncarcinogens. This accounts for the prominence of theoretical cancer risk estimates in the environmental risk assessment process. For any source of concern, the potential risk of cancer is obtained by multiplying the exposure estimate by the potency values for the individual carcinogens involved. The total project-related cancer risk is then obtained by adding together the risk values obtained for each of the individual carcinogens. This assessment process allows for calculation of only the upper bounds on the cancer risk. The actual risk will likely be lower and could indeed be zero.

STAFF'S SIGNIFICANCE CRITERIA

Various state and federal agencies specify different cancer risk levels as levels of significance with regard to specific sources. For example, a risk of 10 in a million is considered under the Air Toxics "Hot Spots" (AB 2588) and the Proposition 65 programs as significant, and therefore, used as a threshold for public notification in cases of air toxics emissions from existing sources. For sources in California, all these risk values are calculated using the conservative guidelines in the previously noted CAPCOA guidelines. The Energy Commission staff considers a potential cancer risk of one in a million as the de minimis level, which is the level below which the related exposure is negligible, meaning that project operation is not expected to result in any increase in cancer. Above this level, further mitigation could be recommended after proper consideration of issues related to the limitations of the assessment process. For noncarcinogenic pollutants, staff will consider significant health impacts unlikely when the hazard index estimate is 1.0 or less. If more than 1.0, staff would regard the related emissions as potentially significant from an environmental health perspective.

IMPACTS

PROJECT SPECIFIC IMPACTS

CONSTRUCTION PHASE IMPACTS

Potential risks to public health during construction may be associated with toxic substances disturbed during site preparation, and emissions from heavy equipment as noted for the project (TMPP 1999a pages 6.9-5). Potential impacts from emission of criteria pollutants from heavy equipment operation and particulates from site preparation are assessed in staff's **Air Quality** section in connection with the applicable air quality standards. That section also addresses compliance with applicable emission-limiting District rules together with the requisite conditions of certification. Since no hazardous substances were identified from the Environmental Site Assessment for the project (TMPP 1999a page 6.12-1), no

significant pollutant-related public health impacts are anticipated from the relatively short-term construction-related earth moving activities involved. Effects from chronic exposures are usually not expected from these short-term activities.

DIRECT OPERATIONAL IMPACTS

Three Mountain Power conducted the health risk assessment for the project-related emissions of potential significance according to procedures specified in the 1993 California Air Pollution Control Officer's Association (CAPCOA) guidelines for sources of this type. Results of this assessment have been provided to staff, along with documentation of the assumptions used (TMPP 1999a pages 6.9-6 through 6.12-21). Such documentation was provided with regard to the following:

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

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

The following noncriteria pollutants were considered for potential to produce noncancer effects with due regard for the underlying biological mechanisms: ammonia, acetaldehyde, acrolein, benzene, 1,3 butadiene; formaldehyde, naphthalene, toluene, xylenes, propylene oxide and polycyclic aromatic hydrocarbons (PAHs). Only PM10 was considered among the criteria pollutants for the potential for impacts in the problem winter months when, as noted in the Air Quality section, violations are related to air inversions in the project area. The highest measured background concentration was specified in the Air Quality section as 91 ug/m3. The following were considered with regard to a possible cancer risk: acetaldehyde, benzene, 1,3 butadiene, formaldehyde, PAHs and propylene oxide.

A hazard index value of 0.080 was calculated for combined chronic health effects of the noncriteria pollutants for the individual at the maximum impact location approximately 2.5 miles in an unpopulated area south of the site boundary. A value of 0.0385 was calculated for combined acute health effects for an individual at the maximum impact location approximately 2.2 miles in an unpopulated area north-northwest of the facility. These values are significantly below the 1.0 significance

level suggesting that significant noncancer health effects would be unlikely during operations with respect to noncriteria pollutants. A background hazard index of 1.82 was calculated for PM10, pointing to the need to prevent further additions in the problem winter periods at issue. It is for this that specific mitigation measures will be recommended in the Air Quality section.

The highest combined cancer risk was estimated to be 0.69 in a million for an individual at the same location identified for the total hazard index for chronic effects. This risk was calculated using existing procedures, which assume that the individual will be exposed at the highest possible levels to all the carcinogenic pollutants from the project for 70 years. This risk value is much below staff's de minimis level.

In their January 10, 2000 comments on staff's PSA, the California Unions for Reliable Energy (CURE) claimed that staff did not address the potential impacts of the project's PM10 in the Air Quality Section. CURE is incorrect in this assertion. As noted in connection with the health effects normally addressed in staff's Public Health analyses, the PM10 issue was discussed in the Air Quality section in terms of (1) emission estimates, (2) the extent of the problem (3) main area sources, (4) trends in ambient concentrations (5) frequency of violations, and (6) a proposed monitoring regimen. Staff will work cooperatively with the Air District at the end of the monitoring program to establish how best to deal with the problem with respect to the proposed project and other area sources.

CURE also asserted without specific analysis that the project's cooling tower plume could create icy conditions on local roads, creating a severe safety problem. CURE based this assertion on discussions with local residents who, according to CURE, stated that other cooling tower plumes in the area appear to contribute to road icing in the area. We do not believe that the project would contribute significantly to any such impacts and note that its cooling towers are proposed for operation using drift eliminators with a design efficiency of 0.0006 percent (TMPG1999a, page 6.8-25). This should serve to limit the amount of project water available for any area road icing.

In their January 10, 2000 comments on staff PSA, the Burney Resource Group expressed concern about potential public exposure to chlorination by-products (trihalomethanes, THMs) from the cooling tower, some of which they correctly identifies as carcinogens. However, THMs are formed only in waters with significant levels of organic matter, unlike the well water to be used for the proposed project. This absence of organic matter is reflected in the representative water quality data provided for the project (TMPP 1999a, page 6.14-3). Therefore, staff does not believe that THM exposure from the project's cooling towers would pose a significant health hazard in the area.

MULATIVE IMPACTS

When toxic pollutants are emitted from multiple sources within a given area, the cumulative, or additive, impacts of such emissions could, in concept, lead to significant health impacts within the population, even when such pollutants are

emitted at insignificant levels from the individual sources involved. Analyses of such emissions have shown, however, that the peak impacts of such toxic pollutants are normally localized within relatively short distances from the source. Toxic pollutant emission levels beyond the point of maximum impact normally fall within existing ambient background levels. Potentially significant cumulative impacts are only expected in situations where new sources are located adjacent to one other. Since no significant pollutant sources are presently proposed for the TMPP's impact area, no exposures of a cumulative nature are expected for the project area.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff has determined that the construction and operation of the proposed natural gas-burning project will not pose a significant public health risk to the surrounding population with regard to the toxic pollutants considered. However PM10 levels are encountered during winter months at background levels capable of significant health impacts, pointing to the need to mitigate any project-related PM10-additions to the ambient levels.

RECOMMENDATIONS

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

REFERENCES

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

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

Three Mountain Power Project (TMPP) 1999a. Application for Certification (99-AFC-2). Submitted to the California Energy Commission, March 3, 1999.

WORKER SAFETY AND FIRE PROTECTION

Chris Tooker

INTRODUCTION

Industrial workers use process equipment and hazardous materials on a daily basis. Accidents involving relatively small amounts of material can result in serious injuries to workers. Worker protection measures can include special training, protective equipment and procedural controls. The employer must also comply with applicable laws, ordinances, regulations and standards (LORS) to protect workers. This Worker Safety and Fire Protection analysis assesses the completeness and adequacy of the measures proposed for the Three Mountain Power Project (TMPP) by the applicant, Three Mountain Power, LLC, to comply with applicable health and safety standards and other reasonable requirements (Title 20, California Code Regulations, section 1743); and draws conclusions about the compliance of the proposed project with applicable LORS (Title 20, California Code Regulations, section 1744). These standards are designed to protect the health and safety of workers during construction and operation of the facility, and to establish adequate fire protection and emergency response procedures.

Staff has reviewed the TMPP Application for Certification (AFC) to determine whether the applicant has proposed adequate measures to:

- comply with all applicable LORS;
- protect the workers during construction and operation of the facility;
- protect against fire; and
- provide adequate emergency response procedures.

Unless features of the project present unusual industrial safety or fire protection problems, staff believes that compliance with applicable LORS will be sufficient to ensure worker safety and fire protection, and provide adequate emergency response procedures.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Occupational Safety and Health Act of 1970 (29 United States Code sections 651 et seq.).

Occupational Safety and Health Administration Safety and Health regulations (29 Code of Federal Regulations §§ 1910.1 - 1910.1500)

Occupational Safety and Health Act of 1970 (29 United States Code section (USC) (§) 651 et seq.).

29 C.F.R. §1910.120 (HAZWOPER Standard) Defines the regulations for Hazardous Waste Operations and Emergency Response. This section covers the clean-up operations, hazardous materials removal work, corrective actions, voluntary clean-up operations, monitoring, and emergency response required by federal, state, and local agencies of hazardous substances that are present at controlled and uncontrolled hazardous waste sites.

29 C.F.R. §§1910.1 - 1910.1500 (Occupational Safety and Health Administration Safety and Health regulations)

29 C.F.R. §§1952.170 - 1952.175 (Approval of California's plan for enforcement of its own Safety and Health requirements, in lieu of most of the federal requirements found in §§ 1910.1 - 1910.1500)

STATE

California's plan for enforcement of its own Safety and Health requirements is in lieu of most of the federal requirements found in 29 CFR §§ 1952.170 - 1952.175.

- Title 8, California Code of Regulations (CCR), section 450 et seq. (Applicable requirements of the Division of Industrial Safety, including Unfired Pressure Vessel Safety Orders, Construction Safety Orders, Electrical Safety Orders, and General Industry Safety Orders).
- California Building Code, Title 24, CCR, § 501 et seq. The California Building Code is designed to provide minimum standards to safeguard human life, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, etc. of buildings and structures.
- Title 8, CCR, § 5192 (HAZWOPER Standard). Defines the regulations for Hazardous Waste Operations and Emergency Response. This section covers the clean-up operations, hazardous removal work, corrective actions, voluntary clean-up operations, monitoring, and emergency response required by federal, state, local agencies of hazardous substances that are present at controlled and uncontrolled hazardous waste sites.

LOCAL

1998 Edition of California Fire Code (CFC) and all applicable National Fire Protection Association (NFPA) standards. The fire code contains provisions necessary for fire prevention and information about fire safety, special occupancy uses, special processes, and explosive, flammable, combustible and hazardous materials.

Uniform Fire Code Standards. This is a companion publication to the CFC and contains standards of the American Society for Testing and Materials and of the National Fire Protection Association.

California Building Code. (Cal. Code Regs., Tit. 24, § 501 et seq.) The California Building Code is designed to provide minimum standards to safeguard human life,

health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, etc. of buildings and structures.

SETTING

The TMPP is proposed to be located about one mile northeast of the town of Burney in Shasta County, approximately 45 miles northeast of Redding. For a complete description of the 10 acre site and the proposed combined cycle power plant, refer to the **Project Description** section of this FSA and the AFC, Vol. 1 (TMPP, 1999a). The two fire departments that will provide services for the proposed project are the Burney Fire Protection District (District), and the Shasta County Fire Department, which is administered by the California Division of Forestry (CDF). The District will be the first responder to structural fires associated with the power plant and related electric transmission and gas pipelines. Its closest station in Burney has a 5 to 10 minute response time to the proposed facility location. The District has three full-time firefighters and from 20 to 25 volunteer firefighters; five fire fighting engines, with pumping capacities ranging from 400 to 1,250 gallons per minute, and can call for support from surrounding fire departments (TMPP, 1999b). The District's extension ladders are, however, limited to thirty-five feet, which are inadequate for reaching the upper levels of the proposed facilities (Sullivan 1999).

During the fire season from May through October the CDF's staff and equipment is located in Johnson Park, just east of Burney, and is responsible for responding to wildland fires that could occur in the areas adjacent to the project facilities, including the power plant site and the electric transmission line. At other times of the year, CDF will be located in Redding. The next closest fire department available to respond is the Cassel Volunteer Fire Department, located 12 miles from Burney.

IMPACTS

DIRECT IMPACTS

FIRE PROTECTION

To determine the project's impacts on fire protection, staff reviewed the information provided in the AFC regarding available fire protection services and equipment, which are intended to limit personnel injury and property loss (TMPP 1999a, Section 6.11.1.3.5, pp 6-14 to 6-16). The project will include the following fire protection components: a fire water system, including storage, piping and pumps, fire hydrants and sprinkler systems, a carbon dioxide fire protection system, fire detection sensors, and portable fire extinguishers. The applicant will be required to provide final diagrams and plans to staff and the District, prior to construction and operation of the project, to confirm the adequacy of these fire protection measures.

The TMPP will also be supported by local fire protection services, as described above. The District has evaluated the potential impacts of the proposed project on

their service capabilities. In a letter to the Commission staff, dated 11/22/99, the District has identified the need for the applicant to purchase additional equipment and provide training to District staff (Sullivan, 1999):

One ladder truck with one hundred foot platform
Training for personnel on ladder truck
Training for personnel on hazardous materials handling
Three Macaw backpacks

The one hundred-foot platform (ladder) truck would be used to reach the upper levels of the project facilities at the plant site. The backpacks would be used during small fires in the grass or in the hazardous materials storage areas.

WORKER SAFETY

As is true of most industrial work environments, workers associated with both the construction and operation of the TMPP may be exposed to numerous hazards, including chemical spills, hazardous wastes, fires, moving equipment, and electrical shocks, as described in Table 6.11-1 (p 6.11-2) of the AFC. It is important for the applicant to have well-defined policies, procedures, training, hazard recognition and control at their facility to minimize such hazards and to protect workers. The applicant has provided adequate outlines of their proposed worker safety plans that will be expanded prior to construction and operation of the project, as required by conditions of certification **SAFETY-1** and **SAFETY-2** (TMPP 1999a, Sections 6.11.1.2.1 through 6.11.1.3.4).

CUMULATIVE IMPACTS

There are no other large industrial facilities proposed to be built in the area that would contribute to impacts on the District's service capabilities. However, according to the District, three existing industrial facilities in the area require service capabilities for tall structure fires similar to those identified for the TMPP (Sullivan, 1999). Those facilities are Sierra Pacific Industries, Big Valley Lumber and Burney Forest Power.

MITIGATION

As mitigation for the impacts to fire protection services, as described above, the District and the applicant are engaged in ongoing discussions regarding the funding of the equipment and training needs identified by the District. The District also intends to request support from the existing industrial facilities to fund the equipment and training needs identified in their letter of November 22, 1999 (Sullivan, 1999). In the **Socioeconomics** section of this FSA, staff is proposing condition of certification **SOCIO- 2** to assure that the applicant provides their share of funding of the District's identified needs.

CONSTRUCTION SAFETY AND HEALTH PROGRAM

The Construction Safety Orders found in Title 8, California Code of Regulations contain health and safety requirements promulgated by California Occupational

Safety and Health Administration (Cal/OSHA) that are applicable to the construction phase of the project (CCR, tit. 8, § 1500 et seq.). The various plans required by the regulations are incorporated in the project Construction Safety and Health Program, the major elements of which include:

- Construction Injury and Illness Prevention Program (IIPP) (CCR, tit. 8, § 1509);
- Construction Fire Protection and Prevention Plan (CCR, tit. 8, § 1920);
- Personal Protective Equipment Program (CCR, tit. 8, §§ 1514 - 1522; and §§ 3401 - 3411).

In addition, the requirements of the Electrical Safety Orders (CCR, tit. 8, and §§ 2299 - 2974) and Unfired Pressure Vessel Safety Orders (CCR, tit. 8, §§ 450 - 544) may be applicable to the project.

The applicant provided adequate outlines in the AFC for each of the above programs and plans (TMPP 1999, Sections 6.11.1.2 through 6.11.1.2.4). Prior to construction of the facility the applicant will provide detailed programs and plans in accordance with condition of certification **SAFETY-1**.

OPERATION SAFETY AND HEALTH PROGRAM

During the operation phase of the project, many Electrical Safety Orders (CCR, tit. 8, and §§-2299 - 2974) and Unfired Pressure Vessel Safety Orders (CCR, tit. 8, §§ 450 - 544) will be applicable. In addition, the Division of Industrial Safety has promulgated regulations applicable solely to operations. These are contained in the General Industry Safety Orders (CCR, tit. 8, § 3200 et seq.). The applicant will incorporate these requirements into its Operation Safety and Health Program, the major elements of which include:

- Injury and Illness Prevention Program (CCR, tit. 8, § 3203)
- Emergency Action Plan (CCR, tit. 8, § 3220)
- Fire Prevention Plan (CCR, tit. 8, § 3221)
- Personal Protective Equipment Program (CCR, tit. 8, §§ 3401 - 3411)

The applicant provided adequate outlines for each of the programs and plans in the AFC (TMPP 1999, Sections 6.11.1.3 through 6.11.1.3.4) and will provide detailed programs and plans in accordance with condition of certification **SAFETY-2**.

SAFETY AND HEALTH PROGRAM ELEMENTS

The applicant has provided proposed outlines for both a Construction Safety and Health Program and an Operation Safety and Health Program (TMPP 1999a, Sections 6.11.1.2 and 6.11.1.3). Both programs will cover the TMPP, including any aspect of the transmission lines and pipelines under the applicant's control. 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

The applicant has provided an adequate draft outline for an Injury and Illness Prevention Program (IIPP). The applicant will need to submit an expanded Injury and Illness Prevention Program to Cal/OSHA for review and comment 30 days prior to both construction and operation of the project.

Cal/OSHA will review and provide comments on the IIPP as the result of an on-site consultation at the request of the applicant. During the consultation a Cal/OSHA representative will complete a physical survey of the site, analyze the work practices, and point out those practices that are likely to result in illness or injury. The on-site consultation will give Cal/OSHA an opportunity to evaluate the TMPP IIPP and apply it directly to activities taking place on-site.

EMERGENCY ACTION PLAN

Title 8, California Code of Regulations, section 3220 requires an Emergency Action Plan. The AFC contains a satisfactory outline for an emergency action plan, including fire and emergency reporting procedures, evacuation procedures, and a Spill Prevention/Control and Countermeasure Plan. Staff proposes condition of certification **SAFETY-2**, which requires the applicant to submit a final Operation's Emergency Action Plan to Cal/OSHA, for review and comment, after an on-site consultation.

FIRE PROTECTION PLAN

Title 8, California Code of Regulations, section 3221 requires a Fire Protection Plan. The AFC contains an outline of a fire protection and prevention plan that is adequate for staff's analysis. The outline includes the appropriate components, including, training, fire control and emergency response, alarm systems, fire fighting equipment, and materials storage and disposal procedures.

Staff proposes that the applicant submit a Construction Fire Protection and Prevention Plan and an Operation Fire Protection Plan to the California Energy Commission Compliance Project Manager (CPM) and the District for review and acceptance to satisfy proposed conditions of certification **SAFETY-1 and 2**.

PERSONAL PROTECTIVE EQUIPMENT PROGRAM

The purpose of the Personal Protective Equipment Program is to ensure that employers comply with applicable requirements for the provision and use of Personal Protective Equipment (PPE), and to provide employees with the information and training necessary to carry out the program. The applicant has provided a satisfactory outline that identifies minimum requirements of a proposed PPE program.

Under Title 8, California Code Regulations, sections 3380 - 3400, personal protective equipment will be required whenever hazards are encountered which, due to process, environment, chemicals, or mechanical irritants, can cause injury or impairment of body function as a result of absorption, inhalation, or physical contact.

The project's operational environment will create potential situations where personal protective equipment is required.

The TMPP PPE Program should include a written policy on: the use of protective equipment (and methods of communicating the information to the employees), selection of the proper type of equipment, training of employees on the correct use and maintenance of the equipment, enforcement of personal protective equipment use, and the use of devices that provide respiratory protection, hearing conservation, eye protection and head protection.

Staff believes that if the applicant develops and carries out a PPE program similar to the format and elements listed above, the program will meet applicable regulations and will significantly reduce the potential for adverse impacts to workers.

General Safety

Besides the specific plans listed above, there are other requirements, some of which are called "safe work practices," imposed by various worker safety LORS applicable to this project. For the sake of clarity, staff has grouped these requirements as follows:

Lighting

American National Standards Practice for Industrial Lighting, ANSI/IES-RP-7, contains requirements to protect workers from inadequate lighting. Insufficient light leads to errors and sometimes accidents. An error may result from not seeing a situation that is dangerous and not being able to react quickly enough. The **Visual Resources** section of this PSA provides further detail concerning off-site consequences and performance requirements for exterior lighting.

Hazardous Materials Releases

Staff's analysis considered the system design and administrative procedures proposed to reduce the likelihood of an accidental release of acutely hazardous materials that could affect workers. See the **Hazardous Materials** section of this PSA for more detail.

Smoking

The applicant shall not allow smoking in areas designated in the National Electrical Code (NEC) as Class I, Divisions 1 and 2. These locations are areas where ignitable concentrations of flammable gases or vapors exist or where volatile flammable liquids or flammable gases are handled, processed, or used. Signs restricting smoking in these areas of the project site will be posted to protect the facility and workers.

Lock-out/Tag-out

Title 8, California Code of Regulations, sections 2320.4, 2320.5, 2320.6, 2530.43, 2530.86, 3314, and 6003 identify required lock-out and tag-out safety practices and programs which reduce employee exposure to moving equipment, electrical shock, and hazardous and toxic materials. Lock-out is the placement of a padlock, blank

flange, or similar device on equipment to ensure that it will not be operated until the lock-out device is removed. Tag-out is the use of warning signs that caution personnel that equipment cannot be energized until the lock-out device is removed. Warning signs can also be used to alert employees about the presence of hazardous and toxic materials. The applicant's lock-out/tag-out program should include steps for applying locks and tags, steps for removing locks and tags, and employee training on lock-out/tag-out procedures.

Confined Spaces Entry Program

Title 8, California Code of Regulations, Sections 5156 - 5159 identifies the minimal standards for preventing employee exposure to dangerous air contaminants and/or oxygen deficiency in confined spaces. A confined space is any space that limits the means of egress, is subject to toxic or flammable contaminants, or has an oxygen-deficient atmosphere. Examples of confined spaces are silos, tanks, vats, vessels, boilers, compartments, ducts, sewers, pipelines, vaults, bins and pits. TMPP shall take the following steps to ensure worker safety during work in confined spaces.

Before entering a confined space, site personnel will evacuate or purge the space and will shut off lines that provide access for substances into the space. The air in the vessels will be tested for oxygen deficiency, and the presence of both toxic and explosive gases and vapors will be evaluated before entry into the confined space is allowed. Lifelines or safety harnesses will be worn by anyone entering the confined space, and a person will be stationed outside in a position to handle the line and to summon assistance in case of emergency. Appropriate respirators will be available whenever hazardous conditions may occur.

Hot Work

Hot work is any type of work that causes a spark and can ignite a fuel source. Examples include welding, cutting and brazing. Before proceeding with hot work, workers will need to get a work authorization from the project's assigned Safety Officer. The control operator, together with the shift supervisor, will decide whether hot work is required on a job and if a work authorization will be required. Before hot work is undertaken, the area will be inspected, the job shall be posted and, depending on what is located in the area, additional safeguards may be implemented.

FACILITY CLOSURE

The project owner/operator is responsible for maintaining an operational fire protection system during closure activities. The project must also stay in compliance with all applicable health and safety LORS during that time.

CONCLUSION AND RECOMMENDATIONS

CONCLUSIONS

If the applicant provides a Construction Safety and Health Plan, and an Operation Safety and Health Plan, as required by conditions of certification **SAFETY-1** and **2**; and provides the funding required by Conditions of Certification **SOCIO-2**, staff believes that the project will incorporate sufficient measures to ensure adequate levels of industrial safety and fire protection, and comply with applicable LORS.

RECOMMENDATIONS

If the Energy Commission certifies the project, staff recommends that the Energy Commission adopt the following proposed conditions of certification. The proposed conditions of certification provide assurance that the Project Construction and Operation Safety and Health Programs proposed by the applicant will be reviewed by the appropriate agencies before implementation. The conditions also require verification that the proposed plans adequately assure worker safety and fire protection and comply with applicable LORS.

PROPOSED CONDITIONS OF CERTIFICATION

SAFETY-1 The project owner shall submit to the CPM a Project Construction Safety and Health Program, which shall include:

- A Construction Injury and Illness Prevention Program.
- A Construction Fire Protection and Prevention Plan.
- A Personal Protective Equipment Program.

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

The Construction Fire Protection and Prevention Plan shall be submitted to the Burney Fire Protection District for review and acceptance.

Verification: Thirty days prior to the start of construction, or a lesser period of time as mutually agreed to by the project owner and the CPM, the project owner shall submit to the CPM a copy of the Project Construction Safety and Health Program and the Personal Protective Equipment Program, with a copy of the cover letter of transmittal of the plan to CAL-OSHA. The project owner shall provide a letter from the Burney Fire Protection District stating that they have reviewed and accept the Construction Fire Protection and Prevention Plan.

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

- An Operation Injury and Illness Prevention Plan.
- An Emergency Action Plan.
- An Operation Fire Protection Plan.
- A Personal Protective Equipment Program.

Protocol: The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the Cal/OSHA Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders.

The Operation Fire Protection Plan and the Emergency Action Plan shall be submitted to the Burney Fire Protection District for review and acceptance.

Verification: At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the final version of the Project Operation Safety & Health Program. It shall incorporate Cal/OSHA's Consultation Service comments, stating that they have reviewed and accepted the specified elements of the proposed Operation Safety and Health Plan.

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

SAFETY-3 The project owner shall design and install all exterior lighting to meet the requirements contained in the Visual Resources conditions of certification and in accordance with the American National Standards Practice for Industrial Lighting, ANSI/IES-RP-7.

Verification: Within 60 days after construction is completed, the project owner shall submit a statement to the CPM that the illuminance levels contained in ANSI/IES RP-7 were used as a basis for the design and installation of the exterior lighting.

REFERENCES

Cal/OSHA Consultation. 1990. Cal/OSHA Consultation Pamphlet.

Sullivan, L. 1999. Fire Chief, Burney Fire Protection District. Meeting with James Adams, November 4, 1999; Letter to James Adams, California Energy Commission, November 22, 1999.

TMPP (Three Mountain Power Project/McFadden) 1999a. Submittal of the Application for Certification, Three Mountain Power Project, (99-AFC-2). Submitted to the California Energy Commission, March 3, 1999.

TMPP (Three Mountain Power Project/McFadden) 1999b. Submittal of responses to staff data requests 2 - 9 and 13 – 43. Submitted to the California Energy Commission, September 2, 1999.

TRANSMISSION LINE SAFETY AND NUISANCE

Obed Odoemelam

INTRODUCTION

The transmission line for the proposed Three Mountain Power Project (TMPP) is a single-circuit 230 kV line connecting the project's switchyard to a new 230 kV PG&E switchyard adjacent to the project. This connecting line will be approximately 1300 feet long. From the new PG&E switchyard, the generated power will be transmitted to the existing PG&E power grid through two double-circuit 230 kV lines approximately 2,600 feet long. These two lines and the new PG&E switchyard will be built to PG&E standards and operated by PG&E. The project's switchyard will be built and operated by the applicant, Three Mountain Power. To transmit the generated power safely, PG&E will need to reconductor a total of 88 miles of specific segments within its two existing 230 kV transmission lines running from Burney to the Cottonwood Substation, via Round Mountain (TMPP 1999b pages 2-70 and 2-74). Such reconductoring will be done within existing rights-of-way without tower replacements. It will be done according to existing PG&E design guidelines and construction practices reflecting compliance with applicable laws ordinances regulations and standards (LORS). The purpose of this analysis is to assess the proposed construction and operation of the project-specific and PGE-operated segments for appropriate incorporation of the design measures necessary for compliance with applicable LORS as noted by the applicant (TMPP 1999a pages 7-5 through 7-14). If compliance is established, staff will recommend approval; if not, staff will recommend revisions as appropriate. Both the project-specific and the PG&E-operated sections will be considered one in assessing the line-related impacts of the proposed project.

Staff's analysis will focus on the issues noted below which relate primarily to the physical presence of the line, or secondarily to the physical interactions of line electric and magnetic fields.

- Aviation safety;
- Interference with radio-frequency communication;
- Audible noise;
- Fire hazards;
- Hazardous shocks;
- Nuisance shocks; and
- Electric and magnetic field (EMF) exposure.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Discussed below by subject area are design-related LORS applicable to the physical impacts of transmission lines as proposed for TMPP. The impacts of concern are addressed through specific federal or state regulations or through

established industry standards and practices. There presently are no local laws or regulations specifically aimed at the physical structure or dimensions of electric power lines to limit the impacts noted above.

AVIATION SAFETY

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

FEDERAL

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

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

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

FEDERAL

- Federal Communications Commission (FCC) regulations in Title 47 CFR, Section 15.25. Provisions of these regulations prohibit operation of any devices producing force fields, which interfere with radio communications, even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. Such interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as corona discharge but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and

insulators or metal fittings. When generated, such noise manifests as perceivable interference with radio or television signal reception or interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. Staff usually recommends specific conditions of certification to ensure compliance with this FCC requirement.

STATE

- General Order 52 (GO-52), California Public Utilities Commission (CPUC). Provisions of this order govern the construction and operation of power and communications lines and specifically deal with measures to prevent or mitigate inductive interference. Such interference is produced by the electric field induced by the line in the antenna of a radio signal receiver.

Several design and maintenance options are available for minimizing these electric field-related impacts. When incorporated in the line design and operation, such measures also serve to reduce the line-related audible noise discussed below.

AUDIBLE NOISE

FEDERAL

There are no design-specific federal regulations to limit the audible noise from transmission lines. As with radio noise, such noise is limited instead through design and maintenance standards established from industry research and experience as effective without significant impacts on line safety, efficiency maintainability and reliability. All high-voltage lines are designed to assure compliance. Such noise usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying or hissing sound or hum. Since (as with communications interference), the noise level depends on the strength of the line electric field, the potential for occurrence can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during wet weather and from lines of 345 kV or higher. It is, therefore, not generally expected at significant levels from lines of less than 345 kV such as the one proposed for TMPP. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a 100-ft right-of-way.

NUISANCE SHOCKS

FEDERAL

There are no design-specific federal regulations to limit nuisance shocks in the transmission line environment. For modern high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). Nuisance shocks are caused by current flow at levels generally incapable of causing significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line electric and magnetic fields. As with lines of the type proposed, the applicant will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff usually recommends specific conditions of certification to ensure that such grounding is made within the right-of-way by both the applicant and property owners.

FIRE HAZARDS

The fire hazards addressed through the following regulations are those that could be caused by sparks from conductors of overhead lines or that could result from direct contact between the line and nearby trees and other combustible objects.

STATE

- General Order 95 (GO-95), CPUC, “Rules for Overhead Electric Line Construction”. This order specifies tree-trimming criteria to minimize the potential for power line-related fires.

- Title 14 Section 1250 of the California Code of Regulations, “Fire Prevention Standards for Electric Utilities”. This code specifies utility-related measures for fire prevention.

HAZARDOUS SHOCKS

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

FEDERAL

There are no design-specific federal regulations to prevent hazardous shocks from power lines. Safety is assured through compliance with the requirements in the National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines. These provisions specify the minimum national safe operating clearances applicable in areas where the line might be accessible to the public. They are intended to minimize the potential for direct or indirect contact with the energized line.

STATE

- GO-95, CPUC. “Rules for Overhead Line Construction”. These rules specify uniform statewide requirements for overhead line construction regarding ground clearance, grounding, maintenance and inspection. Implementing these requirements ensures the safety of the general public and line workers.

- Title 8, CCR, Section 2700 et seq., “High Voltage Electric Safety Orders”. These safety orders establish essential requirements and minimum standards for safely installing, operating, and maintaining electrical installations and equipment.

ELECTRIC AND MAGNETIC FIELD (EMF) EXPOSURE

The possibility of deleterious health effects from electric and magnetic field exposure has increased public concern in recent years about living near high-voltage lines. Both fields occur together whenever electricity flows, hence the general practice of considering both as EMF exposure. As noted by the applicant, (TMPP 1999a pages 6.9-21and 6.9-22, and 6.18-4), the available evidence as evaluated by CPUC and other regulatory agencies, has not established that such fields pose a significant health hazard to exposed humans. However, staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore considers it appropriate, in light of present uncertainty, to reduce such fields to some degree, where feasible, until the issue is better understood. The challenge has been to establish when, and how far to reduce them.

While there is considerable uncertainty about the EMF/health effects issue, the following facts have been established from the available information and have been used to establish existing policies:

- Any exposure-related health risk to the exposed individual will likely be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns relate to 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.

FEDERAL

No federal regulations have been established specifying environmental limits on the strengths of fields from power lines. However, the federal government continues to conduct and encourage research necessary for an appropriate policy on the EMF issue.

In the face of the present uncertainty, several states have opted for design-driven regulations ensuring that fields from new lines are generally similar to those from existing lines. Some states (Florida, Minnesota, New Jersey, New York, Montana) have set specific environmental limits on one or both fields in this regard. These limits are, however, not based on any specific health effects. Most regulatory agencies believe, as does staff, that health-based limits are inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

Before the present health-based concern developed, measures to reduce field effects from power line operations were mostly aimed at the electric field component, whose effects can manifest as the previously noted radio noise, audible noise and nuisance shocks. The present focus is on the magnetic field because only it can penetrate building materials to potentially produce the types of health impacts at the root of the present concern. As one focuses on the strong magnetic fields from the more visible transmission and other high-voltage power lines, staff considers it important for perspective, to note that an individual in a home could be exposed for short periods to much stronger fields while using some common household appliances (National Institute of Environmental Health Services and the U.S Department of Energy, 1995). Scientists have not established which of these types of exposures would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than the power line environment.

STATE

In California, the CPUC (which regulates the installation and operation of high-voltage lines in California) has determined that only no-cost or low-cost measures are presently justified in any effort to reduce power line fields beyond levels existing before the present health concern arose. The CPUC has further determined that such reduction should be made only in connection with new or modified lines. It required each utility within its jurisdiction to establish EMF-reducing design guidelines for all new or upgraded power lines and related facilities within their respective service areas. The CPUC further established specific limits on the resources to be used in each case for field reduction. Such limitations were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Utilities not within the jurisdiction of the CPUC voluntarily comply with these CPUC requirements. This PUC policy resulted from assessments made to implement CPUC Decision 93-11-013 of 1989.

In keeping with this CPUC policy, staff requires evidence that each proposed line will be designed according to the EMF-reducing design guidelines applicable to the utility service area involved. These field-reducing measures can impact line operation if applied without appropriate regard for environmental and other local issues bearing on safety, reliability efficiency and maintainability. It is therefore, up to each applicant to ensure that such measures are applied in ways, and to an extent, without significant impacts on line operation. The extent of such applications will be reflected by the ground-level field strengths as measured during operation. When estimated or measured for the line, such field strengths can be used by staff

and other regulatory agencies for comparison with fields of lines of similar voltage and current-carrying capacity. Such field strengths can be estimated for any given design using established procedures. Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m), for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends on line voltage (in the case of electric fields), the geometry of the structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since each new line in California is currently required to be designed according to the EMF-reducing guidelines of the utility in the service area involved, their fields are required under existing CPUC policies to be similar to fields from similar lines in that service area. A condition of certification is usually proposed by staff to ensure implementation of the reduction measures necessary.

SETTING

According to information from the applicant (TMPP 1999b, pages 2-25 and 2-26, 6.15-5 and 6.15-38), the site of the proposed power plant was chosen in part for its closeness to the two PG&E 230 kV transmission lines to which its generated power will be transmitted. These lines are identified as Pit-Vaca #s 1 and 2, lines. A 1300-foot single-circuit line will connect the project to the new PG&E Switchyard. The route of the two PG&E lines will run approximately 800 feet west along the northern project property line, then north approximately 1800 feet adjacent to the McCloud River Railroad right-of-way to the Pit-Vica #1 and #2 lines. Since staff does not consider the fields from the reconductored segments to be significant with regard to incremental human exposures, staff considers it best to assess the field-related impacts of the proposed project in terms of field levels along (a) the 1300-foot route of the project's single-circuit line to the new PG&E Switchyard and (b) the 2600-foot route of PG&E's tie-in lines from the same Switchyard to the interconnection point on the PG&E grid.

As noted by the applicant (TMPP 1999b page 2-26) the route of the proposed lines will traverse a relatively flat area of few pine trees. The distance to the nearest residence to the project or its related lines is approximately 1,400 feet (TMPP 1999b page 6-37). This means that long-term residential magnetic field exposure of the present concern would be insignificant with regard to TMPGP. The exposure of potential significance would be to line workers and any individual who may enter the area around the line.

PROJECT DESCRIPTION

According to information from the applicant (TMPP 1999b pages 2-70 and 2-71), the transmission line associated with the proposed project will be made up of the specific components listed below.

- A single circuit 230 kV overhead line extending 1300 feet from the project site to a new PG&E Switchyard

- A new 230 kV project-specific switchyard at the northeast corner of the project site
- A new PG&E 230 kV Switchyard adjacent to the project site
- Two 230 kV double circuit lines extending 2,600 feet to connect the new PG&E Switchyard to the two 230 kV lines of the PG&E power grid

The reconductored sections of the existing PG&E lines will be as follows:

- 50.5 miles of the Pit 1 Cottonwood 230 kV line
- 13 miles of the Pit 1-Pit 3 230 kV line
- 24.5 miles of the Pit 1-Round Mountain 230 kV line

The two PG&E-operated 230 kV double-circuit lines and the project-specific 230 kV single-circuit lines will be supported on single-shaft tubular steel poles. Details of these structures along with the interconnection points have been provided by the applicant (TMPP 1999b pages 2-68, 2-69 and B-16). Each structure will be erected to provide at least 30 feet of conductor-to-ground clearance. Construction and operation will be according to PG&E standards and practices (TMPP 1999b page 2-67).

IMPACTS

GENERAL IMPACTS

LORS section, GO-95 and Title 8, CCR Section 2700 et seq. provide the minimum regulatory requirements necessary to avoid the direct or indirect contact previously discussed in connection with hazardous shocks and aviation hazards. Of secondary concern are the field-related impacts manifesting as nuisance shocks, radio noise, communications interference and magnetic field exposure. The relative magnitude of such impacts would be reflected in the field strengths characteristic of a given line design. Since the field-reducing measures can affect line operations, the extent of their implementation together with related field strengths, will vary according to environmental and other local conditions bearing on line safety, efficiency, reliability and maintainability. They will therefore, vary from one service area to the other according to prevailing conditions. It would be up to each project proponent to apply such measures to the extent appropriate for the geographic area involved. The potential for all these impacts is assessed separately for each proposed project

PROJECT SPECIFIC IMPACTS

AVIATION SAFETY

The project is proposed for a location with no nearby airports (TMPP 1999b page 6.18-1). An FAA “Notice of Construction or Alteration” will not be required for the proposed power line, according to existing regulatory criteria. From its

consideration of all issues related to distance from the line and FAA safety requirements, staff is in agreement with the applicant that the proposed line will not pose a significant hazard to area aviation.

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

The previously noted corona-related communications interference is most commonly caused by irregularities (such as nicks and scrapes on the conductor surface), sharp edges on suspension hardware and other irregularities around the conductor surface. The intended use of a low-corona conductor design and construction methods (TMPP 1999, page 6.18-2 and 6.19-3) should minimize the potential for such interference which is usually of concern only for lines of 345 kV and above. No significant communications interference is expected, as with the existing 230 kV line to which the proposed line will be connected. This is as staff would expect for this type of line. The previously noted provisions of the related FCC regulations are important in requiring each project owner to ensure mitigation of any such interference to the satisfaction of the affected individual. Staff has proposed a condition of certification **(TLSN-2)** to ensure mitigation of any interference-related complaints on a case-specific basis, as required by the FCC. **TLSN-1** is also proposed by staff to ensure compliance with GO-52, also intended to prevent radio interference.

AUDIBLE NOISE

As with radio noise, the low-corona conductor intended for use for the proposed lines will minimize the potential for audible noise. This means, as noted by the applicant (TMPP 1999b page 6.18-2) that the line will not add significantly to existing background noise levels in the area. For an assessment of the noise from all phases of the proposed power plant and related facilities, please refer to staff's analysis in the **Noise** section.

FIRE HAZARDS

Adequate fire prevention and suppression measures will be implemented in the area around the proposed line as required by related regulations and industry practices (TMPP 1999a page 7-7). Compliance with G-O 95 requirements will ensure the clearance necessary to prevent fires from direct contact between the proposed line, trees and other objects. Compliance with condition of certification **TLSN-4,** as staff proposes, will prevent accumulation of combustible materials that could contribute to such fires.

HAZARDOUS SHOCKS

As noted by the applicant (TMPP 1999a page 7-7) both the project-specific and the PG&E-operated sections of the proposed line will be constructed (as is present PG&E practice) according to the requirements of GO-95 which prevent hazardous shocks from direct or indirect human contact with the overhead energized line. Therefore, staff does not expect these lines to pose any such hazards to humans and recommends condition of certification **TLSN-1** to ensure implementation of the GO-95-related measures.

NUISANCE SHOCKS

As with current PG&E practice, the potential for nuisance shocks will be minimized along the project-specific and PG&E-operated sections of the proposed line through the grounding procedures specified by the applicant (TMPP 1999a pages 6.18 through 6.18-10). Ensuring GO-95-required ground clearance as intended will minimize the potential for the electrical charging for which such grounding would be necessary. Staff recommends condition for certification **TLSN-5** to ensure the grounding necessary.

ELECTRIC AND MAGNETIC FIELD EXPOSURE

The applicant calculated the maximum field strengths along the route of the proposed line, from the project's switchyard to the interconnection points on the PG&E power grid. Results of this calculation (TMPP 1999a page 6.18-4, Appendix L, 1999b page 2-73) show a maximum electric field strength of 1.8 kV/m directly underneath the line. This is similar to fields from PG&E lines of the same voltage. The 0.348 kV/m for the edge of the right-of-way is lower than for similar PG&E lines. The maximum value for magnetic fields within the right-of-way is 92 mG. This represents the maximum levels of short-term exposures for individuals that might enter the line area, or line workers engaged in maintenance and other activities within the right-of-way. Such short-term exposures are well understood, being significantly lower than exposures from the use of common household appliances, such as hair dryers, toaster ovens, microwave ovens and electric shavers. They are not known to have produced any significant health impacts in the past. A value of 48.1 mG was calculated for the west edge of the right-of-way while 30.5 mG was calculated for the east edge. These field strength values are within the range for PG&E lines of similar voltage and current-carrying capacity. Staff has verified the accuracy of the applicant's calculations with regard to parameters bearing on field strength, dissipation, and exposure assessment. Staff has recommended condition of certification **TLSN-3** to verify that the fields are reduced to the extent proposed by the applicant.

CUMULATIVE IMPACTS

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

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Since electric or magnetic field health effects have neither been established nor ruled out for lines such as those proposed for this project, the public health significance of any project-related field exposure cannot be characterized with

certainty. The short-term exposures calculated for the proposed line are typical of similar PG&E lines. The long-term, mostly residential magnetic exposure at the root of the present health concern will be insignificant for this line, further limiting any health concerns. The potential for nuisance shocks will be minimized through grounding and other field-reducing measures to be implemented by the applicant in keeping with current PG&E practices which reflect compliance with GO-90 and Title 8, Section 2700 et seq. of the California Code of Regulations. Since the line will be located away from all area airports, any hazard to area aviation will be small. The use of low-corona conductors together with an appropriate line maintenance program will minimize the potential for interference with radio-frequency communication.

RECOMMENDATIONS

Since the proposed 230 kV transmission line will be designed according to the applicable safety and field-reducing guidelines, and routed over a relatively short distance to the existing power grid, staff recommends its approval for the route proposed. If such approval is granted, staff recommends that the Commission adopt the following conditions of certification to ensure implementation of the measures necessary to achieve the field levels assumed by the applicant for the line design.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the project-specific 1,300-foot connection to the proposed PG&E switchyard according to the requirements of CPUC's GO-95, GO-52, Title 8, Section 2700 et seq. of the California Code of Regulations and PG&E's EMF-reduction guidelines arising from CPUC Decision 93-11-013. The project owner shall ensure that the 2,600-foot interconnecting lines from the new PG&E Switchyard to the PG&E power grid are constructed according to the same requirements.

Verification: Thirty days before starting construction of the project-specific line to the PG&E switchyard, the project owner shall submit to the Commission's Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the line will be constructed according to the requirements GO-95, GO 52, Title 8, Section 2700 et seq. of the California Code of Regulations and PG&E's EMF-reduction guidelines arising from CPUC Decision 93-11-013. Thirty days before the starting construction of the interconnecting line from the PG&E switchyard to the PG&E power grid, the project owner shall provide verification of agreement with PG&E regarding PG&E's construction and operation of this line according to the same requirements.

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. In addition to any transmission repairs, the relevant corrective actions should include, but shall not be limited to, adjusting or

modifying receivers, repairing, replacing or adding antennas, signal amplifiers, filters, or lead-in cables.

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

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

TLSN-3 The project owner shall engage a qualified consultant to measure the strengths of the line electric and magnetic fields from the project-related lines before and after they are energized. Measurements should be made at the same points along the route for which field strength values were presented by the applicant..

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

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

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

TLSN-5 The project owner shall ensure that all permanent metallic objects within the right-of-way of the project-related lines are grounded regardless of ownership. Such objects shall include fences, gates, and other large objects. These objects shall be grounded according to procedures specified in the National Electrical Safety Code.

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

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

REFERENCES

Three Mountain Power Generating Project (TMPP) 1999a. Application for Certification, (99-AFC-2). Submitted to the California Energy Commission, March 3, 1999.

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

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HAZARDOUS MATERIALS MANAGEMENT

Testimony of Rick Tyler

INTRODUCTION

The purpose of this analysis is to determine if the proposed Three Mountain Power Project (TMPP) (TMP, 1999a) will result in the potential for a significant impact on the public as a result of the use, handling or storage of hazardous materials at the proposed facility. If significant adverse impacts on the public are identified, Energy Commission staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce impacts to the extent feasible.

This analysis does not address potential exposure of workers to hazardous materials used at the proposed facility. There are specific regulations applicable to protection of workers in general the standards for exposure and methods used to protect workers are very different than those applicable to the general public. Employers must inform employees of hazards associated with their work and workers accept a higher level of risk than the general public in exchange for compensation. Workers are thus not afforded the same level of protection normally provided to the public. Further, special protective equipment and training can be used to protect workers and reduce the potential for health impacts associated with the handling of hazardous materials (see staff's **Worker Safety and Fire Protection** analysis). Application of this type of mitigation would not be appropriate for the general public.

The only hazardous material proposed for use at the TMPP in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j), is aqueous ammonia. The use of aqueous ammonia significantly reduces the risk that would otherwise be associated with use of the more economical anhydrous form of ammonia. Use of the aqueous form eliminates the high internal energy associated with the more hazardous anhydrous form, which is stored as a liquefied gas at high pressure. The high pressure and resultant latent internal energy associated with the anhydrous form of ammonia can act as a driving force in the event of an accidental release. Loss of containment involving anhydrous ammonia typically results in violent release and can rapidly introduce large quantities of the material into the ambient air, where it can be transported by the atmosphere and result in high down-wind concentrations. Spills associated with the aqueous form are typically much less violent and easier to contain. In addition, the emission rate from a release of aqueous ammonia is limited by mass transfer from the free surface of the spilled material, thus reducing the rate of emission to the atmosphere.

Other hazardous materials stored in smaller quantities, such as mineral and lubricating oils, corrosion inhibitors, water conditioners and hydrogen will be present at the proposed facility. However, these materials pose no significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, and/or their environmental mobility. Although no natural gas is stored, the project will also involve the construction and operation of a natural gas pipeline and handling of

large amounts of natural gas. Natural gas poses some risk of both fire and explosion. Any issues regarding the natural gas pipeline are addressed in staff's **Facility Design** analysis.

The TMPP will also require the transportation of aqueous ammonia to the facility. Analysis of ammonia transportation is addressed in staff's **Traffic and Transportation** analysis.

LAWS, ORDINANCES, REGULATIONS, STANDARDS AND POLICIES

The following federal, state, and local laws and policies generally apply to the protection of public health and hazardous materials management. Staff's analysis examines the project's compliance with these requirements.

FEDERAL

The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III and Clean Air Act of 1990 established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The Act (codified in 40 C. F. R., § 68.110 et seq.) requires the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility.

STATE

The requirements of the federal acts described above are reflected in the California Health and Safety Code section 25531 et seq. The California Health and Safety Code section 25534 directs facility owners storing or handling acutely hazardous materials in reportable quantities, to develop a Risk Management Plan (RMP) and submit it to appropriate local authorities, the United States Environmental Protection Agency (EPA), and the designated local Administering Agency for review and approval. The plan must include an evaluation of the potential impacts associated with an accidental release, the likelihood of an accidental release occurring, the magnitude of potential human exposure, any preexisting evaluations or studies of the material, the likelihood of the substance being handled in the manner indicated, and the accident history of the material. This new, recently developed program supersedes the California Risk Management and Prevention Plan (RMPP). This requirement is not applicable to the proposed TMPP project as none of the materials proposed for use are listed as acutely hazardous. The aqueous ammonia proposed for use at the facility will be exempt because the ammonia concentration in solution is 19%.

Title 8, California Code of Regulations, section 5189, requires facility owners to develop and implement effective safety management plans to insure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.

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

LOCAL AND REGIONAL

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

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

SETTING

SITE AND VICINITY DESCRIPTION

Several factors associated with the area in which a project is to be located affect its potential to cause public health impacts from an accidental release of a hazardous material. These include:

- The local meteorology,
- Terrain characteristics, and
- The location of population centers and sensitive receptors relative to the project.

Staff considered these factors, as discussed below, in assessing the potential public health impacts of the project.

METEOROLOGICAL CONDITIONS

Meteorological conditions, including wind speed, wind direction and air temperature, affect the extent to which accidentally released hazardous materials would be dispersed into the air and the direction in which they would be transported. This affects the level of public exposure to such materials and the associated health risks. When wind speeds are low and stable, dispersion is severely reduced and can lead to increased localized public exposure.

Recorded wind speeds and ambient air temperatures are described in the **Air Quality** section of the AFC (TMP, 1999a, AFC Appendix E). This data indicates that wind speeds below one meter per second and temperatures exceeding 80°F can occur in the project area. Therefore, staff suggested that the applicant use F

stability (stagnated air, very little mixing), one meter per second wind speed and an ambient temperature of 100° F in its modeling analysis of an accidental release to reflect worst case atmospheric conditions. These conditions were reflected in the modeling used to estimate the potential worst case impacts associated with an accidental ammonia release.

TERRAIN CHARACTERISTICS

The location of elevated terrain (terrain above the power plant stack height) is often an important factor to be considered in assessing potential exposure. An emission plume resulting from an accidental release may impact high elevations before impacting lower elevations. The principal risk of accidental release at this facility is associated with aqueous ammonia. However, modeling of an accidental release of aqueous ammonia indicates that significant concentrations would be confined to the facility property. Thus, elevated terrain is not an important factor affecting the modeled results for the project.

LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses (Calabrese 1978). Also, the location of the population in the area surrounding a project site may have a large bearing on health risk. Figure 6.10-2 (TMP, 1999a) shows the locations of both populated areas and sensitive receptors in the project vicinity.

IMPACTS

Based on the hazard potential and quantities to be stored or handled, the Energy Commission staff has determined that aqueous ammonia, natural gas, and possibly hydrogen are the only hazardous materials that pose a risk of off-site impacts. The following is a project specific analysis of the potential impacts associated with the handling of each of these materials. Aqueous ammonia could be released from the storage tank directly or during delivery of ammonia from the delivery vehicle to the storage tank.

AQUEOUS AMMONIA

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

To assess the potential impacts associated with an accidental release of ammonia, staff typically evaluates where four “bench mark” exposure levels of ammonia gas occur off-site. These include: 1) the lowest concentration posing a risk of lethality, 2,000 ppm; 2) the Immediately Dangerous to Life and Health (IDLH) level of 300 ppm; 3) the Emergency Response Planning Guideline (ERPG) level 2 of 200 ppm, which is also the RMP level 1 criterion used by EPA and California; and 4) the level considered by the Energy Commission staff to be without serious adverse effects on

the public for a one-time exposure of 75 ppm. (A detailed discussion of the exposure criteria considered by staff and their applicability to different populations and exposure-specific conditions is provided in Appendix A of this analysis.) If the exposure associated with a potential release would exceed 75 ppm at any public receptor, staff will presume that the potential release poses a risk of significant impact. However, staff may also assess the probability of occurrence of the release and/or the nature of the potentially exposed population. Staff may, based on such analysis, determine that the likelihood and extent of potential exposure are not sufficient to support a finding of potentially significant impact.

The applicant provided the results of modeling for a worst case accidental release of aqueous ammonia (TMP, January 6, 2000, Revised Offsite Consequence analysis). The worst-case release scenario is associated with a postulated spontaneous catastrophic storage tank failure. In conducting this analysis, it was assumed that spilled material would be contained in the covered basin below the storage vessel and that winds of 1.0 meters per second and category F stability would exist at the time of the accidental release. This screening analysis was designed to predict the maximum possible impacts based on distance from the storage tank without regard to specific direction of transport. This analysis indicated that concentrations exceeding 75 PPM would be confined to the project site. Staff agrees with the modeling approach and estimates of downwind concentrations associated with the storage tank failure scenario. However, staff believes that a more plausible scenario would involve a release during transfer of ammonia from the delivery vehicle to the storage tank. Staff contends that provisions to catch a release between the delivery vehicle and the storage vessel are necessary to avoid such a release. Material spilled during delivery could result in a pool with significantly greater surface area than reflected in the applicant's modeling. In addition the facility will not be required to prepare a Process Safety Management Plan. However, such a plan addressing delivery of aqueous ammonia would significantly reduce the potential for human errors that could result in other types of unanticipated releases. Staff believes that the potential for an uncontained spill during delivery can be avoided by providing a catchment basin directing any spill that occurred during delivery to a covered basin. If these additional measures are employed they will reduce the potential of spills that are not reflected by the tank failure scenario.

NATURAL GAS AND HYDROGEN

Natural gas, which will be used as a fuel by the project, poses a fire and/or explosion risk as a result of its flammability. While natural gas will be used in significant quantities, it will not be stored on-site. The risk of a fire and/or explosion from natural gas can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. The National Fire Protection Association (NFPA) Code 85A requires: 1) the use of double block and bleed valves for gas shut-off; 2) automated combustion controls; and 3) burner management systems. These measures will significantly reduce the likelihood of an explosion in gas fired equipment. Additionally, start-up procedures will require air purging of the gas turbines prior to start-up, thus precluding the presence of an explosive mixture.

The facility will also require the installation of a short natural gas pipeline that could result in accidental release of natural gas. The design of the natural gas pipeline is governed by laws and regulations discussed in staff's **Facility Design** analysis. Staff believes that these measures are sufficient to reduce the risk of a natural gas release to insignificant levels.

Hydrogen will also be used by the project as a heat transfer fluid to cool the generators. The storage of hydrogen will be done in accordance with the requirements set forth in Title 8 of the California Code of Regulations. Hydrogen is both flammable and explosive. However it is unlikely that a fire or explosion involving this material would result in significant impacts on the public as a result of the amounts stored and the distance separating the storage facility and public receptors.

CUMULATIVE IMPACTS

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

FACILITY CLOSURE

The requirements for handling of hazardous materials remain in effect until such materials are removed from the site. Regardless of facility closure the facility owners are responsible for continuing to handle such materials in a safe manner, as required by applicable laws. In the event that the facility owner abandons the facility, in a manner which poses a risk to surrounding populations, staff will coordinate corrective action with the California Office of Emergency Services, Shasta County Environmental Health Department and the California Department of Toxic Substances Control (DTSC) to ensure that any unacceptable risk to the public is eliminated. Funding for such emergency action can be provided by federal, state or local agencies until the cost can be recovered from the responsible parties (O.E.S. 1990).

MITIGATION

The worst case accidental release scenario for ammonia evaluated by the applicant assumed that all accidental spills would occur from the storage vessel into the basin below the storage vessel. However, it is more likely that a spill would occur during delivery of ammonia. Such a spill could result in a large pool of aqueous ammonia and significantly higher down wind concentrations of ammonia. Thus, staff proposes a condition of certification requiring a catchment basin be provided between the delivery vehicle and the storage loading connection. This basin would passively drain into the basin below the storage tank or into a separate covered basin capable of containing the entire delivery vehicle's volume.

Staff also proposes a condition requiring development of a safety management plan for delivery of aqueous ammonia. The TMPP may not be required to develop and implement a Process Safety Plan pursuant to Title 8. The development of a Safety

Management Plan addressing delivery of ammonia would, however, further reduce the risk of any accidental release not addressed by the proposed spill prevention mitigation measures associated with the project and staff's proposed additional mitigation.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSION

Staff's evaluation of the proposed project (with staff's proposed mitigation measures) indicates that hazardous materials use will pose no potential for significant impacts on the public. With adoption of the proposed conditions of certification, the project will comply with all applicable laws, ordinances, regulations and standards (LORS). With adoption of staff's proposed conditions of certification, the project will also comply with Health and Safety Code, section 41700, and it will not pose any potential for significant impacts to the public from hazardous materials releases.

RECOMMENDATION

Staff recommends the Energy Commission impose the proposed conditions of certification, presented herein, to ensure that the project is designed, constructed and operated to comply with applicable LORS and to protect the public from significant risk of exposure to an accidental release of ammonia or any other hazardous materials.

PROPOSED CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous material in reportable quantities, as specified in Title 40, C. F.R. Part 355, Subpart J, section 355.50, not listed in Appendix B, below, or in greater quantities than those identified by chemical name in Appendix B, below, unless approved in advance by the CPM.

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

HAZ-2 The project owner shall develop and implement a safety management plan for delivery of ammonia. The plan shall include procedures, protective equipment requirements, training and a checklist.

Verification: At least 60 days prior to the delivery of aqueous ammonia to the facility, the project owner shall provide a safety management plan as described above to the CPM for review and approval.

HAZ-3 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 150% of the storage volume plus the volume associated with 24 hours of rain assuming a 25 year storm.

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

HAZ-4 The project owner shall provide a covered secondary containment basin to passively contain any spill during the delivery of aqueous ammonia to the storage facility.

Verification: At least 60 days prior to construction of the secondary containment basin described above, the project owner shall provide detailed design drawings and specifications for the secondary containment basin to the CPM for review and approval.

REFERENCES

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

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

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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.

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

Staff uses a criterion of 75 ppm to evaluate the significance of impacts associated with potential accidental releases of ammonia. While this criterion is not consistent with the 200 ppm criterion used by EPA and Cal EPA in evaluating such releases pursuant the Federal Risk Management Program and State Accidental Release Program, it is appropriate for use in staff's CEQA analysis. The Federal Risk Management Program and the State Accidental Release Program are administrative programs designed to address emergency planning and ensure that appropriate safety management practices are implemented and actions are taken in response to accidental releases. However, the regulations implementing these programs do not provide clear authority to require design changes or other major changes to a proposed facility. The preface to the Emergency Response Planning Guidelines (ERPGs) states that "these values have been derived as planning and emergency response guidelines, **not** exposure guidelines, they do not contain the safety factors normally incorporated into exposure guidelines. Instead they are estimates, by the committee, of the thresholds above which there would be an unacceptable likelihood of observing the defined effects." It is staff's contention that these values apply to healthy adult individuals and are levels that should not be used to evaluate the acceptability of avoidable exposures. While these guidelines are useful in decision making in the event that a release has already occurred (for example, prioritizing evacuations), they are not appropriate for and are not binding on discretionary decisions involving proposed facilities where many options for mitigation are feasible. CEQA requires permitting agencies making discretionary decisions to identify and mitigate potentially significant impacts through changes to the proposed project.

Staff has chosen to use the National Research Council's 30 minute Short Term Public Emergency Limits (STPELs) to determine the potential for significant impact. These limits are designed to apply to accidental unanticipated releases and subsequent public exposure. Exposure at these levels should not result in "serious sequelae" but would result in "strong odor, lacrimation, and irritation of the upper respiratory tract (nose and throat), but no incapacitation or prevention of self-rescue." It is staff's opinion that exposures of the general public to concentrations above these levels pose significant risk of adverse health impacts on sensitive members of the general public. It is also staff's position that these exposure limits are the best available criteria to use in gauging the significance of public exposures associated with potential accidental releases. It is, further, staff's opinion that these limits constitute an appropriate balance between public protection and mitigation of unlikely events, and are useful in focusing mitigation efforts on those release scenarios that pose real potential for serious impacts on the public. Table 1 provides a comparison of the intended use and limitations associated with each of the various criteria that staff considered in arriving at the decision to use the 75 ppm STPEL..

HAZARDOUS MATERIAL MANAGEMENT
APPENDIX A TABLE 1
Acute Ammonia Exposure Guidelines

Guideline	Responsible Authority	Applicable Exposed Group	Allowable Exposure Level	Allowable* Duration of Exposures	Potential Toxicity at Guideline Level/Intended Purpose of Guideline
IDLH[2]	NIOSH	Workplace standard used to identify appropriate respiratory protection.	300 ppm	30 min.	Exposure above this level requires the use of "highly reliable" respiratory protection and poses the risk of death, serious irreversible injury or impairment of the ability to escape.
IDLH/10[1]	EPA, NIOSH	Work place standard adjusted for general population factor of 10 for variation in sensitivity	30 ppm	30 min.	Protects nearly all segments of general population from irreversible effects
STEL[2]	NIOSH	Adult healthy male workers	35 ppm	15 min. 4 times per 8 hr day	No toxicity, including avoidance of irritation
EEGL[3]	NRC	Adult healthy workers, military personnel	100 ppm	Generally less than 60 min.	Significant irritation but no impact on personnel in performance of emergency work; no irreversible health effects in healthy adults. Emergency conditions one time exposure
STPEL[4]	NRC	Most members of general population	50 ppm 75 ppm 100 ppm	60 min. 30 min. 10 min.	Significant irritation but protect nearly all segments of general population from irreversible acute or late effects. One time accidental exposure
TWA[2]	NIOSH	Adult healthy male workers	25 ppm	8 hr.	No toxicity or irritation on continuous exposure for repeated 8 hr. work shifts
ERPG-2[5]	AIHA	Applicable only to emergency response planning for the general population (evacuation) (not intended as exposure criteria) (see preface attached)	200 ppm	60 min.	Exposures above this level entail** unacceptable risk of irreversible effects in healthy adult members of the general population (no safety margin)

1) (EPA 1987) 2) (NIOSH 1994) 3) (NRC 1985) 4) (NRC 1972) 5) (AIHA 1989)
* The (NRC 1979), (WHO 1986), and Haber's Law all suggest a direct relationship to increases in effect with both increased exposure and increased exposure duration of exposure for direct non-specific irritants such as ammonia .
** 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

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

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

ABBREVIATIONS

ACGIH, American Conference of Governmental and Industrial Hygienists
AIHA, American Industrial Hygienists Association
EEGL, Emergency Exposure Guidance Level
EPA, Environmental Protection Agency
ERPG, Emergency Response Planning Guidelines
IDLH, Immediately Dangerous to Life and Health Level
NIOSH, National Institute of Occupational Safety and Health
NRC, National Research Council
STEL, Short Term Exposure Limit
STPEL, Short Term Public Emergency Limit
TLV, Threshold Limit Value
WHO, World Health Organization

HAZARDOUS MATERIAL MANAGEMENT
Appendix B

[Insert here Table 6.10-1 from the AFC (TMP, 1999a)]

WASTE MANAGEMENT

Testimony of Michael Ringer

INTRODUCTION

This analysis presents an assessment of issues associated with managing wastes generated from constructing and operating the proposed Three Mountain Power Project (TMPP). It evaluates the proposed waste management plans and mitigation measures designed to reduce the risks and environmental impacts associated with handling, storing, and disposing of project-related hazardous and nonhazardous wastes. The technical scope of this analysis encompasses wastes generated during facility construction and operation, except wastewaters discharged to navigable waters. Such wastewaters are discussed in the **Soil and Water Resources** section of this document.

The objectives of staff's waste management analysis are to ensure that:

- The management of the wastes will be in compliance with all applicable laws, ordinances, regulations, and standards (LORS). Compliance with LORS ensures that wastes generated during constructing and operating the proposed project will be managed in an environmentally safe manner; and
- Disposal of project wastes will not result in significant adverse impacts to existing waste disposal facilities;

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

RESOURCE CONSERVATION AND RECOVERY ACT - RCRA (42 U.S.C. § 6922)

RCRA establishes requirements for the management of hazardous wastes from the time of generation to the point of ultimate treatment or disposal. Section 6922 requires generators of hazardous waste to comply with requirements regarding:

- Record keeping practices which identify quantities of hazardous wastes generated and their disposition,
- Labeling practices and use of appropriate containers,
- Use of a manifest system for transportation, and
- Submission of periodic reports to the U.S. Environmental Protection Agency or authorized state.

TITLE 40, CODE OF FEDERAL REGULATIONS, PART 260

These sections contain regulations promulgated by the EPA to implement the requirements of RCRA as described above. Characteristics of hazardous waste are described in terms of ignitability, corrosivity, reactivity, and toxicity, and specific types of wastes are listed.

STATE

CALIFORNIA HEALTH AND SAFETY CODE §25100 ET SEQ. (HAZARDOUS WASTE CONTROL ACT OF 1972, AS AMENDED)

This act creates the framework under which hazardous wastes must be managed in California. It mandates the State Department of Health Services (now the Department of Toxic Substances Control under the California Environmental Protection Agency, or Cal EPA) to develop and publish a list of hazardous and extremely hazardous wastes, and to develop and adopt criteria and guidelines for the identification of such wastes. It also requires hazardous waste generators to file notification statements with Cal EPA and creates a manifest system to be used when transporting such wastes.

TITLE 14, CALIFORNIA CODE OF REGULATIONS, §17200 ET SEQ. (MINIMUM STANDARDS FOR SOLID WASTE HANDLING AND DISPOSAL)

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

TITLE 22, CALIFORNIA CODE OF REGULATIONS, §66262.10 ET SEQ. (GENERATOR STANDARDS)

These sections establish requirements for generators of hazardous waste. Under these sections, waste generators must determine if their wastes are hazardous according to either specified characteristics or lists of wastes. As in the federal program, hazardous waste generators must obtain EPA identification numbers, prepare manifests before transporting the waste off-site, and use only permitted treatment, storage, and disposal facilities. Additionally, hazardous waste must only be handled by registered hazardous waste transporters. Generator requirements for record keeping, reporting, packaging, and labeling are also established.

LOCAL

There are no additional local LORS to be considered.

SETTING

PROJECT AND SITE DESCRIPTION

TMPP consists of a 500 megawatt natural gas-fired combined cycle power plant and associated transmission lines, natural gas pipeline, and water pipelines.

The proposed site is located about one mile east of the town of Burney, on a 40 acre site that is zoned for industrial use. About one-third of the site is currently used by Burney Mountain Power, which is a ten megawatt biomass-fired facility. The portion of the site for the proposed facility is undeveloped except for light poles and underground water lines associated with the adjacent Burney Mountain Power facility.

Ogden Environmental and Energy Services Co., Inc. conducted a Phase I Environmental Site Assessment (ESA) of the proposed site for the applicant, including the alternative natural gas tie-in line routes, electrical transmission tie-in line route, and water pipeline route (TMPP 1999a, AFC Appendix H). The purpose of an ESA is to determine the potential for the presence or likely presence of any hazardous substances or petroleum products under conditions that may indicate a release or threat of a release from present or past activities.

The ESA reported that no evidence of the use, storage, or disposal of hazardous substances or petroleum hydrocarbons was observed on either the subject plant site or the electrical transmission tie-in route or any of the pipeline alternative alignments. Limited surface soil staining was observed in the west-central portion of the site, and is believed to be associated with spontaneous combustion of a pile of wood chips. Ogden recommended that limited surface soil sampling be conducted in areas of visible staining for polynuclear aromatic hydrocarbons, dioxins, and furans, which are commonly associated with combustion by-products.

Ogden also reviewed federal, state, and regional database lists of reported hazardous waste and substance sites, and determined that there are no nearby properties that have the potential to affect the proposed plant site.

IMPACTS

PROJECT SPECIFIC IMPACTS

CONSTRUCTION

Project site preparation and construction of the generating plant and associated facilities will generate both nonhazardous and hazardous wastes.

Site preparation is likely to generate only minimal amounts of waste since the site is already cleared and there is little debris requiring disposal. However, any contaminated soils encountered in the area of the burned wood chips could require transportation offsite to a Class I (hazardous) disposal facility. If contaminated soils are encountered during site preparation or linear facility construction, the soil will be segregated, sampled, and tested to determine the extent of contamination. If the soil is classified as hazardous, the Shasta County environmental Health Department will be notified and the soil taken to an appropriate landfill, treatment, or recycling facility (TMPP 1999a, AFC p. 6.12-8).

Nonhazardous waste streams from construction include paper, wood, glass, scrap metal, and plastics, from packing materials, waste lumber, insulation, and empty chemical containers. The applicant estimates that about 50 cubic yards of these wastes will be generated on a weekly basis (TMPP 1999b, p. 60). Wastes which cannot be recycled will be collected in a covered dumpster maintained on site and disposed of in a Class III (nonhazardous) landfill (TMPP 1999a, AFC p. 6.12-4).

Hazardous wastes that may be generated during construction include waste oil and grease, paint, used batteries, spent solvent, welding materials, and cleanup materials from spills of hazardous substances. The construction contractor is considered the actual waste generator and will be responsible for proper hazardous waste handling. Hazardous wastes will be either recycled or disposed of in a licensed Class I hazardous waste landfill or treatment facility (TMPP 1999a, AFC p. 6.12-8). The types and amounts of hazardous wastes expected during facility construction are listed in the project applicant's response to staff data request 40 (TMPP 1999b, p. 60).

Initial pre-operational cleaning of internal surfaces of the heat recovery steam generators and turbines will also generate chemical waste cleaning solutions and filters. The cleaning will be conducted by a licensed contractor who will transport the waste offsite for proper treatment and disposal in accordance with applicable regulatory requirements (TMPP 1999a, AFC p. 6.12-9).

OPERATION

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

Nonhazardous wastes generated during plant operation include trash, office wastes, empty containers, broken or used parts, used packing material, and used filters. The quantities of nonhazardous wastes generated from gas-fired facilities such as the Three Mountain project are typically minor. Ogden estimates that about five cubic yards monthly of such wastes will be generated (TMPP 1999b, p. 60).

During routine project operation, hazardous wastes likely to be generated include cleaning solutions, spent air pollution control catalysts, used oil and filters, used cleaning solvents, used batteries, and spent water treatment resins. The types and amounts of hazardous wastes expected during facility operation are listed in the project applicant's response to staff data request 40 (TMPP 1999b, p. 61). As AFC Table 6.12-1 and response to staff data request 40 show, much of the hazardous wastes generated will be recycled.

IMPACT ON EXISTING WASTE DISPOSAL FACILITIES

Nonhazardous waste which is not recycled will be disposed of at one of the regional Class III landfills in the area. AFC Table 6.12-2 lists Shasta County landfills which accept nonhazardous wastes. Project nonhazardous wastes are a small fraction (less than one tenth of one percent) of the daily permitted capacity of either landfill. Although the Anderson landfill has only about five years of remaining capacity, the West Central landfill has a permitted and approved addition which will extend its capacity for up to 25 years, and additional planned and approved phases which would allow up to 100 years of operation. Even when discounting the effects of recycling on the total amount of non-hazardous wastes destined for landfilling, the amount of waste generated during project construction and operation are insignificant relative to existing disposal capacity.

Three Class I landfills in California are permitted to accept hazardous waste: Chemical Waste Management's Kettleman Hills facility and Safety-Kleen Environmental Service's landfills in Buttonwillow in Kern County and Westmoreland in Imperial County. In total, there is in excess of twenty million cubic yards of remaining hazardous waste disposal capacity in California with remaining lifetimes as long as 90 years. The amount of hazardous waste being transported to these landfills has decreased in recent years due to source reduction efforts by generators, and the transport out of state of waste that is hazardous under California law, but not federal law.

Much of the hazardous waste generated during facility construction and operation will be recycled, such as used oil and spent catalysts. Even without recycling, the generation of hazardous waste from TMPP would be minor and not significantly impact the capacity of any of the state's Class I landfills.

CUMULATIVE IMPACTS

Staff is unaware of major projects in the area which could add significant amounts of wastes to the minor amounts of wastes generated during construction and operation of the Three Mountain Power Project. Therefore, cumulative impacts of wastes on the daily operation or remaining life of individual disposal facilities will be insignificant. The additional availability of regional landfills also ensures that cumulative impacts for both hazardous and nonhazardous wastes will not be significant.

FACILITY CLOSURE

During any type of facility closure (see staff's **General Conditions** section which discusses planned, unexpected temporary, and unexpected permanent closure), the primary waste management related concern is that project wastes not pose any potentially significant problem to the public, workers, or the environment. Staff believes that conditions of certification in the General Conditions section will adequately address waste management issues related to closure.

In the case of unexpected temporary closure, waste management practices normally required by LORS and already in-place (such as limiting hazardous waste accumulation time to 90 days and requiring proper containment) would likely be adequate to avoid significant problems. In addition, staff's General Conditions for Facility Closure require preparation of an on-site contingency plan which shall provide for removal of hazardous wastes and draining of all chemicals from storage tanks and other equipment for temporary closures exceeding 90 days.

An approved on-site contingency plan is also required to protect public health and safety in the case of unexpected permanent closure. As above, the plan must provide for the removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment.

For planned permanent closure, TMPP is required to develop a facility closure plan at least twelve months prior to commencement of closure and is committed to complying with LORS which are applicable at the time of closure (TMPP 1999a, AFC p. 4-2).

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

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

MITIGATION

The applicant intends to implement the following mitigation measures during construction and operation of the proposed project:

- Prior to facility startup, a waste management plan will be developed which will include details on the handling, packaging, labeling, storage, recordkeeping, treatment, and disposal of wastes. It will also include provisions for personnel training and emergency procedures (TMPP 1999a, AFC p. 6.12-12).
- A waste minimization program will be designed that includes procedures to reduce inventories of hazardous materials, thus avoiding the need to dispose of excess hazardous materials as wastes. Hazardous wastes will be recycled wherever possible, and nonhazardous and non-waste-generating materials will be used in place of hazardous materials (TMPP 1999a, AFC p. 6.12-13).

Energy Commission staff has examined the mitigation measures proposed by the applicant and concluded that the measures together with applicable LORS will adequately assure that no significant environmental impacts will result from the management and disposal of project-related waste.

CONCLUSIONS AND RECOMMENDATIONS

Management of the wastes generated during construction and operation of the Three Mountain Power project will not result in any significant adverse impacts if Ogden implements the mitigation measures proposed in the Application for

Certification (99-AFC-2), the additional measures proposed by staff below, and the proposed conditions of certification.

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

Staff also proposes a condition of certification that, in accordance with Ogden Environmental and Energy Services Company's Phase I ESA recommendation, requires limited surface soil sampling to be conducted, in areas of visible staining, for polynuclear aromatic hydrocarbons, dioxins, and furans, which are commonly associated with combustion by-products

CONDITIONS OF CERTIFICATION

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

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

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

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

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

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

requirements and sites, and recycling and waste minimization/reduction plans.

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

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

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

WASTE-5 In areas of visible soil staining resulting from wood chip storage pile fires, the project owner shall conduct representative surface soil sampling for polynuclear aromatic hydrocarbons (PAHs), dioxins, and furans. If, in the opinion of the environmental professional, significant remediation may be required, the project owner shall contact representatives of the Shasta County Environmental Health Department and the Sacramento Field Office of the California Department of Toxic Substances Control for guidance and possible oversight.

Verification: Thirty days prior to disturbing earth which may be contaminated with byproducts from wood chip combustion, the project owner shall submit to the CPM results from the soil sampling required in WASTE-5, the recommendation of the environmental professional regarding the need for remediation, and notification of any contact made with the Shasta County Environmental Health Department and the Sacramento Field Office of the California Department of Toxic Substances Control.

WASTE-6 Except for the routine collection and storage of wastes, the project owner shall not store or accumulate on site wrecked or dismantled vehicles or parts, discarded items, junk, or inoperable machinery.

Verification: The project owner shall certify in the annual compliance report that storage of prohibited materials has not occurred.

REFERENCES

TMPP (Ogden Three Mountain Power, LLC). 1999a. Application for Certification for Three Mountain Power Project, (99-AFC-2). Submitted to the California Energy Commission, March 3.

TMPP (Ogden Three Mountain Power, LLC). 1999b. Responses to CEC Staff Data Requests. September 1.

LAND USE

Testimony of Gary D. Walker

INTRODUCTION

The land use analysis of the Three Mountain Power Project (TMPP) focuses on two main issues: the project's consistency with applicable land use plans, ordinances and policies; and the project's compatibility with existing and planned land uses. In general, an electric generation project and its related facilities can be incompatible with existing and planned land uses when it restricts or precludes such uses.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The proposed project is located entirely in Shasta County, California.

SHASTA COUNTY

Staff reviewed the land use planning documents listed below for goals, policies and regulations relevant to the proposed project. A discussion of the project's conformity with applicable goals, policies, standards and regulations from each of these planning documents can be found in the **COMPLIANCE WITH LORS** section of this assessment.

GENERAL PLAN

The Shasta County General Plan, last updated in 1998, sets forth the general, long-range policies regarding how the county's future development should occur. The General Plan primarily addresses the use of the privately and publicly owned land resources located in the county. The General Plan is not a detailed, parcel-specific policy statement. Instead, it establishes a generalized pattern of future land use which provides the basis for more detailed plans. Its function is to provide a policy framework that must be reflected in the zoning ordinance, specific plans, and other development guidelines (Shasta County 1998, p.1.0.01).

Although there are no specific General Plan policies relating to development of power plants, there are many policies that set standards for industrial development. The General Plan contains mandatory and nonmandatory elements divided into three groups: Public Safety (Seismic and Geologic Hazards, Flood Protection, Dam Failure Inundation, Fire Safety, Noise, and Hazardous Materials); Resources (Agricultural Lands, Timberlands, Minerals, Energy, Air Quality, Water Resources and Water Quality, Fish and Wildlife Habitat, Scenic Highways, Open Space and Recreation, and Heritage Resources); and Community Development (Community Organization and Development, Economic Development, Housing Element, Circulation, Public Facilities, and Design Review). Many of these elements are discussed in the relevant sections of this assessment. Portions of the General Plan relevant to land use are addressed below.

One primary General Plan strategy that relates to the project is the approach to growth. The General Plan adopts a strategy of growth accommodation (Shasta

County 1998, p.3.0.02). The plan states that growth may be accommodated and the quality of life may preserved if County government, through the General Plan and its implementing regulations, directs growth to areas of the County where and when the land supply is available to accommodate growth. The General Plan (p.2.0.03) acknowledges that industrial and other growth has occurred in areas including Burney Valley where conditions have been conducive. The historic growth pattern has resulted in nearly 90% of the population of the County residing in 2 of the 10 planning areas (South Central Region – 84%; North East Shasta – 5.5%) based on 1990 Census data. The project is located in the North East Shasta Planning Area. The General Plan recognizes the primary role in accommodating new population growth will be assumed by the South Central Region and North East Shasta Planning Areas (Shasta County 1998, p.3.0.03).

Section 7.1 – Community Organization and Development Pattern

Policy Co-f: The General Plan shall contain residential, commercial, and industrial land use categories, each of which is described in the following tables and shall be implemented through more specific zone districts:

- CO-7 – Residential
- CO-8 – Commercial
- CO-9 – Industrial

Table CO-9 of the General Plan shows industrial land use categories and policies. In regard to locational requirements, it states that General Industrial uses should be located along a freeway, highway, or arterial. They are designated on the General Plan land use Map as Industrial (I).

ZONING ORDINANCE

Government Code Section 65860 requires that the County's zoning ordinance be consistent with its General Plan. The Shasta County Zoning Plan (Title 17 of the Shasta County Code) (Shasta County 1999a) was most recently amended on July 23, 1999. The purpose of the zoning ordinance is to promote and protect the public health, safety, peace, morals, comfort, convenience, and general welfare; to implement the county general plan; to facilitate and guide growth in accordance with the general plan; and to protect the social and economic stability of residential, commercial, industrial, resource production, and recreational activities within the county through the orderly, planned use of the land (Section 17.02.010).

The following sections of the Zoning Ordinance are applicable to the project.

Chapter 17.58 – General Industrial (M) District.
Subchapter 17.58.010 states that this district is consistent with the industrial (I) general plan land use designation.

Subchapter 17.58.030 (I) includes power generating plants as a use permitted in the M district if a use permit is issued.

Subchapter 17.58.050 specifies site development standards. One standard (D) is that maximum structural height is 45 feet.

Standard K requires an applicant for either a building permit or a use permit to submit a site plan which lists how the standards listed in the section will be met.

Chapter 17.78 – Design Review District

Subchapter 17.78.010 states that the design review (DR) district is intended to be combined with any principal district for one or more of the following purposes:

1. To protect areas having unique environmental, physical, historical or scenic features;
2. To promote development which features a variety of amenities and design features;
3. To encourage creative approaches to use of land and related physical environment;
4. To obtain advantages of coordinated, flexible, comprehensive, long-range planning;
5. To ensure compatibility with surrounding land uses;
6. To protect the public's health and safety.

The regulations of this district prevail over any conflicting regulation of any principal district with which this district is combined.

Subchapter 17.78.020 states that the uses permitted outright and those permitted with a zoning, administrative, or use permit in the principal district are permitted in the DR district if a use permit is issued [except for commercial use, which requires an administrative permit].

Subchapter 17.78.030 states that site development standards in the DR district shall, in the aggregate, meet or exceed the standards prescribed by the regulations for the principal district.

Each DR district shall be provided design review guidelines which direct the implementation of objectives for the district. In cases where there are no adopted countywide or community design guidelines for an area, the following general design review standards shall be met:

1. A design theme is prepared and established which takes into account the relationship of the project to the surrounding area, including, but not limited to, the proposed project's visual appeal and character, scale of development and sense of proportionality, building size and dimension, mix and pattern of color and architectural variation, lighting, signing and other physical relationships affecting appearance between various architectural styles found in and around the development.

2. Landscaping, consistent with the design theme, is provided which provides shading over 50 percent or more of parking and pedestrian areas within the project ten years after completion of the project.

Chapter 17.84 – General Development Standards

Subchapter 17.84.030 (B) addresses exceptions to height limitations, and includes the following elements relevant to the project.

1. Roof Structure: Smokestacks are exempted.
3. Transmission Lines: Electric transmission lines and towers are exempted.
4. Use Permit: Any `structure in any district may be erected to a greater height than the limit established for the district in which the structure is to be located, provided that a use permit is issued.

Chapter 17.86 – Off-Street Parking and Loading Regulations

This chapter includes a number of parking-related requirements, including the following items relevant to the project:

Subchapter 17.86.130 requires that a parking plan be submitted to and approved by the planning director prior to issuance of a building permit or use permit. This plan may be combined with a landscaping plan.

Subchapter 17.86.140 establishes parking standards, including for industry one parking space for each 1,000 square feet of manufacturing or warehousing area, or per employee, whichever is greater, plus one parking space for each 300 square feet of office area.

Chapter 17.88 - Special Uses

Subchapter 17.88.100 addresses public uses and public utilities, including transmission lines and towers. Item (A) specifies that public utility transmission lines and towers are permitted uses, regardless of height.

SETTING

POWER PLANT SITE AND VICINITY

The proposed power plant site is located in northeastern Shasta County, approximately 45 miles northeast of Redding. The site is situated approximately one mile northeast of the unincorporated town of Burney. The site is located along the west side of State Route 299, approximately one mile north of the intersection of State Route 299 and Black Ranch Road. Access to the site is from a paved private access road (Energy Drive). The facility would be developed on approximately 10.2 acres of an existing 40-acre site (Assessor's Parcel Number 030-390-36). The Fruit

Growers Supply Company owns the property. A 10 MW biomass-fired power plant operated by Burney Mountain Power is located on the northern portion of the 40-acre site. Burney Mountain Power has lease rights until the year 2032. A 100-foot railroad right-of-way crosses the property from north to south, with two-thirds of the property east of the right-of-way. This single-track railroad lies in the center of a 100-foot easement. The McCloud River Railway Company owns the railroad.

LAND USE Figure 1 shows existing land uses within one mile of the proposed power plant site and within 0.25 mile of the proposed linear facilities. Southwest of the site is the Burney Wastewater Treatment Plant, which is owned and operated by the Burney Water District. Linear transmission features within one mile of the proposed site include PG&E electrical transmission lines to the west and a PG&E natural gas transmission line to the east.

Sensitive land uses within one mile of the site are residences located in Johnson Park, the closest of which are approximately one-half mile away, and one single-family residence approximately 1,400 feet west of the site, on Black Ranch Road.

LAND USE Table 1 shows General Plan land use designations and zoning districts within the study area. **LAND USE Figure 2** shows the land use designations within a one-mile radius of the site and includes 0.25-mile distance from either side of the proposed linear (natural gas and electrical) transmission facilities. **LAND USE Figure 3** shows zoning districts for the same area.

According to the Shasta County General Plan, the site is designated for industrial use (map symbol "I") (see **LAND USE Table 1**). According to the Shasta County Zoning Map the site is zoned General Industrial (M) combined with a Design Review (DR) district.

NATURAL GAS SUPPLY ROUTE

The AFC proposed three natural gas tie-in line alternatives (Alternatives A, B, and C) (TMPP 1999a). Subsequently, the applicant selected Alternative A as the proposed route (White & Case/Cottle 1999a, Response to Data Request 16). The route would tie in to an existing PG&E pipeline. The PG&E pipeline extends in a southwest to northeast direction on the southeast side of State Route 299, with a paved maintenance road accessed from State Route 299 and an unpaved access road paralleling the existing pipeline route. Alternative A is proposed to extend 2,900 feet from the existing PG&E pipeline to the power plant site (see LAND USE Figure 4). This alternative would require a cleared area to allow maintenance and periodic inspection of the pipeline. The AFC (TMPP 1999a, p.6.3-12) stated that an estimated 1.3 acres of existing pine forest would be removed to the east and west of State Route 299. However, the applicant has subsequently stated that Burney Mountain Power Plant, located on the same parcel and adjacent to the proposed plant, will install a gas line in 1999 or early 2000 using the same Alternative A (White & Case/Cottle 1999a, Response to Data Request 16). Alternative A would require no timberland to be cleared because the timberland will already be removed

LAND USE Figure 1
Existing Land Uses within One Mile of the Proposed Power Plant Site and within 0.25 Mile of Proposed Linear Facilities

Source: TMPP 1999b, Figure 6.3-1

LAND USE Table 1

General Plan Designations and Zoning Districts within Project Study Area

LAND USE DESIGNATION	GENERAL PLAN MAP SYMBOL	ZONING MAP SYMBOL	DEFINITION
AGRICULTURAL AREAS			
Agricultural Croplands	AC	U	Unclassified
		EA-AP	Exclusive Agriculture/ Agricultural Preserve
Timberland	T	TP	Timber Production
		TL	Timberland
COMMERCIAL AREAS			
Commercial	C	C-2	Community Commercial
		C-M	Commercial Light Industrial
		C-M-DR	Commercial Light Industrial/ Design Review
RESIDENTIAL AREAS			
Rural Residential	RB	R-L	Limited Residential
Suburban Residential	SR	IR	Interim Rural Residential
		MHP	Mobile Home Park
Public Facilities	PF	PF	Public Facilities
INDUSTRIAL	I	M-DR	General Industrial/Design Review
		M-L-DR	Light Industrial/Design Review

Sources: Shasta County General Plan, October 1998; Shasta County Zoning Plan, August 1999.

LAND USE Figure 2
General Plan Land Use Designations
within One Mile of the Proposed Power Plant Site

Source: TMPP 1999a, Figure 6.3-2

LAND USE Figure 3
Zoning Districts within One Mile of the Proposed Power Plant Site and 0.25 Mile of Proposed Linear Facilities

Source: TMPP 1999a, Figure 6.3-3

for the Burney Mountain Power Plant gas line (White & Case/Cottle 1999a, Response to Data Request 21).

Potentially sensitive land uses within the 0.5 mile corridor of the Alternative A route include a residence approximately 1,800 feet from the line on Black Ranch Road and residences approximately 1,800 feet from the line in Johnson Park (see **LAND USE Figure 4**). The closest urban development in Burney is approximately one mile southwest of the Alternative A route.

There are no proposed residential developments in the 0.5 mile corridor along the proposed natural gas supply line route (TMPP 1999c, Response to Data Request 15).

LAND USE Table 2 shows land use designations and zoning districts crossed by the proposed Alternative A natural gas tie-in pipeline route.

LAND USE Table 2
General Plan Designations and Zoning Districts
Proposed Alternative A Natural Gas Tie-in Pipeline Route

GENERAL PLAN	ZONING
I: Industrial	M-DR: General Industrial/Design Review
I: Industrial	M-L-DR: Light Industrial/Design Review
SR: Suburban Residential	TL: Timberland
T: Timberland	TP: Timber Production

Sources: Shasta County General Plan, October 1998; Shasta County Zoning Plan, August 1999.

LAND USE Figure 5 shows General Plan land use designations in the area surrounding the Alternative A natural gas tie-in pipeline route.

LAND USE Figure 6 shows zoning districts in the area surrounding the Alternative A natural gas tie-in pipeline route.

WATER SUPPLY ROUTE

A 4,700 foot 24-inch water supply pipeline would be constructed from new water wells to the power plant. If the Burney Water District supplies the water, the District would also construct a 14-inch line for approximately 3,000 feet from the new wells to its proposed storage tank near Mountain View Road (see **LAND USE Figure 7**). The pipeline(s) would follow existing roadways and new rights-of-way (TMPP 2000, p.12).

The proposed water supply pipeline would pass within 3,600 feet of urban development in Burney, within 1,800 feet of a residence on Black Ranch Road, and within 3,300 feet of residences in Johnson Park (see **LAND USE Figure 1**).

LAND USE Figure 4
Existing Land Uses Near the Proposed Alternative A Natural Gas Supply Line

Source: White & Case/Cottle 1999a , Figure 17-1a

LAND USE Figure 5
General Plan Land Use Designations
Near the Proposed Alternative A Natural Gas Supply Line Route

Source: White & Case/Cottle 1999a , Figure 17-2a

LAND USE Figure 6
Zoning Districts
Near the Proposed Alternative A Natural Gas Supply Line Route

Source: White & Case/Cottle 1999a , Figure 2.2-10

LAND USE Figure 7
Proposed Water Supply Line Route

Source: White & Case/Cottle 1999a , Figure 2.1-10

LAND USE Table 3 shows General Plan land use designations and their corresponding zoning districts for the water supply pipeline.

LAND USE Table 3
General Plan Designations and Zoning Districts
Water Supply Pipeline

GENERAL PLAN	ZONING
I: Industrial	M-DR: General Industrial/Design Review
I: Industrial	M-L-DR: Light Industrial/Design Review
SR: Suburban Residential	TL: Timberland
T: Timberland	TP: Timber Production

Sources: Shasta County General Plan, October 1998; Shasta County Zoning Plan, August 1999.

ELECTRIC TRANSMISSION TIE-IN ROUTE

A 2,600 foot electrical transmission tie-in line would be constructed for the proposed project and would follow the railroad on the west side to the existing PG&E 230 kV transmission lines (TMPP 2000, p.12). The proposed electrical transmission tie-in route passes within approximately 1,800 feet of a residence on Black Ranch Road and within approximately 1,800 feet of residences in Johnson Park (see **LAND USE Figure 1**).

LAND USE Figure 2 shows General Plan designations for the electrical transmission tie-in line. **LAND USE Figure 3** shows zoning districts for the electrical transmission tie-in line.

LAND USE Table 4 shows General Plan land use designations and their corresponding zoning districts crossed by the electrical transmission tie-in line route. Land designated Rural Residential B (RB) and zoned Limited Residential (R-L) lies within 0.1mile west of the route.

LAND USE Table 4

General Plan Designations and Zoning Districts
Elelctrical Transmission Tie-in Lines

GENERAL PLAN	ZONING
I: Industrial	M-DR: General Industrial/Design Review
T: Timberland	TP: Timber Production

Sources: Shasta County General Plan, October 1998; Shasta County Zoning Plan, August 1999.

NEW PG&E SWITCHYARD

The project would require a new PG&E switchyard. The proposed location for the switchyard is on the existing 40-acre industrial parcel, adjacent to the existing Burney Mountain Power Plant (see PROJECT DESCRIPTION Figure 3).

ELECTRIC TRANSMISSION RECONDUCTORING ROUTE

The project will require reconductoring of two existing 230 kV transmission lines for a distance of about 60 linear miles: 19 miles from the new transmission line tie-in to the Round Mountain Substation; 9 miles to the Pit 3 Substation; and, 32 miles from the Round Mountain Substation to the Cottonwood Substation, located south of the city of Anderson. The project description in the AFC (TMPP 1999a, p.1-5) states that 88 miles of transmission line will be reconductored; however, that consists of 28 miles of a double circuit line (counted as 56 miles) and 32 miles of a single circuit for a total linear distance of 60 miles.

IMPACTS

According to Appendix G of the Guidelines to the California Environmental Quality Act (CEQA), a project may have a significant effect on land use if the project will:

- Physically divide an established community.
- 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.

A project may also have a significant impact on land use if it precludes or restricts existing or planned future uses.

COMPLIANCE WITH LORS

Public Resources Code section 25525 states that the Energy Commission shall not certify any facility when it finds "that the facility does not conform with any applicable state, local, or regional standards, ordinances, or laws, unless the commission determines that such facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving such public convenience and necessity." When determining if a project is in conformance with state, local or regional ordinances or regulations, the Energy Commission typically meets and consults with the applicable agencies to determine conformity and, when necessary, "to attempt to correct or eliminate any noncompliance" (Pub. Resources Code, § 25523(d)(1)). The laws, ordinances, regulations, standards (LORS) and policies applicable to the project have been analyzed below to determine the extent to which the project is consistent or at variance with each requirement or standard.

SHASTA COUNTY GENERAL PLAN

POWER PLANT SITE

As previously discussed, Shasta County has designated land in the Northeast Shasta Planning Area, including the proposed power plant site, for industrial use. The proposed site is designated I Industrial, and is zoned General Industrial.

The proposed site, located just off State Route 299, satisfies the requirement in Table CO-9 of the General Plan to locate General Industrial uses along a freeway, highway, or arterial.

In summary, the proposed power plant would comply with the Shasta County General Plan in regard to land use.

LINEAR FACILITIES

The Shasta County General Plan does not specifically address natural gas lines, water supply lines, or electric transmission lines. However, they are addressed in the Zoning Plan (see below).

SHASTA COUNTY ZONING PLAN

POWER PLANT

Industrial (M) District. Subchapter 17.58.030 (I) of the Zoning Plan includes power generating plants as a use permitted in the M district if a use permit is issued. In addition, private energy production is considered a public utility in the Shasta County Zoning Plan (Section 17.02.430). Public utilities are permitted if a use permit is issued, provided the use is found to be compatible with, and will not adversely impact, surrounding land uses (Section 17.88.100 A). As discussed below, staff has found that the project, with staff's proposed mitigation measures, would be compatible with, and would not adversely impact, surrounding land uses. Therefore, the project would meet the requirements for a use permit.

Subchapter 17.58.050 specifies site development standards for the general industrial (M) district. One standard (D) is that maximum structural height is 45 feet. Five project components (TMPP 1999a, p.6.6-40) would exceed this limit:

1. The two 140-foot tall Heat Recovery Steam Generator (HRSG) stacks,
2. The 118-foot tall electric transmission towers,
3. The 47-foot tall office/control building,
4. The 57-foot tall cooling tower, and
5. The 104-foot tall turbine building.

Subchapter 17.88.100 (A) specifies that public utility transmission lines and towers are permitted uses, regardless of height. Subchapter 17.84.030 (B) of the General Development Standards specifically allows roof-mounted structures, such as a chimney or television antenna, to exceed the maximum structural height limits. However, the Zoning Plan requires approval of a use permit to allow an industrial smokestack to exceed the maximum structural height limit allowed by the zoning district (Kaminski 2000).

Subchapter 17.84.030 (B) allows any structure in any district to be erected to a greater height than the limit provided that a use permit is issued. The applicant has

discussed the exemption to the height restriction in the zoning ordinance with the Shasta County Department of Resource Management, Planning Division. The Planning Division has indicated that their procedure would normally be to issue an exemption for the height limitation as part of the use permit process for the site. They have done this for other projects including the existing Burney Mountain Power plant located on the same parcel of land. The process involves conducting an environmental review under the California Environmental Quality Act. Because the Energy Commission's certification procedure is an equivalent process, the Planning Division has indicated that they will agree to an exemption from the zoning code, with appropriate conditions for visual mitigation, to be included in the Energy Commission's final approval of the project (White & Case/Cottle 1999a, Response to Data Request 26).). Shasta County's recommended conditions 9 and 10 are the conditions that the County would have required to mitigate the impacts of the tall power plant structures if a use permit had been issued (Kaminsky 2000). Energy Commission staff has incorporated these requirements in its proposed Visual Resources conditions of certification (see **VISUAL RESOURCES**).

Section 17.58.050 of the site development standards for general industrial (M) districts requires that an applicant for either a building permit or use permit shall submit a site plan which indicates how the standards listed in the section will be met. Staff's proposed Condition of Certification LAND-1 ensures that the project would comply with the applicable site development standards for the general industrial (M) district and includes review by Shasta County.

Chapter 17.84 of the Zoning Plan specifies general development standards. The applicable requirements, in the subchapters regarding landscaping, lighting, and signs, are addressed in the VISUAL RESOURCES section of this report.

As was stated previously, Subchapter 17.78.020 regarding the Design Review (DR) District states that the uses permitted outright and those permitted with a zoning, administrative, or use permit in the principal district are permitted in the DR district if a use permit is issued [except for commercial use, which requires an administrative permit]. Because the Energy Commission's Decision will fulfill the role of the use permit, the project would be permitted in the Design Review District, subject to the requirements of the District.

Subchapter 17.78.010 regarding the DR District states that the District is intended to be combined with any principal district for one or more of the following purposes:

1. To protect areas having unique environmental, physical, historical or scenic features;
2. To promote development which features a variety of amenities and design features;
3. To encourage creative approaches to use of land and related physical environment;
4. To obtain advantages of coordinated, flexible, comprehensive, long-range planning;

5. To ensure compatibility with surrounding land uses;
6. To protect the public's health and safety.

Although several of these purposes concern land use, all of the site development standards (Section 17.78.030) for a DR District address visual concerns. Therefore, the VISUAL RESOURCES section of this report addresses the topic of compliance with these standards.

Because of the Energy Commission's jurisdiction over thermal power plants 50 megawatts or larger, a use permit from the County is not required. Staff has proposed conditions of certification that contain the requirements that Shasta County recommends be placed on the approval of the project (Shasta Co/Kaminski 1999a), which would have presumably been placed on a use permit. Energy Commission adoption of these conditions in the Decision would achieve compliance with the use permit requirements of the Zoning Plan.

The County letter lists a number of conditions that it recommends be placed on approval of the project. Most of the County's recommended conditions concern and are addressed in other sections of this report. However, the following conditions are most appropriately addressed in regard to land use. (The numbers of the conditions are in the original.)

7. Prior to final approval of any proposed land division to create a separate parcel for the Burney Mountain Power Plant allowed by Use Permit Number 3-83, the plot plan and conditions of UP 3-83 shall be changed as appropriate to reflect the proposed plant and/or property segregation.
14. A screened cyclone fence with a six foot minimum height shall be placed along the northern property line adjacent to the property within the Timber Production (TP) district in accordance with the rural zone wall requirement (Zoning Plan Section 17.84.070). The fence shall be completed prior to final building permit inspection.
15. The property is located in an agricultural/timber use area and may be subject to impacts from the conduct of existing and future agricultural/timber related activities which may be considered objectionable. The project proponent shall acquire and provide all future property purchasers with a copy of Shasta County Ordinance No.94-2 and shall comply with the disclosure provisions of that ordinance.
16. An improved parking area shall be provided in accordance with Shasta County Ordinance Code Section 17.86. Improvements shall be completed prior to final building inspection.
17. A parking plan showing space location, dimensions and total number of spaces shall be provided prior to issuance of a building permit. A minimum of 25 spaces shall be provided based on 1 space per employee and a maximum of 25 employees proposed.
18. The parking area and access shall be improved to the following standard:

a. Surfaced with asphalt concrete paving. Asphalt concrete paving shall be type "B: with a minimum thickness of 0.14 feet placed over at least six (6) inches of compacted class 3 aggregate base or cinders.

b. Parking areas shall be striped.

19. All other internal access roads and driveways shall be surfaced with a minimum of four (4) inches of compacted "Class 3" aggregate base or cinders and maintained in a dust free condition.

Energy Commission staff has conferred with Shasta County staff regarding the County's recommended conditions numbers 2 (Kaminski 1999b, Kaminski 2000b). Energy Commission staff and Shasta County staff initially agreed that condition number 2 is not required because the County regulates transfer of property ownership, and the applicant had not indicated that any transfer of ownership was contemplated. However, subsequently the applicant informed County staff that an application to divide the land to create a separate parcel for the proposed project would be filed. Therefore, Energy Commission staff has included the County's recommended condition number 2 in its proposed conditions of certification (see below).

In regard to recommended condition number 17, Shasta County staff stated that 25 spaces is sufficient for the project, rather than providing one space for each employee and one space for each 300 square feet of office space, as the zoning plan specifies. This is because given the nature of the project most employees would occupy office space most of the time and because not all employees would work the same shift. Energy Commission staff has developed language in the proposed conditions of certification to reflect the County staff's recommendation.

Staff has incorporated the County's recommended conditions 2 and 14 through 19 in staff's proposed Conditions of Certification **LAND-2, LAND-3, Land-4, and LAND-5**.

Natural Gas Supply Line

The proposed natural gas supply line meets the definition of a public utility in the Shasta County Zoning Plan (Section 17.02.430). Public utility gas pipelines are permitted uses in Shasta County, according to Section 17.88.100 A of the Zoning Plan (Shasta County 1998).

Water Supply Line

The proposed water supply line meets the definition of a public utility in the Shasta County Zoning Plan (Section 17.02.430). Public utilities are permitted if a use permit is issued, provided the use is found to be compatible with, and will not adversely impact, surrounding land uses (Section 17.88.100). Water lines are not a specified permitted use. However, according to County planning staff, use permits are not required for connector lines for private users (Kaminski 1999a).

ELECTRIC TRANSMISSION TIE-IN LINE

The proposed electric tie-in line meets the definition of a public utility in the Shasta County Zoning Plan (Section 17.02.430). Public utility transmission lines and towers are permitted uses in Shasta County, according to Section 17.88.100 A of the Zoning Plan (Shasta County 1998).

NEW PG&E SWITCHYARD

The new PG&E switchyard required for the project meets the definition of a public utility in the Shasta County Zoning Plan (Section 17.02.430). Public utilities are permitted if a use permit is issued, provided the use is found to be compatible with, and will not adversely impact, surrounding land uses (Section 17.88.100 A). Switchyards are not among the list of uses excepted from the requirement for a use permit. As is discussed below, staff has found that the project is compatible with, and will not adversely impact, surrounding land uses. Therefore, the project would meet the requirements for a use permit.

RECONDUCTORING OF PG&E TRANSMISSION LINE

Potential land use impacts to nearby land uses due to reconductoring would occur only during construction and would therefore be temporary. Reconductoring would not cause a change in existing land use or cause any significant impacts to nearby land uses (see the **AIR QUALITY, NOISE, VISUAL RESOURCES, AND TRAFFIC AND TRANSPORTATION** sections of this document).

Transmission lines are allowed in any zoning district in Shasta County without a use permit, according to Section 17.88.100 A of the Zoning Plan (Shasta County 1998).

COMPATIBILITY WITH EXISTING AND PLANNED LAND USES

POWER PLANT

The proposed power plant would be located on a site that contains an existing electrical power plant. The proposed power plant represents further development of a site committed to energy-related uses, rather than the introduction of industry in a non-industrial area. The site is designated Industry (I) on the Shasta County General Plan Land Use Map. A power plant is consistent with this land use designation and would not constitute a change in the current development pattern of the area as established by the General Plan. No residences adjoin the power plant site. The site is buffered from the nearest residences by distance (approximately 1,400 feet) and trees. Staff has found that the project would not cause significant adverse effects on land uses in the vicinity (see the **AIR QUALITY, PUBLIC HEALTH, NOISE, VISUAL RESOURCES, and TRAFFIC AND TRANSPORTATION** sections of this document.

Burney Resource Group has raised a concern regarding impacts to prime agricultural land use within ½ mile of the proposed plant site due to increased salt levels that the project would cause (Burney Resource Group 2000). The California Regional Water Quality Control Board, Central Valley Region, has stated that it is likely to take a conservative approach in assessing any arguments for waiving of the

Board's anti-degradation provisions (California Regional Water Quality Control Board 2000). Energy Commission staff considers it very likely that the project will be required to prevent degradation of water quality. Therefore, the project would not cause adverse impacts to prime agricultural land use due to degraded water.

Burney Resource Group also commented that the change of land use designation would be required for a permit to allow a variance for two power plants on the same property. However, as discussed above, Shasta County has stated that the applicant intends to submit an application to divide the land to create a separate parcel for the proposed power plant.

At a recent status conference and hearing on motions, David A. Nelson of the California Department of Parks and Recreation expressed his concern regarding the power plant's potential to degrade Burney Falls (Nelson 1999). Mr. Nelson stated that the amount of water that the applicant estimated would be reduced at the falls due to the power plant would be significant. Burney Falls is the primary attraction in McArthur-Burney Falls Memorial State Park. Degradation of the falls could adversely affect the recreational land use of the park. Staff will investigate this issue and present its evaluation in amended testimony.

Two residential developments have been proposed for the vicinity of the proposed power plant site (see LAND USE Figure 8). The closest proposed residential development is across State Route 299, approximately 1,000 feet south of the proposed power plant site. The other proposed residential development is approximately 2,000 feet northwest of the proposed power plant site. Both of these developments are currently on hold. No action has been taken on either plan within the past two years and the owners of the developments have informed the applicant that no action in the near future will be taken to proceed with the developments (White & Case/Cottle 1999a, Response to Data Request 15). Even if these developments were to be completed, distance and existing trees would buffer them from the power plant site.

In summary, the proposed power plant would be compatible with existing and planned land uses in the vicinity.

NATURAL GAS PIPELINE

As discussed previously, Burney Mountain Power Plant will install a gas line in 1999 or early 2000 using the same route as Alternative A (White & Case/Cottle 1999a, Response to Data Request 16). Because Alternative A would therefore use a right of way that will already exist, it would not conflict with any existing use. Existing timberland in the right of way will be cleared for the Burney Mountain Power Plant gas line (White & Case/Cottle 1999a, Response to Data Request 21), so the proposed Alternative A line would have no effect on that resource. The route for Alternative A is not near any residences or other sensitive receptors (TMPP 1999a, pp.6.3-27 through 6.3-28), so construction of the pipeline would not have any adverse effects on such uses.

WATER SUPPLY PIPELINE

The proposed water pipeline will be buried. Underground pipelines generally require clearing, grading, and trenching during construction. Temporary disturbances related to air quality, traffic, noise, and visual resources could cause impacts to adjacent land uses during construction. The construction period would last 3 to 4 months (TMPP 1999a, p.6.3-30). However, construction in any particular location would be for a much shorter time.

Construction activities would occur along previously disturbed areas, such as maintenance roads or along public road rights-of-way in relatively undeveloped areas. Therefore, construction interference with existing land uses would be minimal.

The applicant estimates that two material and equipment staging areas would be required during the construction period, one at each end of the line (TMPP 1999a, pp.6.3-30 and 6.3-31). The staging areas would be located on previously disturbed sites. Because the use of the staging areas would be temporary and it would not displace any existing use, the impact would not be significant.

Construction of the water supply line and maintenance of the right-of-way would result in the permanent removal of 2.7 acres of Ponderosa Pine forest from timber production (TMPP 2000, p.12). This amount of land is not a substantial portion of the large area of timberland in the County.

ELECTRIC TRANSMISSION TIE-IN LINE

The proposed electrical transmission tie-in line would be adjacent to the McCloud River Railway easement (TMPP 2000a, p.12). Construction of the transmission line would require removal of 11.9 acres of Ponderosa Pine (see **BIOLOGICAL RESOURCES Table 3** in this document). The need to maintain a cleared right of way means that this land would be permanently removed from timber production. However, this amount of land is not a substantial portion of the large area of timberland in the County.

Operational impacts would consist of the total area permanently affected by the towers. The amount of land preempted from any other use would be approximately 100 square feet per tower structure (TMPP 1999a, p.6.3-29). Given the short length of the line (2,600 feet), the number of towers would be few and the amount of land preempted would be negligible.

Staff does not expect that the transmission line will cause a significant, permanent impact to existing land use. The proposed route will not disrupt or divide the physical arrangement of an established community.

NEW PG&E SWITCHYARD

Because the new PG&E switchyard required for the project would be on the existing site in an area that is not currently used, it would not displace any existing use. As

with the proposed power plant distance and existing trees would buffer residences from the switchyard.

RECONDUCTORING OF PG&E TRANSMISSION LINE

Reconductoring would not cause a change in existing land use. Potential land use impacts to nearby land uses due to reconductoring would occur only during construction and would therefore be temporary. Such impacts would not be significant (see the **AIR QUALITY, NOISE, VISUAL RESOURCES, AND TRAFFIC AND TRANSPORTATION** sections of this assessment).

THE PROPOSED PROJECT AS A WHOLE

The project would preclude an existing land use because the project elements would cause a combined loss of 19.6 acres of timberland (TMPP 2000, p.12). However, this would not constitute a substantial reduction in the amount of timberland in the County, so it would not be a significant land use impact. None of the project elements would preclude or restrict any planned land uses or physically divide an established community. In summary, the project would not cause any significant land use impacts.

CUMULATIVE IMPACTS

Three other substantial development projects have been proposed in the Burney area. Two are residential developments. One is for approximately 300 acres approximately 2,000 feet northwest of the proposed power plant site, along Black Ranch Road (see **LAND USE Figure 8**). The other is for a slightly larger acreage approximately 1,000 feet south of the project site, across State Route 299 (see **LAND USE Figure 8**). However, both of these developments are currently on hold. No action has been taken on either plan within the past two years and the owners of the developments have informed Three Mountain Power that no action in the near future will be taken to proceed with the developments (White & Case/Cottle) 1999a, Response to Data Request 15). A proposed 40-acre commercial project located on the southeast corner of State Route 299 and State Route 89 is approximately 2.5 miles north of the proposed power plant site. This development was approved in August 1997, but the developer has not been able to construct the project due to financial reasons. According to the Shasta County Planning Division, the project applicant is currently searching for financial investors to be able to develop the site and there is no proposed date for construction (Ogden Three Mountain Power/McFadden 1999b).

Short-term impacts to nearby land uses during construction such as from increased noise, dust, and traffic would be mitigated by project-specific mitigation measures (see the **NOISE, AIR QUALITY, AND TRAFFIC AND TRANSPORTATION** sections of this document). They therefore should not contribute substantially to cumulative impacts.

The proposed project would contribute to the gradual intensification of land use in the area. This trend is anticipated in the Shasta County General Plan, which has designated land for such development (Shasta County 1999a).

The proposed project would contribute to the cumulative loss of timberland in the County. The project would permanent remove 19.6 acres of Ponderosa Pine (TMPP 2000, p.12). Considering the large amount of timberland in the County, this reduction would not contribute substantially to the cumulative loss of timberland.

LAND USE Figure 8
Location of Proposed Residential Developments

Source: White & Case/Cottle 1999a , Figure 15-1

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 closure occurs in such a way that public health and safety and the environment are protected from adverse impacts.

The information provided in the AFC did not specifically address the effects of project closure on land use issues and concerns. The planned lifetime of the proposed project is 35 years (TMPP 1999a, p.4-1). The applicant will prepare a Facility Closure Plan for submittal to the Energy Commission for review and approval, at least twelve months prior to the proposed closure. At the time of closure, all then-applicable LORS will be identified and the closure plan will address how these LORS will be complied with.

There are at least two other circumstances under which a facility closure can occur, unexpected temporary closure and unexpected permanent closure. Staff has not identified any LORS from a land use perspective with which the applicant would have to comply in the event of unexpected temporary closure or unexpected permanent closure.

MITIGATION

Staff's proposed conditions of certification will ensure that the project will comply with the Shasta County General Plan and Zoning Ordinance. The requirements will mitigate any potential land use impacts to a less than significant level.

CONCLUSIONS AND RECOMMENDATION

CONCLUSIONS

The project will comply with all applicable land use laws, ordinances, regulations and standards with the exception of the height limit of 45 feet. However, because the Shasta County Planning Division has stated that the County would grant an exemption to this requirement with the inclusion of visual mitigation measures, the project would be allowed.

With the possible exception of effects on McArthur-Burney Falls Memorial State Park, the proposed project would be compatible with existing and planned land uses because: 1) the project is compatible with the heavy industrial character of the site; 2) the project would not physically divide an established community; 3) the project would not substantially preclude or restrict existing land uses; 4) the project would not preclude or restrict any planned land uses; and 5) the project, with mitigation, would not cause any significant dust, noise, traffic, or visual impacts. The project would not contribute substantially to any cumulative land use impacts.

RECOMMENDATION

If the Energy Commission certifies the TMPP project, staff recommends that the Commission adopt the following proposed conditions of certification.

CONDITIONS OF CERTIFICATION

LAND-1 The project owner shall comply with the Shasta County Zoning Ordinance site development standards for the general industrial (M) district (Chapter 17.58.050).

Protocol: The project owner shall submit to the CEC Compliance Project Manager (CPM) for review and approval a site plan that indicates how the development standards listed in the section will be met. The submittal shall include evidence that Shasta County has reviewed the plans and shall attach and address any recommendations from Shasta County. The project owner shall not implement the plans until approved by the CPM.

Verification: At least 60 days prior to the start of construction of the proposed project, the project owner shall submit the site plans to the CPM for review and approval.

LAND-2 Prior to final approval of any proposed land division to create a separate parcel for the Burney Mountain Power Plant allowed by Shasta County Use Permit Number 3-83, the project owner shall ensure that the plot plan and conditions of UP 3-83 are changed as appropriate to reflect the proposed plant and/or property segregation.

Verification: The project owner shall ensure that the revised plot plan and conditions of UP 3-83 are filed with Shasta County and shall provide evidence of the filing with the CPM.

LAND-3 The project owner shall place a screened cyclone fence with a six foot minimum height along the northern property line adjacent to the property within the Timber Production (TP) district in accordance with the Shasta County rural zone wall requirement (Zoning Plan Section 17.84.070). The fence shall be completed prior to final building permit inspection.

Verification: Verification: At least 30 days prior to final building permit inspection, the project owner shall submit to the CPM evidence that the fence has been constructed. Within seven (7) days after receiving written notification of the results of the final building inspection, the project owner shall submit the results to the CPM.

LAND-4 The project owner shall provide an improved parking area in accordance with Shasta County Ordinance Code Section 17.86. Improvements shall be completed prior to final building inspection.

Protocol: The project owner shall provide a parking plan showing space location, dimensions and total number of spaces. A minimum of 25 spaces

shall be provided based on 1 space per employee and a maximum of 25 employees proposed.

The parking area and access shall be improved to the following standard:

a. Surfaced with asphalt concrete paving. Asphalt concrete paving shall be type "B: with a minimum thickness of 0.14 feet placed over at least six (6) inches of compacted class 3 aggregate base or cinders.
b. Parking areas shall be striped.

All other internal access roads and driveways shall be surfaced with a minimum of four (4) inches of compacted "Class 3" aggregate base or cinders and maintained in a dust free condition.

Verification: At least 60 days prior to the start of construction of the project, the project owner shall submit the parking plan to the CPM for review and approval. The submittal to the CPM shall include evidence that the plan has been reviewed by Shasta County and shall include any recommendations from Shasta County.

At least 30 days prior to final building permit inspection, the project owner shall submit to the CPM evidence that the parking plan has been implemented.

LAND-5 The property is located in an agricultural/timber use area and may be subject to impacts from the conduct of existing and future agricultural/timber related activities that may be considered objectionable. The project owner shall provide any prospective purchaser with a copy of Shasta County Ordinance No.94-2 and shall comply with the disclosure provisions of that ordinance.

Verification: As part of any petition to the Energy Commission to transfer ownership of the project parcel the project owner shall provide a statement from the prospective purchaser that the project owner has satisfied this condition.

REFERENCES

Burney Resource Group 2000. Comments of Staff Assessment. January 10, 2000.

California Regional Water Quality Control Board 2000. Central Valley Region. Letter from James C. Pedri, Assistant Executive Officer, Shasta Cascade Watershed, to Andrew F. Washington, Ogden Power Pacific, Inc. January 4, 2000.

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Kaminski, Scott. 2000. Associate Planner, Shasta County Department of Resource Management. Telephone conversation with Gary D. Walker, California Energy Commission staff, January 12, 2000.

Nelson, David A., 1999. Park Superintendent, Cascade Sector, California Department of Parks and Recreation. Statement at Status Conference and Hearing on Motions, Three Mountain Power Project, December 20, 1999.

SHASTA CO (Shasta County/Kaminski) 1999a. Shasta County Recommended Conditions of Approval (Attachment: Proof of Service). Submitted to the California Energy Commission on October 12, 1999.

SHASTA CO (Shasta County/Kaminski) 2000. Comments on the Preliminary Staff Assessment for the Three Mountain Power Project. January 3, 2000.

Shasta County 1998. General Plan. October.

Shasta County 1999. Zoning Plan. August.

TMPP (Three Mountain Power Project/McFadden) 1999a. Submittal of the Three Mountain Power Application for Certification. Submitted to the California Energy Commission on March 3, 1999.

TMPP (Three Mountain Power Project/McFadden) 1999b. Additional information for AFC; Instructions for Replacement Pages, Maps and Charts. Submitted to the CEC on June 4, 1999.

White & Case/Cottle 1999a. Response of Three Mountain Power LLC to Staff's Data Request Numbers 2 – 9 and Data Request Numbers 13 – 43

(Attachment: Proof of Service) Submitted to the California Energy Commission on September 3, 1999.

White and Case/Cottle 2000. Comments of Three Mountain Power, LLC on the Preliminary Staff Assessment. Submitted to the CEC on January 7, 2000.

TRAFFIC AND TRANSPORTATION

Testimony of Steven J. Brown, P.E.

INTRODUCTION

The Traffic and Transportation section of the Preliminary Staff Assessment addresses the extent to which the project may impact the transportation system within the vicinity of its proposed location. This section summarizes the separate analyses by both the Three Mountain Power Project, Limited Liability Company (applicant), in the Application for Certification (AFC) and the Energy Commission staff (staff) of the potential traffic and transportation impacts associated with construction and operation of the Three Mountain Power Project (TMPP).

These analyses included the evaluation of the influx of large numbers of construction workers, and how, over the course of the construction phase, they can increase roadway congestion and also affect traffic flow. The underground natural gas and water supply pipeline alternatives are proposed to cross or be located along public right-of-ways requiring trenching or other activities disruptive to traffic flows. In addition, the transportation of large pieces of equipment can increase roadway congestion and increase traffic hazards. There are no permanent changes proposed to the existing transportation network or its use after completion of construction. On-going (post construction) operations and maintenance traffic will be minimal; however, it can include a slight increase in the transportation of hazardous materials to the project site. In all cases, the transportation of hazardous materials will need to comply with federal and state laws.

Staff has used this information to determine the potential for the TMPP to have significant traffic and transportation impacts, and to assess the availability of mitigation measures that could reduce or eliminate those impacts. Conditions of certification are included to implement the appropriate mitigation measures and to ensure that the project complies with the applicable Laws, Ordinances, Regulations, and Standards (LORS).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

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

Sections 171-177 govern the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles.

Sections 350-399, and Appendices A-G, Federal Motor Carrier Safety Regulations, address safety considerations for the transport of goods, materials, and substances over public highways.

STATE

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

- California Vehicle Code, Section 353, defines hazardous materials. California Vehicle Code, Sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- California Vehicle Code, Sections 31600-31620, regulates the transportation of explosive materials.
- California Vehicle Code, Sections 32000-32053, regulates the licensing of carriers of hazardous materials and includes noticing requirements.
- California Vehicle Code, Sections 32100-32109, establishes special requirements for the transportation of inhalation hazards and poisonous gases.
- California Vehicle Code, Sections 34000-34121, establishes special requirements for the transportation of flammable and combustible liquids over public roads and highways.
- California Vehicle Code, Sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-7, 34506, 34507.5 and 34510-11, regulates the safe operation of vehicles, including those which are used for the transportation of hazardous materials.
- California Health and Safety Code, Sections 25160 et seq., addresses the safe transport of hazardous materials.
- California Vehicle Code, Sections 2500-2505, authorizes the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials, including explosives.
- California Vehicle Code, Sections 13369, 15275, and 15278, addresses the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, it requires the possession of certificates permitting the operation of vehicles transporting hazardous materials.
- California Streets and Highways Code, Sections 117 and 660-72, and California Vehicle Code, Sections 35780 et seq., require permits for the transportation of oversized loads on county roads.
- California Streets and Highways Code, Sections 660, 670, 1450, 1460 et seq., 1470, and 1480, regulates right-of-way encroachment and the granting of permits for encroachments on state and county roads.

The Caltrans' Route Concept Report for State Route 299 includes the following policies which are pertinent to the congestion attributable to the proposed project:

- Caltrans shall strive to maintain a minimum Level of Service C during peak hour traffic operations.

All construction within the public right-of-way will need to comply with the "Manual of Traffic Controls for Construction and Maintenance of Work Zones" (Caltrans, 1996).

LOCAL

SHASTA COUNTY

The Shasta County General Plan, in its transportation and circulation element, includes the following policies which are pertinent to the proposed project:

New commercial and industrial development accessing arterials and collectors shall provide access controls for public safety by means such as limiting the location and number of driveway access points and controlling ingress and egress turning movements.

Discretionary uses located in areas designated Mixed Use (MU), Commercial (C), or Industrial (I) shall be served by a paved road. The County shall obtain street right-of-way dedications with the approval of subdivisions, use permits, and other discretionary actions. All other non-residential discretionary uses not located in a General Plan area described above, excepting resource designations, shall ultimately be served by a paved road, unless deferred or waived, based on traffic generation factors.

Adequate truck assess to off-street loading areas in commercial and industrial areas shall be provided in all new development applications.

Project proponents shall be required to implement effective measures included in the County's lists of Standard Mitigation Measures (SMM) and Best Available Mitigation Measures (BAMM) to reduce vehicle use and associated emissions related to existing and future land use development as part of the environmental review process.

The Shasta County Public Works Department requires a transportation permit for oversized vehicles using a county road (see also California Streets and Highways Code section above) and an encroachment permit for any encroachment in any county roadway (see California Streets and Highways Code above).

SETTING

REGIONAL DESCRIPTION

STATE HIGHWAYS AND LOCAL ROADWAYS

State Routes 89 and 299 provide regional and local access to the TMPP site.

State Route 89 is a two-lane, north/south facility located approximately five miles north of the TMPP site. Near the intersection with State Route 299, State Route 89 carries approximately 3,000 vehicles per day during the peak month (month of heaviest traffic flow).

State Route 299, in the vicinity of the TMPP site, is a two-lane undivided highway ranging in width from 22 to 48 feet without any weight restrictions between I-5 and State Route 89. The section of State Route 299 east of the TMPP site through Johnson Park is a four-lane undivided highway. Near the TMPP site, State Route 299 carries approximately 5,700 vehicles per day during the peak month (month of heaviest traffic flow). Vehicular access to the TMPP site is currently provided along State Route 299 via Energy Drive. The TMPP will maintain this vehicular access point. Energy Drive will continue to serve as the single access driveway as shown on Figure 2.1-2 in the Application for Certification.

ACCIDENT HISTORY

The most recent three-year (April 1996 through April 1999) accident history for State Route 299 in the vicinity of Energy Drive was reviewed to determine annual accident rates. State Route 299, between post mile 76.181 and 78.649, has a "fatal-plus-injury" and "total" accident rate below the statewide average for similar State Highway segments. The actual accident rates are 0.29 (fatal-plus-injury) and 0.73 (total) compared to statewide average rates of 0.80 (fatal-plus-injury) and 1.60 (total). No fatal accidents were reported along the highway segment during the three-year analysis period.

RAILWAYS

The McCloud River Railway Company operates a single track short line connecting the cities of McArthur and Burney; however, this rail line does not cross State Route 299. The McCloud Railway does cross State Route 89 north of State Route 299. This at-grade crossing is equipped with railroad grade crossing warning equipment.

PUBLIC TRANSPORTATION

The only public transportation service provided in the vicinity of the TMPP site is an interregional bus line called the Burney-Redding Express Route. Service is provided two times daily, Monday through Friday, departing Burney at 6:00 AM and 12:00 PM (noon). The buses stop at Holiday Market on Main Street in Burney.

SITE AND VICINITY DESCRIPTION

The operating conditions of a roadway system are described using the term "level of service". Level of service (LOS) is a description of a driver's experience at an intersection or roadway based on the level of congestion (delay). However, it is not a measure of safety or accident potential. Intersection and roadway conditions can range from LOS A, representing free-flow conditions with little or no delay, to LOS F, representing saturated conditions with substantial delay. A LOS C threshold, as noted above, is the minimum condition deemed acceptable by Caltrans for State Route 299. This level of service standard is also generally considered appropriate for rural areas.

Tables 6.5-1 and 6.5-2 in the AFC summarize the LOS criteria and existing traffic volumes of the principal roadways in the project area. All local roadways are operating at LOS C or better. Field observations confirmed the lack of delays caused by congestion.

IMPACTS

POWER PLANT

CONSTRUCTION PHASE

COMMUTE TRAFFIC

Table 2.1-12 in the AFC summarizes the overall TMPP construction staffing schedule. The construction schedule is based on a single-shift, eight-hour day, five-day work week. The construction workforce will peak at approximately 400 persons (including engineering staff) and average about 200 persons over a 22-month period. Staff concludes that the majority of the construction workforce will likely come from the local labor pool in the Redding area. As a result, State Route 299 is likely to be the principal commute route. Construction workers will park on site, although no specific location is given in the AFC.

Tables 6.5-3a, 6.5-3b and 6.5-3c in the AFC summarize the daily and peak hour construction traffic generation. Tables 6.5-4a, 6.5-4b and 6.5-4c in the AFC summarize the daily and peak hour construction traffic volumes on State Routes 89 and 299. Table 6.5-4d in the AFC summarizes the daily and peak hour operation traffic volumes on State Routes 89 and 299.

Tables 6.5-5a, 6.5-5b, and 6.5-5c in the AFC summarize the TMPP construction condition LOS. During peak construction periods, the following sections of State Route 299 would operate at a level worse than Caltrans' LOS C significance threshold:

- State Route 299 between Tamarack Road and Plumas Street
- State Route 299 between Plumas Street and Black Ranch Road
- State Route 299 between Black Ranch Road and Energy Drive

TMPP construction activities would also add a significant amount of traffic at the intersection of State Route 299 and Energy Drive, the access driveway. The analysis contained in the AFC indicates that, during peak construction periods, the intersection would operate at an acceptable LOS. A queuing analysis was completed in the AFC to determine the maximum expected queue for the northbound left-turn approach at the intersection. This analysis indicated a maximum queue of two vehicles. However, the description of the number of trips created by construction worker and materials delivery was incomplete and, in some cases, contradictory. The actual maximum queue may be as high as four.

Assuming that these vehicles are all trucks, the maximum queue length would be approximately 200 feet. The increase in traffic volumes will not warrant a traffic signal.

In consultation with Caltrans and Shasta County, the applicant should prepare a construction traffic control plan and a construction traffic management plan that will address commuter peak periods. The development and implementation of a traffic control plan will primarily address the safety of travel to/from the site. The plan may result in reduced travel or travel outside the peak hours (by shifting to alternative times). However, the degree of travel reduction or time shift is not known and would unlikely significantly change travel patterns because of the nature of construction activities. In addition, the applicant should provide a northbound left turn lane on State Route 299 at Energy Drive. This lane should extend at least 100 feet and comply with Caltrans Design Standards.

Proposed condition of certification **TRANS-4** would require the installation of the left turn lane in advance of project construction. The time needed to accomplish the design work, receive approval for the design, award a contract for construction and complete the construction is estimated to be approximately 12 months. Assuming the design work was done prior to certification, approximately eight months would be needed to complete the turn lane addition prior to start of construction of the TMPP. To satisfy the proposed condition of certification that requires completion of installation of a left-turn lane at least 15 days prior to start of construction, the applicant will want to immediately begin the steps identified in TRANS-4, namely to: 1) submit an updated queuing analysis to Caltrans to obtain their approval of the pocket length, 2) submit design drawings and an encroachment permit, and 3) work with Caltrans to obtain the permit. The project CPM should be included in all communications regarding the above.

TRUCK TRAFFIC

The transportation and handling of hazardous substances associated with the project can increase roadway hazard potential. The handling and disposal of hazardous substances are addressed in the Waste Management section and the Hazardous Materials section of this report. Potential impacts of the transportation of hazardous substances can be mitigated to insignificance by compliance with federal and state standards established to regulate the transportation of hazardous substances. Conditions of certification that ensure this compliance are discussed later in this analysis.

Transportation of equipment exceeding the load size and weight limits of any roadways will require special permits. The procedures and processes for obtaining such permits are fairly straightforward. Mitigation measures and conditions of certification that ensure this compliance are discussed later in this section.

Finally, product deliveries via truck traffic will produce localized impacts. While such traffic will average 745 trips per day, during peak construction, such activities as concrete pouring can require sufficient traffic to produce a noticeable impact on local roadways. Depending upon the timing of deliveries during the day there can

be localized traffic related noise and conflict with local traffic patterns. In consultation with Shasta County, the applicant shall prepare a construction traffic control plan and a construction traffic management plan that will address truck deliveries during peak periods. The addition of 745 heavy vehicle trips per day during peak construction could damage the roadbed of State Route 299 and would need to be repaired by the applicant. Conditions of certification that ensure this compliance are discussed later in this analysis.

RAILWAYS

The McCloud River Railway crosses State Route 89 north of State Route 299 at a controlled location (gates and signals). The applicant is proposing to use the railroad during the construction of the TMPP to deliver heavy equipment, but no hazardous materials. The applicant estimates a total of 10 trips on the railway, which will not create any impacts. The TMPP will add approximately 68 trips per day to the crossing at State Route 89, which will not create any impacts.

OPERATIONAL PHASE

COMMUTE TRAFFIC

The operational phase of the TMPP will generate a total of approximately 100 daily vehicle trips. This will not create any significant traffic problems.

TRUCK TRAFFIC

The transportation and handling of hazardous substances associated with the TMPP can increase roadway hazard potential. The handling and disposal of hazardous substances are addressed in the Waste Management section and the Hazardous Materials section of this report. Potential impacts of the transportation of hazardous substances can be mitigated to insignificance by compliance with Federal and State standards established to regulate the transportation of hazardous substances. Mitigation measures and conditions of certification that ensure this compliance are discussed later in this analysis (TRANS-3).

Product deliveries via truck traffic can produce localized impacts. While such traffic will average 20 trips per day, this will not present any noticeable impact on local roadways.

LINEAR FACILITIES

Construction of the transmission lines is not expected to occur within the public right-of-way and is not expected to cause any traffic impacts.

The construction of the underground natural gas pipeline alternatives from the PG&E natural gas transmission line to the TMPP could increase congestion for all roadways in which trenching is required within the established right-of-way. However, such impacts will be short-term and not significant. Typically plating of roadways will be used to ensure emergency vehicle access and maintain reasonable levels of traffic flow. Use of typical signals, signs, or warnings will also notify motorists of construction activity. Any exceptional need for traffic control and

signing for this area will be addressed in the construction traffic control plan as specified in the proposed conditions of certification. In all cases, construction within the public right-of-way will need to comply with Caltrans "Manual of Traffic Controls for Construction and Maintenance of Work Zones" (Caltrans 1996).

The construction of the underground water supply pipeline alternatives from the Burney Water District to the TMPP could increase congestion for all roadways in which trenching is required within the established right-of-way. Any exceptional needs for traffic control and signing for this area will be addressed in the construction traffic control plan as specified in the proposed conditions of certification. In all cases, construction within the public right-of-way will need to comply with Caltrans "Manual of Traffic Controls for Construction and Maintenance of Work Zones" (Caltrans 1996).

If either natural gas or water supply facilities are being constructed within or adjacent to a public roadway, then the traffic control plan should include provisions such that at least one lane of traffic flow is maintained in each direction or traffic flow is alternated by direction using flagmen.

The operation of such facilities will not have an impact on area roadways except for short-term maintenance or unplanned difficulties. In either case, the impacts create traffic flow difficulties that are typically limited in duration and not significant.

CUMULATIVE IMPACTS

Staff is not aware of any development proposals imminent in the vicinity of the TMPP**.** However, the regional area will likely continue to experience development. Consequently, traffic volumes on State Routes 89 and 299 will likely increase. The TMPP's level of traffic generation will diminish between the construction and operational phases such that an increase in background traffic should not be problematic.

FACILITY CLOSURE

The anticipated lifetime of the power plant is expected to be in excess of thirty years. At least twelve months prior to the proposed decommissioning, the applicant shall prepare a Decommissioning Plan for submission to the Energy Commission for review and action, at least twelve months prior to the proposed decommissioning. At the time of closure all then-applicable LORS will be identified and the closure plan will address how these LORS will be complied with. The effects of project closure on traffic and transportation will be similar to those discussed for the project itself. Closure will create traffic levels that are similar in intensity and duration to those expected during facility construction. The removal of waste and other materials will produce impacts from truck traffic. At this time, no conclusions can be drawn on the effects of project closure on traffic and transportation.

MITIGATION

The applicant has indicated its intention to comply with all LORS relating to the transport of oversized loads and the transport of hazardous materials. The applicant shall also: 1) prepare a construction traffic control plan and implementation program, and 2) design and construct a northbound left turn lane on State Route 299 at Energy Drive. In addition, the applicant will be committed to repairing roadways to original condition after construction is completed. The applicant shall also manage the on-site construction-period parking. Staff has incorporated these measures into the proposed conditions of certification and is not requiring additional mitigation for traffic and transportation impacts.

COMPLIANCE WITH LORS

FEDERAL

The applicant has stated its intention to comply with all federal LORS. A condition to ensure compliance is included below. Therefore, the project is considered consistent with identified Federal LORS.

STATE

The applicant has stated its intention to comply with all state LORS. A condition to ensure compliance is included below. Therefore, the project is considered consistent with identified state LORS.

LOCAL

For operational employees, trip reduction measures could be employed. But, since the maximum number of employees assigned to any one shift is 25 full-time employees, trip reduction measures for this project will have an insignificant benefit.

CONCLUSIONS AND RECOMMENDATIONS

POWER PLANT

1. During the construction phase, increased roadway demand resulting from the daily movement of workers and materials will increase congestion, causing service levels to be worse than the standards established by local and regional authorities.
2. During the operational phase, increased roadway demand resulting from the daily movement of workers and materials will be minimal.
3. All transportation and handling of hazardous substances can be mitigated to insignificance by compliance with federal and state standards established to regulate the transportation of hazardous substances.

4. Construction activities have the potential to damage local roadways. The applicant will be required to repair damaged roadways to their original condition.
5. Construction workers will park on-site. No information is provided in the AFC regarding where the workers would park.

LINEAR FACILITIES

Because their construction requires trenching within public road rights-of-way, the underground natural gas and water supply lines will impact both roadway function and levels of service. However, these impacts are expected to be short-term and not result in significant traffic and transportation impacts. The applicant will prepare a traffic control plan, which is contained within the Conditions for Certification. In addition, all development will take place in compliance with California Department of Transportation and Shasta County limitations for encroachment into public rights-of-way.

CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall comply with California Department of Transportation (Caltrans) and Shasta County limitation on vehicle sizes and weights. In addition, the project owner or their contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions.

Verification: The project owner shall submit copies of any oversize and overweight transportation permits received during that reporting period in the Monthly Compliance Report. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file until the start of commercial operation and for at least six months from the date of issuance.

TRANS-2 The project owner or their contractor shall comply with California Department of Transportation (Caltrans) and Shasta County limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

Verification: The project owner shall submit copies of any encroachment permits received during that reporting period in the Monthly Compliance Report. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months from the date of issuance.

TRANS-3 The project owner shall ensure that all federal and state regulations for the transport of hazardous materials are observed during both construction and operation of the facility.

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

TRANS-4 Prior to the start of construction, the project owner shall install a northbound left-turn lane on State Route 299 at Energy Drive in accordance with Caltrans design standards. The project owner shall submit design plans for the left-turn lane to Shasta County and Caltrans for review and comment, and to the Energy Commission Compliance Project Manager (CPM) for approval.

Protocol: The project owner shall consult with Shasta County and Caltrans and submit an updated queuing analysis, to the satisfaction of Shasta County and Caltrans, identifying the needed length of the pocket, to Shasta County, Caltrans and the CPM.

Verification: At least 15 days prior to start of construction of the TMPP, the project owner shall inform Shasta County, Caltrans and the CPM that the northbound left-turn lane is ready for inspection.

TRANS-5 Prior to the start of construction, the project owner shall consult with Shasta County and Caltrans and:

Prepare a construction traffic control plan and implementation program addressing the following issues:

- timing of heavy vehicle equipment and building materials deliveries;
- signing, lighting, and traffic control device placement;
- establishing construction work hours outside of the peak traffic periods;
- emergency access;
- temporary travel lane closures;
- maintaining access to adjacent residential and commercial properties; and
- off-street employee parking during construction.

Verification: At least thirty days prior to start of construction, the project owner shall provide to Shasta County and Caltrans for review and comment, and to the CPM for review and approval, a copy of their construction traffic control plan and implementation program.

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

Protocol: Prior to start of construction, the project owner shall photograph State Route 299 from Energy Drive to Tamarack Road and sections of public roadways that will be affected by gas or water pipeline construction. The project owner shall provide the CPM, Shasta County and Caltrans with a copy of these photographs. Prior to start of construction, the project owner

shall also notify Caltrans about the schedule for project construction. The purpose of this notification is to postpone any planned roadway resurfacing and/or improvement projects until after the TMPP construction has taken place and to coordinate construction related activities associated with other projects.

Verification: Within 30 days of the completion of project construction, the project owner will meet with the CPM, Shasta County and Caltrans to determine and receive approval for the actions necessary and a schedule to complete the repair of State Route 299 from Energy Drive to Tamarack Road and other identified sections of public roadways to original or as near original condition as possible.

TRANS-7 Prior to start of construction, the project owner shall prepare and submit a parking and staging plan for all phases of project construction to Shasta County for review and comment and to the CPM for approval. During construction of the power plant and all related facilities, the project owner shall manage the on-site construction-period parking.

Verification: At least sixty days prior to start of construction, the project owner shall submit the parking and staging plan to Shasta County for review and comment, and to the CPM for approval.

REFERENCES

California Department of Transportation (Caltrans), 1997 Traffic Volumes on California State Highways, June 1998.

California Department of Transportation (Caltrans), TASAS Table B District 2 Selective Accident Rate Calculation, October 1999.

California Department of Transportation (Caltrans), Route Concept Report for State Route 299, October 1984.

California Department of Transportation (Caltrans), Traffic Manual, Chapter 5, Traffic Controls for Construction and Maintenance Work Zones. January 1996.

Shasta County, Shasta County General Plan, 1998.

Shasta County Regional Transportation Planning Agency, Shasta County Regional Transportation Plan, December 1998.

Shasta County Regional Transportation Planning Agency, Shasta County Regional Transportation Implementation Plan, December 1997.

TMPP 1999a, Application for Certification, Three Mountain Power Plant Project. Submitted to the California Energy Commission, March 3, 1999.

TMPP 1999b, Additional Information for its Application for Certification, Three Mountain Power Plant Project. Submitted to the California Energy Commission, June 3, 1999.

NOISE

Testimony of Kisabuli

INTRODUCTION

The construction and operation of any power plant creates noise, or unwanted sound. The character and loudness of this noise, the times of day or night during which it is produced, and the proximity of the facility to sensitive receptors combine to determine whether a proposed project will meet applicable noise control laws and ordinances, and whether it will exhibit significant adverse environmental impacts.

The purpose of this analysis is to identify the likely noise impacts from the Three Mountain Power Project (TMPP) and to recommend conditions to ensure that the resulting noise impacts will comply with all applicable laws, ordinances, regulations and standards.

Before certifying the TMPP, the Energy Commission must find that the project:

1. will likely be built and operated in compliance with all applicable noise laws, ordinances, regulations and standards; and
2. will present no significant adverse noise impacts, or none that have not been mitigated to the extent feasible.

For a description of the terms used to describe noise and methods to measure and evaluate noise, please see **"NOISE: Appendix A"**.

This analysis is based, in part, on information provided in the Application for Certification (AFC) (TMPP 1999a), Supplemental Filings (TMPP 1999b), site visits, workshops, staff data requests and applicant responses (TMPP 1999c - h), and discussions with other agency representatives.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Under the Occupational Safety and Health Act of 1970 (29 USC § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 CFR § 1910.95) that establish maximum noise levels to which workers at a facility may be exposed. These OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time during which the worker is exposed. (Please see **Noise: Appendix A, Table A4** immediately following this section.) OSHA regulations also dictate hearing conservation program requirements and workplace noise monitoring requirements. The administering agency for the above authority is the Federal Occupational Safety and Health Administration (Fed-OSHA).

Noise Control Act of 1972 (42 USC § 4901 et seq.; 40 CFR Parts 201-211) sets performance standards for noise emissions from "major sources." The Environmental Protection Agency (EPA) has identified a day/night level (Ldn) of 55 dBA[1] as providing reasonable protection against community annoyance and activity interference due to noise. EPA administers the Noise Control Act.

STATE

There are no state regulations governing off-site (community) noise. Rather, state planning law (Gov. Code, § 65302) requires that all counties and cities prepare and adopt a General Plan. Government Code section 65302(f) requires that a noise element be prepared as part of the General Plan. This element is to "address existing and foreseeable noise problems…." Other state laws, ordinances, regulations and standards (LORS) include the California Environmental Quality Act (CEQA) and the California Occupational Safety and Health Act (Cal-OSHA).

California Vehicle Code, sections 23130 and 23130.5, sets noise limits for highway vehicles. The California Highway Patrol and the Shasta County Sheriff's Office administer the vehicle code.

CAL-OSHA

California Occupational Safety and Health Administration (Cal-OSHA) has promulgated Occupational Noise Exposure Regulations that set employee noise exposure limits.

Cal-OSHA regulations (Cal. Code Regs., tit. 8, § 5095 et seq.) are the same as the federal OSHA criteria described above. The criteria are based on a worker's noise level exposure over a specific time period. Maximum permissible worker noise exposure levels to protect against damage to the workers' hearing have been established. The administering agency is Cal-OSHA.

CEQA

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

1. Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
2. Exposure of persons to, or generation of, excessive ground borne vibration or ground borne noise levels.
3. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

[1] Please see **Noise: Appendix A,** immediately following this section, for the definition of dBA and other terms used throughout this report.

4. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

LOCAL

SHASTA COUNTY GENERAL PLAN - NOISE ELEMENT

The Shasta County General Plan 1998 contains a Noise Element that establishes environmental noise limits based on the land use of the property receiving the noise. The permissible noise levels are outlined below in **NOISE: Table 1**. The administering agency for the above authority is the Shasta County Department of Planning and Development Services.

SETTING

The site is located directly west of State Route 299, approximately one-mile northeast of Burney and one-half mile southwest of Johnson Park in Shasta County, California. The site is bounded by forested open space to the north and south, open space and State Route 299 to the east, and the McCloud River Railway to the west. The site is generally level, located at approximately 3,140 feet above mean sea level (MSL).

The nearest sensitive receptor is a single-family residence located approximately 1,400 feet due west of the property boundary, on Black Ranch Road. Several residences in the southern limits of Johnson Park are located approximately 1,800 feet northwest of the property boundary. The nearest schools to the site include an elementary and junior/senior high school in the town of Burney. These schools are located approximately 1.5 miles south of the property. The majority of the lands surrounding the site consist of natural open space. Direct access to the site is provided via State Route 299.

There are sensitive receptors (schools, residences and places of worship) within a 2-mile radius of the powerplant site. This is identified by staff as an area inside which construction and operation of a powerplant project is likely to cause noise impacts. Since sensitive receptors are within a 2-mile radius, mitigation measures are likely to be required to minimize noise impacts to these sensitive receptors.

For additional information regarding the site, setting and other project features, please see the Project Description section.

NOISE: Table 1
Shasta County General Plan-Noise Element

Table N-1 Noise level performance standard for new projects Affected by or including non-transportation sources.		
Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly L_{eq}, dBA	55	50
The noise levels specified above shall be lowered by five (5) dBA for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings). The County can impose noise level standards, which are more restrictive than those specified above based upon determination of existing low ambient noise levels. In rural areas where large lots exist, the exterior noise level standard shall be applied at a point 100 feet away from the residence.		
HVAC Systems Pump Stations Emergency Generators/Boilers Steam Valves Generators Air Compressors Conveyor Systems Pile Drivers Drill Rigs Welders Outdoor Speakers	Cooling Towers/Evaporative Condensers Lift Stations Steam Turbines Fans Heavy Equipment Transformers Grinders Gas or Diesel Motors Cutting Equipment Blowers	
The types of uses which may typically produce the noise sources described above include but are not limited to: industrial facilities including lumber mills, trucking, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfill, sand and gravel operations, and athletic fields. Note: For the purposes of the Noise Element, transportation noise sources are defined as traffic on public railroads, railroad lines and aircraft in flight. Federal and State regulations preempt control of the noise from these sources. Other noise sources are presumed to be subject to local regulations, such as a noise control ordinance. Non-transportation noise sources may include industrial operations, outdoor recreational facilities, HVAC units, loading docks etc.		

Source: 1998 Shasta County General Plan - Noise Element.

AMBIENT NOISE SURVEY

The Energy Commission's power plant certification regulations require that noise measurements be made at noise-sensitive locations where there is a potential for an increase of 5 dBA or more over existing background noise levels during construction or operation of a proposed power plant.

The applicant performed noise measurements between November 6 and November 8, 1998. Data was collected for approximately 48 hours at each of the three locations and additional spot sampling was performed at five other locations. All sound measurement equipment was calibrated before and after completion of the noise measurement. Results of the 48-hour sound level monitoring are shown on

(**NOISE:** Table 2) and results of the spot sound level monitoring are shown on (**NOISE:** Table 3) below.

NOISE: Table 2
48-Hour Average Ambient Sound Levels

48-Hour Average Sound Level Descriptors (dBA)								
Site	L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}	L_{dn}	CNEL
ML 1	58.2	76.3	40.3	63.5	52.5	43.0	60.3	60.6
ML 2	59.5	83.9	41.0	60.7	47.6	42.8	64.2	64.4
ML 3	63.2	94.8	43.2	64.2	52.9	47.7	64.2	64.3

Monitoring Locations: ML 1: Southeastern corner of the Burney Mountain Power facility at State Route 299 E and Energy Drive. ML 2: Front yard area of the Hathaway residence located at 21305 Black Ranch Road. ML 3: Southwestern corner of the California Department of Forestry Fire Station located at 37966 State Route 299. (Source: TMP 1999a, AFC § 6.4.2.2 and Table 6.4-4).

NOISE: Table 3
Intermittent Ambient Sound Levels

Site	Start Time	L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
ML 1	8:00 a.m.	61.3	73.5	45.0	62.5	52.5	49.0
ML 2	9:30 a.m.	60.8	74.0	43.0	59.0	56.0	51.0
ML 3	11:00 a.m.	53.4	66.5	42.5	55.5	50.5	45.5
ML 4	12:30 p.m.	56.6	71.5	43.5	59.5	53.5	49.0
ML 5	2:00 p.m.	44.4	60.5	42.0	49.0	45.5	44.0

Monitoring Locations: ML 1: Jacobs residence at 21714 N Vallejo Street. ML 2: Keeps residence at 38068 State Route 299. ML 3: Polley residence at 37497 Mountain View Road. ML 4: First Baptist Church of Burney at 20428 Poplar Street. ML 5: Baker residence at 37127 Serpentine Lane. (Source: TMP 1999a, AFC § 6.4.2.2 and Table 6.4-5).

SIGNIFICANCE CRITERIA

The most stringent noise limitation required by any of the applicable LORS will be the controlling criterion in the design of the noise control features of the project. In this case, the most stringent criterion is the nighttime noise level (L_{eq}) of 50 dBA as specified in the Shasta County General Plan. The level is applicable 100 feet from the nearest residence approximately 1,800 feet from the site.

The significance of a noise impact is also a function of the change or increase in noise levels over existing ambient noise levels at any noise-sensitive receptor. A project related increase of 5 dBA or greater is considered significant by Energy Commission staff.

ENVIRONMENTAL NOISE IMPACTS

Noise will be produced at the powerplant site during the operation of the project and at the power plant site and along the corridors for linear project features during the construction phase. This assessment includes impacts from both construction and operation activities and their potential effects at the nearest sensitive receptors, and to power plant operations personnel. An essential part of this assessment is a

comparison of expected noise levels with acceptable noise levels presented in applicable LORS, and with existing background levels at noise-sensitive receptors.

CONSTRUCTION NOISE

POWER PLANT

Typical construction noise levels generated by equipment at the project site are given in (**NOISE:** Table 4) below. The equipment type, equipment source level range (from quiet to poorly maintained), the maximum expected equipment to be used, and the worst-case cumulative effects (i.e., all equipment on at once and in one stationary location) are provided.

NOISE: Table 4
Anticipated Construction Activities
and Resultant Noise Levels

Construction Phase/ Equipment Type	Source Level @ 50 feet (dBA)	Maximum Number Expected	Cumulative Effects (dBA)
Site Clearing and Preparation			
Backhoe	72-92	3	76-96
Front Loader	72-74	3	76-78
Bulldozer	75-95	2	78-98
Backhoe	72-92	2	75-95
Water Truck	82-95	1	82-95
Dump Truck	82-95	4	88-101
Grading/Trenching			
Earth Mover	80-92	5	86-98
Bulldozer	75-95	2	78-98
Compactor	72-75	1	72-75
Backhoe	72-92	2	75-95
Water Truck	82-95	1	82-95
Dump Truck	82-95	4	88-101
Foundation/Building Construction			
Crane	75-88	2	78-91
Pile Driver	94-105	1	94-105
Loader	72-74	1	72-74
Bulldozer	75-95	1	75-95
Concrete Pump	82-84	1	82-84
Haul Trucks	82-95	4	88-101
Site Clean-up			
Bulldozer	75-95	1	75-95
Blade Scraper	80-92	1	80-92
Paving Equipment	86-88	1	86-88
Compactor	72-75	3	76-79
Water Truck	82-95	1	82-95
Haul Trucks	82-95	6	89-102

(Source: TMP 1999a, AFC § 6.4.2.4 and Table 6.4-7)

Major construction phases consist of site clearing and preparation, foundation construction, building and equipment construction, site clearing and facility start-up. Noise emissions will vary with each phase of construction.

Site clearing and preparation will require the use of heavy diesel-powered earthmoving equipment. Foundation construction will primarily involve concrete handling equipment and some earthmoving equipment for backfill. The building and equipment installation will involve mobile cranes, equipment delivery, impact wrenches, and air compressors. Site cleanup and facility startup would generally result in minimal noise emissions.

LINEAR FACILITIES

The natural gas tie-in line and water pipeline will be installed concurrent with the construction of foundations. Construction of these pipelines will involve trenching and installation of the line.

COMMUNITY NOISE EXPOSURE (CONSTRUCTION)

Steam Blows

Typically, the loudest noise, inherent in the construction of all projects incorporating a steam turbine, is created by the steam blows. After erection and assembly of the feedwater and steam systems, the piping and tubing that comprises the steam path has accumulated dirt, rust, scale, and construction debris such as weld spatter, dropped welding rods, and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before connecting the steam system to the turbine, the steam line is temporarily routed to the atmosphere. Steam is then raised in the HRSG or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, is quite effective at cleaning out the steam system piping. A series of short steam blows, lasting two or three minutes each, is performed several times daily over a period of two or three weeks. The applicant anticipates performing the steam blow activities during the daytime hours for a period not to exceed 10 working days. At the end of this procedure, the steam line is connected to the steam turbine, which is then ready for operation.

MITIGATION MEASURES (POWER PLANT)

Uncontrolled steam blow can produce noise levels as loud as 130 dBA at a distance of 50 feet. The applicant proposes to modify the steam blow process by decelerating and de-superheating the steam prior to exiting the vent stack. To further reduce noise, a by-pass stack will be used to direct the steam flow and the noise away from the sensitive receptors. This method should reduce the noise level to approximately 90 dBA at a distance of 50 feet. An additional reduction of 31 dBA is anticipated due to topographic attenuation: Δ Loss = $20\text{Log}_{10}(1{,}800\text{ft}/50\text{ft}_{REF})$ = 31.1dBA. In other words, approximately 31 dBA of noise reduction is expected

between the source and receiver due to topographic (spherical) attenuation. This attenuation results in construction noise levels that will be at or below the current ambient noise levels at the nearest sensitive receptor. Consequently, except for steam blow activity, no mitigation measures are required for construction noise impacts.

With the above mitigation, the nearest sensitive receptor will be subjected to approximately 59 dBA. Staff recommends that such mitigation measures proposed above be used during the steam blow activity. Staff proposes a condition of certification (see proposed Condition of Certification **NOISE-4** below) to assure compliance.

Alternatively, the project owner may elect to employ a new, quieter steam blow process, variously referred to as QuietBlow® or Silentsteam.™ This method uses lower pressure steam over a continuous period of approximately 36 hours. Resulting noise levels reach only about 80 dBA at 100 feet, equivalent to 40 to 45 dBA at the nearest residence. This noise level complies with the Shasta County noise element of the general plan. The applicant proposes to use this new technology (TMP 1999g, Response to Data Request #85). Staff proposes a condition of certification (see proposed Condition of Certification **NOISE-5** below) to assure compliance. Staff also proposes a notification process (see proposed Condition of Certification **NOISE-1** below) to make neighbors aware of impending steam blow activity.

MITIGATION MEASURES (LINEAR FACILITIES)

Noise associated with construction of the electrical transmission tie-in line will be lower than noise associated with construction of the facility, as less equipment will be used. Reconductoring of the PG&E transmission lines will result in minimal noise levels, as the reconductoring will be short-term in any one location and will involve no more equipment than routine line maintenance. One or two locations may be inaccessible by standard access roads; helicopters may be used in these places. Because of the remoteness and inaccessibility of these locations and the absence of sensitive noise receptors, no noise impacts are expected. For noise concerns to biological species, please see the **Biological Resources** testimony.

WORKER NOISE EXPOSURE (CONSTRUCTION)

POWER PLANT AND LINEAR FACILITIES

A reference distance of 50 feet was used in the AFC to evaluate on-site construction noise levels and their potential impacts on workers. The noise levels will vary significantly depending on whether a worker is closer to or conducting a noisy activity, but the L_{eq} levels are projected to average between 75 and 85 dBA during the first four phases of construction. Undoubtedly, some workers will occasionally be exposed to noise levels above 85 dBA[2] during construction. The applicant predicts that construction noise levels will not reach levels that require worker protection, but will put in place the use of engineering controls,

[2] OSHA does not consider noise levels of 85 dBA or less hazardous to employee health.

administrative controls, and hearing protection devices (TMP 1999a, AFC § 6.4.4.2 and AFC page 6.4-29).

To ensure that workers are adequately protected, staff has proposed a condition of certification (see proposed Condition of Certification **NOISE-3**, below).

OPERATIONAL NOISE

POWER PLANT

Unmitigated operation of the proposed facility results in property line noise levels that are considered "conditionally acceptable" according to the Shasta County General Plan. Accordingly, mitigation of key noise generating equipment will be considered. Mitigation in the form of structural enclosure of key power production equipment will be implemented. Primary areas targeted were found to be turbine assemblies and synchronous generators. Application of structural attenuation was found to produce overall noise levels in compliance with applicable threshold criteria and resulted in no residual impacts.

Receptor Identification within 5 dBA Ambient Noise Contours. An examination of the proposed Facility design was performed to ascertain if any sensitive receptors were located within the +5dBA-over-ambient noise contours surrounding the powerplant site. No sensitive receptors were identified within these contours.

The loudest noise generator will be the HRSGs, producing sound level of 71 dBA L_{dn} at the powerplant property line (ML #1). The current ambient level at the site was measured at 60.3 dBA L_{dn} (ML #1). Thus, the proposed project is expected to produce a level of approximately 11 dBA over the current ambient noise. Using a spherical propagation rule, the 71 dBA noise level will attenuate to approximately 42 dBA at 100 feet from the nearest sensitive receptor. This level of noise is not expected to cause impacts that would require additional mitigation.

COMMUNITY NOISE IMPACTS (OPERATION)

During its operating life, the project will represent essentially a steady, continuous and broadband noise source day and night. Occasional short-term increases in noise level will occur as steam relief valves open to vent pressure, or during startup or shutdown as the plant transitions to and from steady-state operation. At other times, such as when the plant is shut down for lack of dispatch or for maintenance, noise levels will decrease.

Expected operational noise levels are shown in (**NOISE:** Table 5). The primary noise sources include: two combustion turbine generators (CTGs) and associated CTG air inlets, two heat recovery steam generators (HRSGs), one steam turbine generator (STG), cooling tower fans, transformer areas, feed pumps (e.g., boiler, return, and circulation), and ancillary switchgear. The major noise emitting sources were modeled to estimate noise levels at the nearest property boundary to the east and west, and the nearest residence.

Noise associated with the CTG air inlets was not modeled because specific estimates of noise generation were not available; however, the CTG air inlets' position in the center of the site away from the site boundary make it unlikely that this source will result in higher property line noise levels than other sources. Furthermore, the air inlets will be configured to minimize noise impacts.

NOISE: Table 5
Expected Resultant Operational
Noise Levels in dBA (Unmitigated)

			Resultant Noise Levels (dBA)		
Equipment	Source Level @50'	Number Used	Nearest Property Line (East)	Nearest Property Line (West)	Nearest Residence
Gas Turbine	85	2	77.9	71.9	61.3
AC Generator	85	3	86.5	69.1	61.3
Cooling Tower Fan	71	8	72.5	68.9	53.3
HRSG	82	2	81.0	65.0	58.3
Steam Turbine	80	1	69.9	63.9	53.2
Transformer Package	72	3	63.9	64.7	50.0
Boiler Pump	74	2	66.9	58.1	50.3
Circulation Pump	72	8	69.9	68.2	54.3
Return Pump	72	2	63.9	62.2	48.3
Switch Yard Gear	65	3	56.9	57.7	43.0
		SUM CNEL (Σ)	88.3	77.0	65.4

(Source: TMP 1999a, AFC § 6.4.3 and Table 6.4-9). Based upon assumed operational equipment

Frequency (Tonal) Characteristics and Intermittent Noises

One possible source of noise annoyance would be strong tonal noises, individual sounds that, while not louder than the permissible levels, stand out in sound quality. To ensure the avoidance of such tonal sound, the noise control design of the TMPP can be balanced to bring as many noise sources as possible to the same relative sound level, causing them all to blend without any one source standing out.

The frequency characteristics associated with the proposed operational equipment are shown in (**NOISE:** Table 6 below). The data shown is representative of individual equipment types and is based upon past field studies.

NOISE: Table 6
Frequency Characteristics of
Proposed Operational Equipment

Equipment	Source Level @ 50 ft. (dBA)	Dominant Frequencies (Hz)						
		125	250	500	1,000	2,000	4,000	8,000
Gas Turbine	85	•		•	•	•		
AC Generator	85			•	•	•	•	
Cooling Tower Fan	71	•	•	•	•			
HRSG	82		•	•	•	•		
Steam Turbine	80	•	•	•	•	•		
Transformer Package	72				•	•		•
Boiler Pump	74	•	•	•				
Circulation Pump	72	•	•	•				
Return Pump	72	•	•	•	•			
Switch Yard Gear	65	•						

(Source: TMP 1999a, AFC § 6.4.3 and Table 6.4-9)

Past studies have shown that the dominant noise generator at a power plant site is the turbine/synchronous generator assembly. The dominant spectral content lies within the 500 to 2000 Hz frequency band. These levels, although audible, would not impair hearing if properly mitigated.

Another potentially annoying source of noise from a power plant is the intermittent or occasional actuation of steam relief valves. The hissing noise from these valves can be largely mitigated by the installation of adequate mufflers. To ensure that adequate measures are taken to mitigate tonal and intermittent noise sources, staff has proposed measures (see proposed Condition of Certification **NOISE-4**, below) to ensure that tonal and intermittent steam relief noises are not allowed to cause a problem.

LINEAR FACILITIES

High voltage transmission lines can produce a hissing sound as a result of corona discharge from the conductors. The noise level is a function of voltage and is most evident at higher voltages. Power lines with voltages less than 230 kV rarely produce an audible corona discharge noise because there is little or no discharge at these lower voltages. The sound from 230 kV lines, as proposed for TMPP, is generally inaudible at distances greater than 50 feet from the conductor bundle except during rainy or high humidity conditions.

A switchyard located at the point of interconnection with the existing 230 kilovolt (kV) transmission line will also emit a low level of noise similar to the transmission line. The noise from the switchyard will generally be inaudible at the switchyard property line. The noise from the switchyard will not be audible at the nearest residence, which is more than 2,000 feet from the switchyard.

SHASTA COUNTY MITIGATION RECOMMENDATIONS

Mitigation in the form of equipment enclosure will be employed to reduce property line noise exposure to levels that meet Shasta County's "conditionally acceptable" property line CNEL of 75 dBA. Compliance with County guidelines would automatically eliminate impacts at the closest residential receptor. The proposed mitigation design, in the form of required minimum structural attenuation, is given in (**NOISE:** Table 7). It is noted that a 10-dB margin has been added to the required attenuation for the turbine, generator, and cooling tower fans to compensate for the nighttime CNEL penalty.

The proposed attenuation levels should be incorporated into the engineering design once final plans are completed. Upon implementation, no significant or residual noise impacts would remain.

NOISE: Table 7
Expected Resultant Operational
Noise Levels (Mitigated) (dBA)

				Resultant Noise Levels (dBA)		
Equipment	Source Level @ 50 feet	Number Used	Design Attenuation	Nearest Property Line (East)	Nearest Property Line (West)	Nearest Residence
Gas Turbine	85	2	20	57.9	51.9	41.3
AC Generator	85	3	20	66.5	49.1	41.3
Cooling Tower Fans	71	8	8	64.5	60.9	45.3
HRSG	82	2	10	71.0	55.0	48.3
Steam Turbine	80	1	20	49.9	43.9	33.2
Transformer Package	72	3	5	58.9	59.7	45.0
Boiler Pump	74	2	5	61.9	53.1	45.3
Circulation Pumps	72	8	5	64.9	63.2	49.3
Return Pump	72	2	5	58.9	57.2	43.3
Switch Yard Gear	65	3	5	51.9	52.7	38.0
SUM CNEL (Σ)				**74.3**	**67.6**	**53.8**

(Source: TMP 1999a, AFC § 6.4.3 and Table 6.4-9). Based upon planned operational equipment

Based upon the findings presented in (**NOISE:** Table 7), the mitigated noise levels will not exceed the 55 dBA Daytime noise levels and will exceed by 3.8 dBA of Nighttime noise guidelines in the Shasta County General Plan. Based upon analysis presented in (NOISE: Table 7) additional mitigation measures will be required in order for the powerplant operational noise levels to be at or below 50 dBA Nighttime noise levels as provided in Noise Element of the Shasta County General Plan.

CAL-OSHA MITIGATION RECOMMENDATIONS

Typically, individual power plant equipment can be provided that does not exceed a mitigated sound pressure level of 85 dBA at 3 feet from the equipment face and 5 feet above the ground. However, noise levels in some areas within a power plant typically exceed 85 dBA due to the additive effect of all nearby equipment as well as

the effect of sound reflection and reverberation. Special noise control measures, such as silencers, acoustical enclosures, or insulation and acoustical lagging, may be considered to reduce in-plant noise levels.

These noise controls, however, are not always practical for reasons such as maintenance access, heat buildup, space limitations, and safety. Therefore, noise levels in some areas may exceed a sound pressure level of 85 dBA. OSHA and Cal-OSHA noise exposure limits would be satisfied using hearing protection within areas exceeding this level. Staff has proposed measures (see proposed Condition of Certification **NOISE-5**, below) to ensure compliance.

CUMULATIVE IMPACTS

The cumulative impacts discussion for the TMPP is based on CEQA and the CEQA Guidelines which require that the discussion of cumulative impacts be "guided by the standards of practicality and reasonableness" (Public Resources Code (PRC) §21083(b)); and that "the discussion include a list of past, present, and reasonably anticipated future projects producing related or cumulative impacts" (California Code of Regulations (CCR) §15130(b)(1)(A)). The CEQA Guidelines require that cumulative impacts are discussed when they are significant, and that the discussions of cumulative impacts reflect the severity of the impacts and their likelihood of occurrence. However, the Guidelines state that the cumulative impacts discussion need not be provided in as great detail as is provided for the proposed project.

Therefore, the purpose of this analysis is to:

1. Identify past, present, and reasonably foreseeable actions in the project area that could affect noise at the TMPP.
2. Determine if the impacts of the TMPP and the other actions would overlap in time or geographic extent.
3. Determine if the impacts of the proposed project would interact with, or intensify, the impacts of the other actions.
4. Identify any potentially significant cumulative impacts.

There are no projects within the TMPP Area of Influence. For this discussion of cumulative impacts, the general geographic area of influence is defined as an approximate 2-mile radius around the power plant, or within 1 mile of the linear facilities.

Projects identified for consideration in this discussion of cumulative impacts include those: 1) where an application has been submitted to local jurisdictions for required approvals and permits; and/or 2) that has been previously approved and may be implemented in the near future.

FACILITY CLOSURE

Upon closure of the facility, all operational noise will cease; no further adverse impacts from operation will be possible. The remaining potential noise source will be that caused by dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise will be similar to that caused by the original construction of the project, it can be treated similarly. That is, noisy work can be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise laws, ordinances, regulations and standards then in existence would apply; applicable Conditions of Certification included in the Energy Commission Decision would also apply unless properly modified.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that the TMPP will likely be built and operated to comply with all applicable noise laws, ordinances, regulations and standards. Staff further concludes that the TMPP will likely present no significant adverse noise impacts. The TMPP will likely represent an unobtrusive, nearly undetectable addition to existing noise levels.

RECOMMENDATIONS

Staff recommends the conditions of certification proposed below be included in the Commission Decision.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 At least 15 days prior to the start of construction (defined as start of rough grading) of the TMPP and again at least 15 days prior to the commencement of steam blow activity, the project owner shall notify all residents within a 2-mile radius of the project site, by mail or other effective means. 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 TMPP. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall also be posted at the TMPP site during construction in a manner visible to passersby. This telephone number shall be maintained until the TMPP has been operational for at least one year.

Verification: The project owner shall transmit to the Compliance Project Manager (CPM) in the first monthly construction report following the start of rough grading, a statement signed by the project manager attesting that the above notification has been performed, describing the method of that notification, and including a sample letter, poster or other notice, as appropriate. This statement

shall also attest that the telephone number has been established and posted at the power plant site.

NOISE-2 Throughout the construction and operation of the TMPP, the project owner shall document, investigate, evaluate, and attempt to resolve all project related noise complaints.

Protocol: The project owner shall:

1. use the Noise Complaint Resolution Form (see below for an example), or functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
2. attempt to contact the person(s) making the noise complaint within 24 hours;
3. conduct an investigation to determine the source of noise related to the complaint;
4. take all feasible measures to reduce the noise at its source if the noise is project related, and
5. submit a report documenting the complaint and the actions taken. The report shall include a complaint summary and the results of noise reduction efforts; and if obtainable, a signed statement by the complainant, stating that the noise problem is resolved to complainant's satisfaction.

Verification: Within 30 days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with Shasta County and with the CPM documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 30-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is finally implemented.

NOISE-3 Prior to the start of construction of TMPP, the project owner shall submit to the CPM for review a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA standards.

Verification: At least 30 days prior to the start of rough grading the project owner shall submit to the CPM the above referenced program. The project owner shall make the program available to OSHA upon request.

NOISE-4 Upon the TMPP first achieving an output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey, utilizing the same monitoring sites employed in the pre-project ambient noise survey as a minimum. The survey shall also include the octave band pressure levels to ensure that no new pure-tone noise components have been introduced. No single piece of equipment shall be allowed to stand out as a dominant source of noise that draws complaints. Steam relief valves

shall be adequately muffled to preclude noise that draws complaints. The noise contributed by the TMPP operation at 100 feet from the nearest residence shall not exceed 50 dBA L_{eq} (night) under normal operating conditions including startups and shutdowns. If the results from the survey indicate that power plant noise levels are in excess of 50 dBA L_{eq} (night) at 100 feet from the nearest residence, additional mitigation measures shall be implemented to reduce noise to a level of compliance with this limit. The mitigation measures (to be employed as required) may include (but not be limited to):

1. Provide standard outdoor/weather enclosures for the combustion turbine generator packages.
2. Provide air inlet silencers for the combustion turbines.

Protocol: The measurement of power plant noise for purposes of demonstrating compliance with this Condition may alternatively be made at an acceptable location closer to the plant (e.g. 400 to 1,000 feet from the plant boundary) and this measured level then mathematically extrapolated to determine the plant noise contribution at the nearest sensitive receptor. However, notwithstanding the use of this alternative method for determining the noise level, the character of plant noise shall be evaluated at the nearest sensitive receptor to determine the presence of pure tones or other dominant sources of plant noise.

Verification: Within 30 days after completing the survey, the project owner shall submit a summary report of the survey to Shasta County and the CPM. Included in the report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. Within 30 days of completion of installation of these measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described above and showing compliance with this condition.

NOISE-5 The project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted within thirty (30) days after the facility is operating at an output of 80% of rated capacity or greater, and shall be conducted by a qualified person in accordance with the provisions of Title 8, California Codec of Regulations sections 5095-5100 (Article 105) and Title 29, Code of Federal Regulations, Part 1910. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable state and federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA upon request.

NOISE-6 Construction and construction related activity (that which causes off-site annoyance, as evidenced by the filing of a legitimate noise complaint) shall be restricted to the hours of: 7 a.m. to 7 p.m. on weekdays and from 8 a.m. to 6 p.m. on weekends and holidays.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement certifying that the above restrictions will be observed throughout the construction of the project.

NOISE COMPLAINT RESOLUTION FORM

Three Mountain Power Project
(99-AFC-2)

NOISE COMPLAINT LOG NUMBER _____

Complainant's name and address:

Phone number: _____

Date complaint received: _____
Time complaint received: _____

Nature of noise complaint:

Definition of problem after investigation by plant personnel:

Date complainant first contacted: _____

Initial noise levels at 3 feet from noise source _____ dBA Date: _____

Initial noise levels at complainant's property: _____ dBA Date: _____

Final noise levels at 3 feet from noise source: _____ dBA Date: _____

Final noise levels at complainant's property: _____ dBA Date: _____

Description of corrective measures taken:

Complainant's signature: _____ Date: _____

Approximate installed cost of corrective measures: $ _____
Date installation completed: _____
Date first letter sent to complainant: _____ (copy attached)
Date final letter sent to complainant: _____ (copy attached)

This information is certified to be correct:

Plant Manager's Signature: _____

(Attach additional pages and supporting documentation, as required).

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NOISE: APPENDIX A
FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

Noise levels can be measured in a number of ways. One common measurement, the equivalent sound level (L_{eq}), is the long-term A-weighted sound level that is equal to the level of a steady-state condition having the same energy as the time-varying noise, for a given situation and time period. (See NOISE: Table A1, below.) A day-night (L_{dn}) sound level measurement is similar to L_{eq}, but has a 10 dB weighting added to the night portion of the noise because noise during night time hours is considered more annoying than the same noise during the day.

NOISE Table A1
Definition of Some Technical Terms Related to Noise

Terms	Definitions
Decibel, Db	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, Db	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
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 5 decibels to levels in the evening from 7 p.m. to 10 p.m. and after addition of 10 decibels to sound levels in the night between 10 p.m. and 7 a.m.
Day-Night Level, L_{dn}	The Average A-Weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10 p.m. and 7 a.m.
Ambient Noise Level	The composite of noise from all sources, near and far. The normal or existing level of environmental noise at a given location.
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Source: California Department of Health Services 1976.	

In order to help the reader understand the concept of noise in decibels (dBA), NOISE: Table A2 has been provided to illustrate common noises and their associated dBA levels.

NOISE Table A2 Typical Environmental and Industry Sound Levels			
Source and Given Distance from that Source	A-Weighted Sound Level in Decibels (dBA)	Environmental Noise	Subjectivity/ Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		
Very Loud Music	110	Rock Music Concert	Very Loud
Pile Driver (50')	100		Very Loud
Ambulance Siren (100')	90	Boiler Room	Very Loud
Freight Cars (50')	85		
Pneumatic Drill (50')	80	Printing Press Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center Department Store/Office	
Light Traffic (100')	50	Private Business Office	Quiet
Large Transformer (200')	40		
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing
Source: Peterson and Gross 1974			

SUBJECTIVE RESPONSE TO NOISE

The adverse effects of noise on people can be classified into three general categories:

Subjective effects of annoyance, nuisance, dissatisfaction.
Interference with activities such as speech, sleep, and learning.
Physiological effects such as anxiety or hearing loss.

The sound levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise effects in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction, primarily because of the wide variation in individual tolerance of noise.

One way to determine a person's subjective reaction to a new noise is to compare the level of the existing (background) noise, to which one has become accustomed, with the level of the new noise. In general, the more the level or the tonal variations of a new noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

With regard to increases in A-weighted noise levels, knowledge of the following relationships (Kryter 1970) can be helpful in understanding the significance of human exposure to noise.

1. Except under special conditions, a change in sound level of one dB cannot be perceived.
2. Outside of the laboratory, a 3-dB change is considered a barely noticeable difference.
3. A change in level of at least five dB is required before any noticeable change in community response would be expected.
4. A 10-dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response.

COMBINATION OF SOUND LEVELS

People perceive both the level and frequency of sound in a non-linear way. A doubling of sound energy (for instance, from two identical automobiles passing simultaneously) creates a three dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus three dB). The rules for decibel addition used in community noise prediction are:

NOISE Table A3
Addition of Decibel Values

When two decibel values differ by:	Add the following amount to the larger value
0 to 1 dB	3 dB
2 to 3 dB	2 dB
4 to 9 dB	1 dB
10 dB or more	0
Figures in this table are accurate to ± 1 dB.	

Source: Thumann, Table 2.3

OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time to which the worker is exposed:

NOISE Table A4
OSHA Worker Noise Exposure Standards

Duration of Noise (Hrs/day)	A-Weighted Noise Level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.5	110
0.25	115

Source: OSHA Regulation

RELATIONSHIPS

$L_{dn} = 10 \log (1/24)[15x10^{(Ld/10)} + 9x10^{(Ln+10)/10}]$

<u>Note:</u> the 10-dB weighting added to the nighttime noise level. Daytime and nighttime are 15 hours (0700~2200 hrs) and 9 hours (2200~0700 hrs) respectively. L_d and L_n are the L_{eq} values over the 15 and 9 hours respectively. L_{dn} does not contain any consideration for tonal sounds, since it is derived from L_{eq} measurements.

CNEL is essentially the same as L_{dn}, except that different time segments are used in computation. The 24-hour period is divided into three segments instead of two. The day period (0700~1900 hours), evening (1900~2200 hours) and night (2200~0700 hours). The evening period is assigned 5-dB weighting and the nighttime is assigned 10-dB weighting. The extra 5 dB weighting during the evening results in higher values for CNEL that L_{dn}, but the difference is not statistically significant.

NOISE ATTENUATION

$[L_p]$ (at x = r) = $[L_p]$(at r = y) – 20log(x/y).

Where: x = distance to point where noise level is to be determined.
y = reference point.

$\Delta_{Loss} = 20\log (x/y)$.

Special case where x = 2y
$\Delta_{Loss} = 20\log (2y/y) = 20\log (2) = 6$

∴ As we double the distance, from a point source in free space, the noise level decreases by 6 dB.

VISUAL RESOURCES

Testimony of David Flores

SUMMARY

Energy Commission staff analyzed both the potential visual impacts of the proposed Three Mountain Power Project (TMPP) and the compliance of the project with applicable laws, ordinances, regulations, and standards. Staff concludes that the project may cause significant adverse visual impacts in the area of Key Observation Point 3 that has a view of the power plant. This significant visual impact will be mitigated to less than significant levels by implementation of mitigation measures (light reflectors and color treatment at power plant) requirements identified in this analysis. Also, the project after mitigation would not conflict with local policies regarding visual resources that are part of the applicable laws, ordinances, regulations, and standards. **VISUAL RESOURCES Table 2** provides an overall summary of staff's conclusion based on consideration of each Key Observation Point analyzed and the resultant values for visual impacts.

INTRODUCTION

PURPOSE

Visual resources are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether the TMPP would cause significant adverse visual impacts and whether the project would be in conformance with applicable laws, ordinances, regulations, and standards. The determination of the potential for significant impacts to visual resources resulting from the proposed project is required by the California Environmental Quality Act (CEQA) Public Resources Code section 21000 et seq. and Title 20, California Code of Regulations, section 1701 et seq.1. The determination of the conformance of the proposed project with applicable laws, ordinances, regulations, and standards is required by Public Resources Code section 25525.

ORGANIZATION OF ANALYSIS

This analysis is organized as follows:

- staff's analysis methodology;
- applicable laws, ordinances, regulations and standards;
- the visual setting of the proposed power plant site, including linear facility routes;
- the visual impacts of the proposed project on the existing setting;
- compliance of the project with applicable laws, ordinances, regulations, and standards; and

1 The California Energy Commission's power plant siting regulations.

- measures needed to mitigate any potential significant adverse visual impacts of the proposed project and to achieve compliance with applicable laws, ordinances, regulations, and standards.

METHODOLOGY

The methodology used in this visual assessment is described below and includes a description of the approach and process used, identification of the criteria used for visual assessment, and identification of the basis for identifying relevant significance criteria used in evaluating the impacts of the proposed project.

SIGNIFICANCE CRITERIA

Energy Commission staff considered the following criteria in determining whether a visual impact would be significant.

STATE

The CEQA Guidelines define a "significant effect" on the environment to mean a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including . . . objects of historic or aesthetic significance. (Cal. Code Regs., tit.14, § 15382.)

Appendix G of the Guidelines, under Aesthetics, includes four questions to be addressed regarding whether the potential impacts of a project are significant. These questions ask whether the project would:

a) have a substantial adverse effect on a scenic vista;
b) substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
c) substantially degrade the existing visual character or quality of the site and its surroundings; and/or
d) create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

LOCAL

Energy Commission staff considers all local goals, policies or designations regarding visual resources. Conflicts with such laws, ordinances, regulations, and standards can constitute significant visual impacts. See the section on Applicable Laws, Ordinances, Regulations, and Standards.

PROFESSIONAL STANDARDS

Professionals in visual impact analysis have developed a number of questions as a means of evaluating the potential significance of visual impacts (see, e.g., Smardon 1986). The questions listed below address issues commonly raised in visual analyses for energy facilities:

- Will the project substantially alter the existing viewshed, including any changes in natural terrain?

- Will the project deviate substantially from the form, line, color, and texture of existing elements of the viewshed that contribute to visual quality?
- Will the project eliminate or block views of valuable visual resources?
- Will the project result in significant amounts of backscatter light into the nighttime sky?
- Will the project be in conflict with directly-identified public preferences regarding visual resources?
- Will the project result in a significant reduction of sunlight, or the introduction of shadows, in areas used extensively by the community?
- Will the project result in a substantial visible exhaust plume?

KEY OBSERVATION POINTS

Energy Commission staff selected Key Observation Points (KOPs)5, to provide the basis for evaluation of project impacts by comparing the appearance before and after project construction. KOPs include locations that are chosen to be representative of the most critical locations from which the project would be seen.

EVALUATION PROCESS

For each KOP, Energy Commission staff considered the existing visual setting and the visual changes that the project would cause to determine impact significance. The applicant used Viewing Positions in the visual resources section of the application (TMPP 1999a). Energy Commission staff evaluated the appropriateness of these locations for the analysis and agreed with the selection of locations.

ELEMENTS OF THE VISUAL SETTING

To assess the existing visual setting, staff considered the following four elements:

Visual Quality - The value of visual resources. This analysis used an approach that considers visual quality as ranging from outstanding to low. Outstanding visual quality is a rating reserved for landscapes that would be what a viewer might think of as "picture postcard" landscapes. Low visual quality describes landscapes that are often dominated by "visually discordant human alterations, and do not provide views that people would find inviting or interesting" (Buhyoff et al., 1994). For projects in an rural setting such as the proposed project, visual quality typically ranges from high, such as for a park or major water view, to low, such as for an area of heavy industry.

Visual Sensitivity - A measurement of the level of interest or concern of viewers regarding the visual resources in an area. Official statements of public values and goals reflect viewers' expectations regarding a visual setting. This analysis also employed land use as an indicator of viewer sensitivity. Uses associated with 1) designated parks, monuments, and wilderness areas, 2) scenic highways and corridors, 3) recreational areas, and 4) residential areas are highly sensitive. Commercial uses, including business parks, are generally moderately sensitive,

with landscaping, building height limitations, and prohibition of aboveground utility lines demonstrating concern for visual quality. Large-scale industrial uses are typically the least sensitive because workers are focused on their work, and generally are working in surroundings with relatively low visual value.

Visibility - Visibility can differ substantially between view locations, depending on screening and the angle of view. The smaller the degree of screening, the higher a feature's visibility is. The closer the feature is to the center of the view area, the greater its visibility.

Viewer Exposure - The degree to which viewers are exposed to a view is affected by distance, the number of viewers, and the duration of view. Viewer exposure can range from having high values for all three factors, such as a foreground view from a large number of residences, to having low values for all three factors, such as a brief background view for a few travelers.

TYPES OF VISUAL CHANGE

To assess the visual changes that the project would cause, staff considered the following factors:

Dominance - One measure of change is *scale dominance* - the apparent size of an object relative to the visible expanse of the landscape and to the total field of view. Another measure of change is *spatial dominance* - the measure of the dominance of an object due to its location in the landscape. Dominance can range from subordinate to dominant.

Contrast – Visual contrast was evaluated in regard to the elements of color, form, line, and scale.[2] The degree of contrast can range from high to low.

View Blockage – View blockage is the blockage from view or elimination by the project of any previously visible components. Blockage of higher quality visual elements by lower quality elements causes adverse impacts. The degree of view blockage can range from strong to none.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL AND STATE

The proposed project, including the linear facilities, is located on private lands and is thus not subject to federal land management requirements. Likewise, no roadway in the project vicinity is a designated or eligible State Scenic Highway. Therefore, no federal or state regulations pertaining to scenic resources are applicable to the project

[2] Scale contrast is the scale of an object relative to other distinct objects or areas in the landscape.

LOCAL

SHASTA COUNTY

GENERAL PLAN

Shasta County has specific policies on visual or aesthetic resources that apply to TMPP. These issues are addressed in the Shasta County General Plan, Scenic Roadway Element, and Design Review Element and are implemented by the Shasta County Department of Resource Management (Shasta County, 1995). The Scenic Roadway Element of the General Plan provides criteria for establishing State Route 299 as an official scenic highway.

The Scenic Roadway Element of the General Plan provides criteria to protect the value of the natural and scenic character of the county's highways. The following guidelines have been developed to protect scenic corridors (State Route 299):

- Setback requirements
- Regulations of building form, material, and color;
- Landscaping with native vegetation, where possible;
- Minimizing grading and cut and fill activities;
- Requiring use of adequate erosion and sediment control programs;
- Siting of new structures to minimize visual impacts form highways;
- Regulation of the type, size, and location of advertising signs;
- Utility lines shall be underground wherever possible; where undergrounding is not practical, lines shall be sited in a manner which minimizes their visual intrusion.

The Design Review Element identifies the following means to achieving and enhancing the natural Environment:

- Use of appropriate building color;
- Fencing and screening;
- Maintenance of viewsheds, and;
- Use of natural vegetation and terrain.

Staff has addressed these requirements under the Condition of Certification section of this analysis. TMPP is generally consistent with the land use designation for the area, and therefore is considered consistent with associated visual resource planning purposes and General Plan requirements.

PROJECT DESCRIPTION

The proposed TMPP will be a nominal 500-megawatt (MW), natural gas-fired combined cycle power plant located near Burney in Shasta County. The site occupies a portion of a 40-acre, triangular shaped parcel situated on the northwest side of State Route 299, approximately one-mile northeast of the town of Burney. A private access road, approximately 1,500 feet in length, provides access to the site from State Route 299. The northeast portion of the property is occupied by an existing biomass-fueled power plant. This facility consists of several structures, including a boiler with a 125-foot exhaust stack, a three-story operation/administrative building, a maintenance shop, cooling towers, and a substation. Other components of the existing facility include exterior lighting mounted on steel poles, water storage ponds, a wood chip storage pile, and a paved laydown area.

WATER SUPPLY LINE

A 24-inch water supply pipeline will be installed from the plant site to the Burney Water District distribution facility. The water pipeline will be installed below ground therefore, for visual resources assessment purposes, the visual impacts for the pipeline corridor routes are not considered significant.

NATURAL GAS PIPELINE

A new 12-inch gas pipeline will be required, as locally produced natural gas is not available on site. The facility intertie to the existing pipeline will be 2,900 feet in length. The project's gas supply line will be installed below ground therefor, for visual resources assessment purposes, the visual impact for the gas pipeline is not considered significant.

WASTEWATER PIPELINE

The applicant is currently proposing to dispose of waste water blowdown in percolation ponds to be located west of the project site, across the railroad tracks (see **PROJECT DESCRIPTION** Figure 2). A short wastewater pipeline will be constructed to content to the percolation ponds. For visual resources assessment purposes, the visual impact for the wastewater pipeline is not considered significant.

TRANSMISSION LINE

The proposed transmission line from the site follows the northern property line west approximately 800 feet to the existing railroad right of way and then goes 1,800 feet north to the existing 230 kV PG&E lines located north of the project. Dense conifer pines on both sides will line the transmission route. An existing 60 kV transmission line is located on the east side of the right-of-way, and the wood poles are approximately 65 feet in height. No public roads cross the proposed transmission line route and public access to the route is limited to the property owners that border the power plant property. Because the railroad is used sporadically, the visual impact for the transmission line is not considered significant.

SETTING

REGIONAL SETTING

The project site lies about 50 miles northeast of Redding in the Burney Valley. The landscape includes Burney Mountain and views of peaks such as Mt. Shasta and Mt. Lassen that reach over 7,000 feet in elevation.

The Burney Valley extends over three miles in length and the valley is enclosed on the west by a series of bluffs and mountain peaks. Lookout Mountain is the closest of the peaks to the project site, with an elevation of 4,520 feet. Burney Mountain lies approximately 5 miles south of the project site at an elevation of 7,863 feet. The community of Burney is situated at about 3,173 feet above sea level. Dense stands of mixed conifer trees are seen on the mountain slopes with the National Forest Service timberland surrounding much of the valley.

Communities in the project area include the unincorporated town of Burney with approximately 3,500 residents and Johnson Park, a community of approximately 500 residents, located approximately one half-mile northeast of the proposed power plant. In addition, small rural communities such as the several dozen homes on Vedder Road and Black Ranch Road are located approximately one mile northwest of the power plant site.

A scenic vista is located on State Route 299, approximately four miles southeast of Burney. From this vista point, panoramic views of Burney Valley can be seen to the east from an elevation of about 4,000 feet. Views of the valley are partially framed by conifer trees in the foreground and by the ridgelines and mountains in the distance.

PROJECT AREA SETTING

The project site will be located on a triangular 40-acre parcel surrounded by dense conifer trees. In addition to the proposed power plant facility, the property also includes a biomass power plant, a loading facility, a maintenance facility, a 125-foot exhaust stack, cooling towers and a three-story administration building. The proposed plant site is set back about 500 feet from State Route 299. The plant will be developed in an area that was occupied by wood chips for the biomass plant. The only vegetation in the area of the project site consists of low-growing annual grasses.

KEY OBSERVATION POINTS

As provided in the AFC (AFC pg. 6.6-22, Section 6.6.1.5), the consultant structured the analysis of the project effects by identifying the view areas most sensitive to the project's potential visual impacts, and in consultation with CEC staff, three Key Observation Points (KOPs) were selected for the development of photo simulations that could be used as a basis for visualizing the plant's potential effects. This analysis focuses on viewers who are highly sensitive to changes in the visual setting and on existing visual features that affect the visual quality, visibility, and visual exposure to the proposed project for those viewers. **VISUAL RESOURCES**

Figure 1 shows the location of the KOPs used in this analysis and the direction of each view.

Because the natural gas pipeline, water supply and wastewater lines will be underground and will be either not visible or not highly visible, KOPs were not identified or defined for these features. For the same reason, the alternative pipeline corridor routes are not considered part of the potentially affected environment.

VISUAL RESOURCES Table 2 shows the value for visual quality, viewer sensitivity, visibility, and viewer exposure considered for each of the KOP's analyzed in this section and the resultant values for visual impacts. Table 2 also provides an overall summary of staff's analysis for this section:

KEY OBSERVATION POINT 1 – POWER PLANT

KOP 1 (see **VISUAL RESOURCES Figure 1** for location) represents the view toward the site from the access road (Energy Drive) into the project site. Although the public will not see this view, the KOP was selected because it provides an unobstructed foreground view of the proposed power plant as it will appear at the site.

Visibility

Approximately 5,700 vehicles per day travel on State Route 299. From a visibility standpoint, with the dense cover of conifer trees and the distance of TMPP plant from the state highway, the project will not be visible to the traveling public, and visibility will be low.

Visual Quality

The view of KOP 1 has the character of a landscape typical of a biomass power plant. Cooling towers, conveyor belts, boiler plant with a 125-foot stack, administration and maintenance buildings, and heavy equipment are elements of the landscape scene. Because existing industry characterizes this view and no features of higher quality are present, visual quality in this view is low.

Viewer Exposure

Approximately 5,700 vehicles per day travel on State Route 299. Due to the dense cover of conifer trees along the highway, the traveling public will not see the proposed power plant. Considering the small number of viewers (workers and occasional visitors) to the site, the viewer exposure is low.

KEY OBSERVATION POINT 2 - RAILROAD CORRIDOR

KOP 2 (see **VISUAL RESOURCES Figure 2** for location) represents the view of the new transmission lines on the west side of the existing railroad tracks. The AFC (pg. 6.6-24) discussed the Shasta Sunset Dinner Train that runs along this corridor at various times of the year. In a personal telephone discussion with a representative of the Mc Cloud Railway on November 3, 1999, staff was informed that the dinner train does not extend to this area, and the last train activity in this

VISUAL RESOURCES Figure 1
Key Observation Points

area was approximately five years ago for agricultural deliveries. There are no sensitive receptors with the sporadic nature of the rail line in this area; therefore no further analyzes for KOP 2 is warranted.

VISUAL RESOURCES Table 2
Summary of Visual Impact Susceptibility - Key Observation Points

	VISUAL QUALITY	VIEWER SENSITIVITY	VISIBILITY	VIEWER EXPOSURE
Key Observation Point 1	Low	Low	Low	Low
Key Observation Point 2	No sensitive receptors	No sensitive receptors	No sensitive receptors	No sensitive receptors
Key Observation Point 3	Low to moderate	Moderate	Low to moderate	Low to moderate

KEY OBSERVATION POINT 3- VEDDER ROAD RESIDENTIAL AREA

KOP 3 (see **VISUAL RESOURCES Figure 3** for location) represents a residential area approximately one mile northwest of the project site. Several dozen homes are within this rural residential area, with most homes situated within the forested areas. Approximated six homes lie at the edge of the trees along the open pasture area. Views of this area encompass open meadow in the foreground against a backdrop of forest in the middleground and mountains in the background. The existing biomass power plant and the proposed TMPP lie beyond the stand of conifer trees at the edge of the meadow.

Visibility

The existing conifer trees located along the eastern edge of the pasture will obscure the proposed power plant. However, from this visual point, the upper portion of the two stacks as well as the upper part of the turbine building roof would be visible above the trees. The new stacks would be somewhat taller than the existing stack that can also be seen from Vedder Road. Visibility is considered low to moderate.

Visual Quality

The view from KOP 3 is toward the east that takes in a panoramic view of the pasture and agricultural area, the stand of densely populated conifer trees and mountains in the background. Considering these elements, visual quality is low to moderate.

Visual Exposure

The proposed power plant is in the middle ground from this KOP. The number of viewers is low, and the view duration is long. Therefore, viewer exposure is low to moderate.

IMPACTS

CONSTRUCTION IMPACTS

PROJECT SITE

The period of construction for the main site and offsite utility installation is expected to take about 20 months and would entail heavy construction equipment, laydown and storage area, and truck traffic. The power plant site is sufficiently far from residences that visual impacts due to construction would not be significant.

ELECTRICAL TRANSMISSION LINES

Construction activities for the transmission lines would involve drilling holes for tower foundations, installation of the foundation reinforcement and structure anchoring equipment, the placement of concrete for foundations, the installation of the structures, and the two transition stations.

The new electrical transmission tie-in lines would connect the PG&E substation to be located on the west side of the railway right-of-way, with the existing 230 kV lines located approximately 1,800 feet north of the project site. The new power poles would be tubular steel, approximately 118 feet in height with four cross arms per pole. As indicated in staff's report, visual analysis is not considered significant in the area proposed for the linear facilities. No sensitive receptors are present in the area of the railroad right-of-way as the tracks are used sporadically based on need.

NATURAL GAS LINES, WATER SUPPLY AND WASTEWATER PIPELINES

As indicated earlier in the staff analysis, the project's natural gas, water supply, and wastewater pipelines will be installed below ground therefore, for visual resources assessment purposes, the visual impact for the referenced underground pipelines are not considered significant.

OPERATIONS IMPACTS

KEY OBSERVATION POINT 1

Visual Resources Figure 1b shows the view from KOP 1 with the proposed project simulated in the view. As shown, the plant will not be visible from State Route 299 and although the project will add a major element to the view, from the perspective of KOP 1, the only individuals to see the plant will be the workers and visitors to the project site. From the perspective of form, line, color, texture, scale dominance, and spatial dominance, because of its location, and general consistency with the existing biomass facility adjacent to the project site, the project will not appreciably change the character and quality of the landscape visible from the access road. It can be concluded that the proposed plant will not have a significant impact based on the following summarization of visual factors for KOP 1:

- viewer sensitivity is low;

- visual quality is low with views of the project site generally seen by onsite workers and visitors to the site;
- visibility is low;
- viewer exposure is low;
- the highest levels of contrast would be moderate;
- scale dominance would be negligible,
- spatial dominance would be co-dominant with the existing biomass facility adjacent to the proposed power plant facility; and
- view blockage would be negligible.

Considering all of these factors, the visual impact would be less than significant from the view area represented by KOP 1.

KEY OBSERVATION POINT 2

Visual Resources Figure 2B shows the view from KOP 2 of the proposed transmission line poles visible along the private railroad tracks. From this KOP, there are no sensitive receptors with the sporadic nature of the rail line in this area, therefore no further analysis for KOP 2 is warranted.

KEY OBSERVATION POINT 3

Visual Resources Figure 3B shows the view from KOP 3 as it represents the proposed project as seen from the Vedder Road residential area, which is located more than one mile away from the project site.

CONTRAST WITH STRUCTURES

From KOP 3, most of the proposed plant facility will be screened by the existing conifer trees located along the eastern edge of the pasture and separated by Black Ranch Road. However, the upper portion of the two stacks (140 feet high) and the upper part of the turbine building (104 feet high) would be visible above the trees. The proposed power plant will be in the middle ground and will appear slightly taller than the existing conifer trees. The form and line of the proposed stacks would be similar to the existing trees. The power plant stacks and building would be colored to match the color and texture with the existing scenery (i.e., trees, mountains). In summary, the proposed power plant would cause low to moderate contrast in form, line, color, texture, and scale.

Contrast with Vegetation

Vegetation visible in the view from KOP 3 consists of a variety of seasonal pasture grasses, agricultural land, and dense conifer trees. The vertical form of the power plant stacks would contrast low to the straight line form of the conifer trees in the foreground. The color tones of the power plant would contrast moderately with the texture of the trees. The towers would not be substantially larger than the existing conifer trees, so scale contrast with vegetation would be low.

Contrast with Land/Water

No water is visible in this view. The landforms consists of flat natural land with dense conifer trees in the middleground and mountains visible in the horizon. The proposed power plant would not contrast highly with this land surface in regard to form and line. The earth tone colors of the proposed power plant would cause low contrast with the natural terrain of the landforms of this viewpoint. The flat texture of the stacks would also cause low contrast with the texture of the land. The existing dense conifer trees in the middleground would compliment the power plant stacks and building, so scale contrast with landforms would be low.

Scale Dominance

The group of proposed power plant stacks visible from this viewpoint would be small in size compared to the panoramic field of view and would occupy a small part of the setting. Therefore, scale dominance from KOP 3 would be co-dominant.

Spatial Dominance

Because the spatial composition of the view from KOP 3 is panoramic, the power plant stacks and building would be subordinate in regard to composition. Spatial dominance would not be prominent in regard to position. Because the power plant stacks and building would be almost backdropped by sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

View Blockage

From KOP 3, the proposed power plant stacks and building would only block a small portion of the field of vision. Therefore, the amount of view blockage is minimal.

Visual Impact Severity

Because scale dominance would be co-dominant, the project's visual impact severity from KOP 3 would be low. (see VISUAL RESOURCES APPENDIX B-Table B-1).

LIGHTING

Although the proposed power plant is in an industrial area, existing lighting levels are generally low in the immediate vicinity. Exterior lighting for the proposed power plant therefore has the potential to considerably increase lighting levels, creating glare, backscatter to the nighttime sky, and illumination of visible plumes. The applicant has proposed measures to reduce such impacts, and Energy Commission staff has expanded on these measures in the proposed conditions of certification.

VISIBLE PLUMES

COOLING TOWER PLUME CHARACTERISTICS

The potential exists for white vapor plumes (water vapor condensation from the exhaust) to be visible from the project stacks and cooling tower. The frequency,

persistence, and size of visible condensate plumes depends primarily on the design and type of combustion turbine generator, heat recovery steam generator, auxiliary boiler, and cooling tower, as well as meteorological conditions of temperature and humidity.

The plume of steam rising from the cooling towers could project upward as much as 150 feet above the cooling towers under worst case conditions of temperature and atmospheric conditions.

Although condensate plumes usually tend to dissipate fairly quickly, because of the meteorological conditions in late November, December, and January, such a plume tends to linger and not dissipate as rapidly. However, this is also the foggy season and such plumes will not be visible much of the time. During the rest of the period when conditions are favorable for steam plume formation, the length of time under which plumes may occur is limited to short periods on any particular day.

Viewshed

The viewshed for the plume is substantially larger than that for the project structures because the plume's maximum height will be much greater than the height of the structures. The tallest proposed structures are the two stacks, proposed to be 140 feet tall. The predicted height of the plume above the cooling towers is approximately 130 feet and plume lengths of 106 feet to 1600 feet dependent upon meteorological conditions. McCulley, Frick & Gilman, Inc, an independent consultant for the applicant, prepared this plume analysis. The primary area of viewshed is the Vedder Road residential area, which is not a densely populated residential area.

Visual Quality

The cooling tower plume's viewshed includes the Burney Valley and the surrounding mountains. The natural landscape of the area is generally forestland consisting of conifer and hardwood trees, grassland, and agricultural croplands. Based on the landscape criteria, visual quality is moderate to high.

Viewer Sensitivity

The plume would generally not be visible from State Route 299. The occasional traveler will stop along the scenic pullout on State Highway 299, located approximately six miles southeast of Burney. Although the Burney Valley is known for its scenic value, because of the distance of the scenic pullout (approximately six miles from the plant site) the steam plume would be visible in the backdrop and silhouetted against the mountains. Based on this criterion, viewer sensitivity would be low to moderate. From the residences in the Vedder Road area, based on the plume analysis prepared by McCulley, Frick & Gilman, the plume height and length would be less than 130 feet above the stacks. With this relatively small scale, and the presence of the plume, which emanates from the existing biomass power plant, the new plume would appear as an incremental change that would generally be consistent with the character currently experienced by the residences along Vedder Road. Viewer sensitivity for the residence would be low to moderate.

Visibility

For the six residences along Vedder Road with direct views of the plant site the visibility of the plume is low to moderate because trees and the front view of the homes face away from the plant site. For the public traveling along State Highway 299, the view of the Burney Valley at the scenic pull-out (approximately six miles from project site) would be of relatively small scale and would appear as low clouds. Visibility would be low to moderate.

Viewer Exposure

The factors determining viewer exposure are distance, the number of viewers and the duration of exposure. The number of travelers stopping at the scenic pull-out is low. The duration of view is short due to the variable presence and size of the plume and due to the differences in activities between viewers. Although condensate plumes usually tend to dissipate fairly quickly, because of the meteorological conditions in late November, December, and January, such a plume tends to linger and not dissipate as rapidly. However, this is also the foggy season and such plumes will not be visible during much of the time. During the rest of the period when conditions are favorable for steam plume formation, the length of time under which plumes may occur is limited to short periods on any particular day. Considering these limitations, duration of view is low for the traveling public. Maximum duration of view for residents on Vedder Road is between one and two minutes because of short distance of travel from the top of the hill to the valley floor, and actual duration for these residents is further restricted by the weather conditions previously discussed. Therefore, expected duration of view for residents of Vedder Road is short. In summary, for the traveling public the viewing distance is background, the number of viewers is low, and the duration of view is very short, so overall visual exposure for travelers is low to moderate. For the residents of Vedder Road, the viewing distance is middleground, the number of viewers is low, and the duration of view is short, so overall visual exposure for residents is low.

Visual Impact Susceptibility

For travelers on State Route 299, visual quality is moderate to high, visual sensitivity is low to moderate, visibility is low to moderate, and viewer exposure is low. Considering these factors, for travelers on State Route 299, visual impact susceptibility is low.

For residents on Vedder Road, visual quality is moderate to high, visual sensitivity is low to moderate, visibility is low to moderate, and viewer exposure is low. Considering these factors, for residents on Vedder Road, visual impact susceptibility is low to moderate.

Contrast

Existing Structures

The visible cooling tower plume from the proposed project would cause strong contrast to the surrounding existing dense conifer forest. Color, line and texture contrast of the plume varies dependent on weather conditions in the area. Scale contrast would be high due to the visibility of the rural setting. An existing biomass plant is adjacent to the proposed plant with various structures associated with the operation. The highest structures currently on site consist of a 125-foot high exhaust stack and a 60-foot high cooling tower associated with the biomass plant. To the extent of their contrast with the plume, the massive size of the plume contributes highly to the already diminished quality of the views the area. In summary, during the limited times over the year that the cooling tower plume will occur, it would cause high contrast in regard to form, scale, line, color, and texture.

Vegetation

The visible cooling tower plume from the proposed project considered in relation to vegetation would cause moderate contrast in regard to the high vertical form of the conifer tree surrounding the project site. The plume would cause high contrast in regard to the line of the terrain. The white to light gray color of the plume would create high contrast with the green colors of the trees. The plume's soft, irregular texture would contrast moderately to the more distinct but regular texture of the forest trees. The plume would cause high contrast with the trees in regard to scale because it would appear taller than any vegetation when it is visible. In summary, in regard to vegetation, during the limited times over the year that the cooling tower plume would occur, the proposed project would cause moderate contrast in regard to form, line, color, and scale, and moderate contrast in regard to texture.

Land/sky

The cooling tower plume would cause high contrast in regard to the form of the land, which consists of valley views of forested land, some of which have various mountain peaks on the horizon. The plume of steam rising from the cooling towers will occur intermittently.

The plume would cause high contrast in regard to the generally straight line of the horizon and the irregular line of the various mountains. The plume would cause high contrast regarding color when the sky is clear and low contrast when the sky is cloudy. The plume would cause moderate contrast with the moderately varied texture of the land. The plume would cause high contrast with the scale of the land, appearing taller than any land feature. In summary, in regard to land/sky, during the limited times over the year that the cooling tower plume would occur, the proposed project would cause high contrast in regard to form, line, color, and scale, and moderate contrast in regard to texture.

Scale Dominance

The cooling tower plume from the proposed project, although it would occur only during limited times of the year, because of its height and width and middle ground distance, it would be a prominent element in the field of view, so the plume would create a co-dominant level of scale dominance.

Spatial Dominance

The cooling tower plume from the proposed project would vary in its location in the view depending on the viewpoint, so its spatial dominance would vary from subordinate to prominent in regard to composition. Because of its middle ground location, spatial dominance would be between prominent and subordinate in regard to position. Because the plume would be partially backdropped by sky, spatial dominance in regard to backdrop would be between prominent and subordinate. Overall, spatial dominance would be co-dominant.

View Blockage

For the traveling public and residents of Vedder Road in the viewshed of the plume, during the limited times over the year it would occur, the plume would block a low portion of the view of the various mountains. Therefore, the severity of view blockage would be low.

Visual Impact Severity

Because a) contrast of the cooling tower plume with existing structures would be high in regard to form, b) contrast with vegetation would be moderate in regard to form, line, and color, c) contrast with land/sky would be moderate in regard to form, line, and color, d) scale dominance would be co-dominant, and e) spatial dominance would be co- dominant, the cooling tower plume's visual impact severity would be moderate (see VISUAL RESOURCES Table B-1).

Visual Impact

For residents on Vedder Road, visual impact susceptibility is low to moderate and the visual impact severity of the cooling tower plume, during the limited times of the year that it would occur, would be strong, so visual impacts would be less than significant. This also takes into account the limited times per year that the plume would occur, the generally poor weather conditions expected when the plume would occur, and the limited affected residences in the area.

BURNEY RESOURCE GROUP COMMENTS

On January 10, 2000, staff received comments from the Burney Resource Group (BRG) of their assessment of the Preliminary Staff Assessment for Visual Resources. Staff will address the three areas in which they have indicated will cause a significant adverse visual impact.

The three areas of concern are: 1) adverse effect on a scenic vista, 2) degradation of the existing visual character or quality of the site and its surroundings, and 3) creation of a new source of substantial light or glare affecting day or nighttime views in the area. The general area of concern of the BRG is from KOP 3 which

represents the proposed project as seen from the Vedder Road residential area, which is located more than one mile away from the project site.

From the perspective of visual analysis, an adverse visual impact occurs with public view when: (1) an action perceptibly changes existing features of the physical environment so that they no longer appear to be characteristic of the subject locality or region; (2) an action introduces new features to the physical environment that are perceptibly uncharacteristic of the region and /or locale; or aesthetic features of the landscape become less visible (e.g., partially or totally blocked from view) or are removed.

As provided in staff's analysis, the proposed project is situated on a parcel of land zoned for industrial use, with an existing bio-mass generating plant adjacent to the subject property. The Burney Valley has two lumber mills, which are prominent features in the area. The mills are not screened from public view and are located adjacent to the highway. At both mills, steam plume from the stacks rise into the atmosphere creating a white or light coloration against the darker coloration and horizontal curvilinear lines of the surrounding Burney Mountains. From this base line staff concluded that although the viewshed from KOP 3 is panoramic of the valley floor and surrounding mountains, it has certain scenic limitations due to activity consistent with previously adopted zoning and general plan requirements.

The view of the physical plant structures will barely be discernable from KOP 3. As indicated in staff's analysis, the upper portions of the cooling tower stacks and turbine building roof would be visible above the trees. The applicant as well as staff has recommended mitigation measures (ie., painting requirements of the physical plant) that will ensure the plant's color consistency with surrounding landscape colors. In addition, the applicant and staff have recommended additional planting of trees and vegetative buffers to ensure screening of the project.

As provided in the Visible Plumes section of this report, frequency, persistence, and size of the visible condensate plume will be dependent on meteorological conditions of temperature and humidity. The Burney Resource Group indicated that the meteorological data used by McCulley, Frick & Gilman in the plume analysis may not be representative of the valley floor conditions. Energy Commission air quality staff believe that the meteorological data is acceptable for conducting a plume analysis. Energy Commission air quality staff is analyzing Mc Culley, Frick & Gilman's data and conclusions, and staff intends to provide additional information to the Committee in the hearing phase regarding the results of this analysis.

The lighting at the proposed plant will be totally revamped to ensure that glare and backscatter does not occur. In reviewing the project site with the applicant's representative, illuminated lights on wooden poles (approximately 90 feet in height) were viewed. These lights were utilized during evening hours to assist the site crew in removing wood chips for use at the biomass plant. The applicant's representative indicated their intent to remove of the lighted poles and install lighting that will be shielded and placed so as to minimize off-site light and glare. Staff has provided in this report mitigation that will ensure compliance.

In reviewing the BRG's comments, it is staff's belief the proposed plant does not change the physical environment or characteristics of this area. In addition, based on staff's analysis, approval of this project will not introduce new features to the physical environment, which are uncharacteristic of the region.

CUMULATIVE IMPACTS

The existing biomass power plant has not caused significant visual impacts. The biomass plant appears as an industrial facility in an otherwise rural area. Its size, color contrast, cooling tower plume, and lighting cause much of this impact. The proposed project would add incremental but not substantial visual impact to the area.

The proposed power plant would be larger than the existing biomass facility, so the incremental increase in impact caused by the proposed project would be substantial. The proposed project would increase the industrial character of the vicinity, although the property has been zoned heavy industrial by Shasta County. Therefore, the proposed project is consistent with the County's zoning requirements. In addition, the existing dense conifer trees surrounding the property reduce the visual impact of the existing biomass and proposed power plant on adjoining properties and roads.

Staff in reviewing the applicant's independent plume analysis determined that, under certain meteorological conditions, the cooling tower plume would be noticeably wider than the plume from the existing biomass power plant because the proposed project would be larger in size compared to the biomass plant. Therefore, the cooling tower plume from the proposed project would add substantially to the existing impact caused by the cooling tower plume from the biomass power plant. As provided in staff's plume analysis, although the plume will be substantially higher and wider under certain meteorological conditions, visibility of plumes from both plants are from distances and will occur during winter months when overall visibility is at its lowest.

Existing lighting from the biomass power plant is visible from Key Observation Points 1, 2, and 3. The lights are sufficiently numerous and widespread so as to indicate the large mass of the power plant facility, adding an incongruous industrial element to the otherwise rural character of the area. The lights create backscatter to the nighttime sky when viewed from residences in the Vedder Road residential area. Considering these factors, the lighting on the existing biomass facility causes a significant visual impact. Even if the lighting impacts for the proposed project are mitigated as recommended below, residual impacts due to the proposed project will occur, contributing to a significant cumulative visual impact. Methods recommended to reduce the cumulative lighting impacts are discussed below under mitigation.

FACILITY CLOSURE

INTRODUCTION

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

PLANNED CLOSURE

Planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence. The closure plan that the project owner is required to prepare should address removal of the power plant structures and the transmission poles to reduce visual impacts.

UNEXPECTED TEMPORARY CLOSURE

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency. No special conditions regarding visual resources are expected to be required to address temporary closure.

UNEXPECTED PERMANENT CLOSURE

Unexpected permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. The contingency plan that the project owner is required to prepare should address removal of the power plant structures and the transmission poles to reduce visual impacts.

COMPLIANCE WITH LORS

LOCAL

COUNTY OF SHASTA

Shasta County has submitted conditions of approval (October 6, 1999) for visual resources which include structure painting, onsite lighting, and visual buffer requirements. The applicant has proposed to prepare a Landscape Plan, structural painting and painting requirements and visual buffers and intends to conform to the requirements of Shasta County. Once available, the applicant will send a copy of the specified visual requirements to the Energy Commission for review. Staff recommends the adoption of a condition of certification to ensure that the Landscape, structural painting, onsite lighting, and visual buffers requirements and its implementation satisfy the requirements of the Shasta County Resource

Management Agency. Shasta County Planning Division and staff's analysis concluded that the height of proposed structures proposed for TMPP would not adversely effect surrounding land uses.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

SPECIFIC MITIGATION MEASURES

The Applicant has proposed eight mitigation measures "to make the project more aesthetically acceptable" (TMPP 1999, p. 6.6-46 & 47):

- Roof material of new buildings will be painted brown or dark green or another suitable color to blend with the color of the existing conifer tree screening, particularly as seen from the Vedder Road residential area.
- The proposed stacks will be painted medium to dark brown or another suitable color to blend with the existing landscape. The selection of the final paint color will be made in consultation with Energy Commission staff and County officials.
- To minimize potential glare, all proposed structures including new fences will be painted or finished with a non-reflective treatment.
- Additional tree plantings will be installed along the fence line to increase the level of visual screening of the Facility as seen from State Route 299. New plantings will incorporate conifer trees.
- The existing tree buffer area located along the west side of the site will be preserved and maintained and a buffer of trees will be planted on the west side of the PG&E substation in order to screen the facility as seen from the Vedder Road residential area.
- Exterior lighting will include the use of non-glare fixtures. Lighting fixtures will be located and designed to avoid casting light or glare on off-site locations.
- The new sign for the Three Mountain Power Facility will be designed using material and colors that blend in with the surrounding landscape. Lighting for the sign will utilize non-glare fixtures and will be designed to provide focused illumination.
- Substation and Transmission Line poles and equipment will be treated in a flat, non-reflective finish and color to blend with the surrounding landscape.

EFFECTIVENESS OF THE APPLICANT'S PROPOSED MITIGATION MEASURES

The Applicant's proposed mitigation measures will act to reduce the potential significance of visual impacts associated with the generation project and staff generally agrees with the applicant's proposed mitigation measures in regard to color and lighting for the power plant. However, staff's position is that these measures need to be more precisely developed in conditions of certification, which staff proposes below.

STAFF'S PROPOSED ADDITIONAL MITIGATION

STAFF MITIGATION 1 (CONDITION 1)

A specific painting plan is needed to ensure that proposed colors will not unduly contrast with the surrounding landscape colors. Such a plan should be submitted at an early time so that any precolored buildings, structures and linear facilities can have colors approved and included in bid specifications for such buildings or structures.

STAFF MITIGATION 2 (CONDITION 3)

A specific lighting plan is needed to ensure that project lighting will be adequately designed, shielded, and placed so as to minimize off-site light and glare. This plan should also minimize backscatter to the nighttime sky, and should include provisions to minimize lighting of plant areas, consistent with operational and safety needs. A procedure is also needed to resolve any lighting complaints.

STAFF MITIGATION 3 (CONDITION 4)

A specific landscaping plan should be prepared showing the location of such landscaping, the varieties and sizes of plants and trees (conifer) proposed to be used in such landscaping, and the proposed time to maturity for such landscaping.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

With application of the proposed mitigation, the visual impacts of the proposed power plant will be less than significant. The use of colors that blend with the existing setting will reduce the potential visual impact of the project structures to a less than significant level. Measures to minimize lighting effects will reduce such impacts to less than significant levels.

As discussed in staff's analysis of condensation plumes, meteorological conditions will determine the severity of the visibility during any given time. In addition, because of the project's rural setting, and lack of residences in the area, staff has determined that periodic and seasonal condensation plumes will have no significant impact.

Staff has reviewed the proposed transmission line route and determined that the linear facilities will not adversely effect views significantly. Staff has provided mitigation (Staff Mitigation 1) which ensures painting of the transmission poles to a color consistent with the surrounding area.

RECOMMENDATION

The Energy Commission should adopt the following conditions of certification if it approves the project.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 Prior to the start of commercial operation, the project owner shall treat the project structures, buildings, towers, substation and tanks visible to the public in a non-reflective color to blend with the surroundings. The project owner shall treat the cooling towers with a heat-resistant color that minimizes contrast and harmonizes with the surrounding environment.

Protocol: The project owner shall submit a treatment plan for the project to the California Energy Commission Compliance Project Manager (CPM) for review and approval. The treatment plan shall include:

- specification, and 11" x 17" color simulations, of the treatment proposed for use on project structures, including structures treated during manufacture;
- a detailed schedule for completion of the treatment; and,
- a procedure to ensure proper treatment maintenance for the life of the project.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall submit to the CPM a revised plan.

After approval of the plan by the CPM, the project owner shall implement the plan according to the schedule and shall ensure that the treatment is properly maintained for the life of the project.

For any structures that are treated during manufacture, the project owner shall not specify the treatment of such structures to the vendors until the project owner receives notification of approval of the treatment plan by the CPM.

The project owner shall not perform the final treatment on any structures until the project owner receives notification of approval of the treatment plan from the CPM.

The project owner shall notify the CPM within one week after all precolored structures have been erected and all structures to be treated in the field have been treated and the structures are ready for inspection.

Verification: Not later than 30 days prior to ordering the first structures that are color treated during manufacture, the project owner shall submit its proposed plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

Not less than thirty days prior to the start of commercial operation, the project owner shall notify the CPM that all structures treated during manufacture and all structures treated in the field are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-2 Any fencing for the project shall be non-reflective.

Protocol: Prior to ordering the fencing the project owner shall submit to the CPM for review and approval the specifications for the fencing documenting that such fencing will be non-reflective.

If the CPM notifies the project owner that revisions of the specifications are needed before the CPM will approve the submittal, the project owner shall submit to the CPM revised specifications.

The project owner shall not order the fencing until the project owner receives approval of the fencing submittal from the CPM.

The project owner shall notify the CPM within one week after the fencing has been installed and is ready for inspection.

Verification: At least 30 days prior to ordering the non-reflective fencing, the project owner shall submit the specifications to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the fencing that the fencing is ready for inspection.

VIS-3 Prior to the start of commercial operation, the project owner shall design and install all lighting such that light bulbs and reflectors are not visible from public viewing areas and illumination of the vicinity and the nighttime sky is minimized. To meet these requirements:

Protocol: The project owner shall develop and submit a lighting plan for the project to the CPM for review and approval. The lighting plan shall require that:

- Lighting is designed so that exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of this outdoor lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;

- High illumination areas not occupied on a continuous basis such as maintenance platforms or the main entrance are provided with switches or motion detectors to light the area only when occupied;
- A lighting complaint resolution form (following the general format of that in attachment 1) will be used by plant operations, to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file and a carbon copy submitted to the CPM.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

Lighting shall not be installed before the plan is approved. The project owner shall notify the CPM when the lighting has been installed and is ready for inspection.

Verification: At least 90 days before ordering the exterior lighting, the project owner shall provide the lighting plan to the CPM for review and approval. The CPM will notify the project owner of approval or disapproval within 15 days of receipt of the lighting plan.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days of completing exterior lighting installation that the lighting plan is ready for inspection.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the landscaping that the landscaping is ready for inspection.

VIS-4 Prior to the start of commercial operation, the project owner shall implement a landscape plan that meets the requirements of the Shasta County Planning requirements and provides a continuous screen of the proposed power plant.

a. The project owner shall submit to the CPM for review and approval a specific plan describing its landscaping proposal, stating that it conforms to Shasta County's Planning Department. The plan shall include, but not be limited to:
   - a detailed landscape plan, at a reasonable scale, which includes a list of proposed tree and shrub species and sizes and a discussion of the suitability of the plants for the site conditions and mitigation objectives.
   - maintenance procedures, including any needed irrigation;

- a procedure for replacing unsuccessful plantings; and
- a fifty-foot vegetative visual buffer area on-site and adjacent to the property boundaries, excluding the northern property boundary which is adjacent to land located in the Timber Production (TP) district. Trees common to the area shall be planted, as necessary and existing trees within the 50-foot area shall be maintained in living condition. Planted trees shall be a minimum of 15-inch box in size. The intent of the buffer is to create a screen of vegetation to reduce visual impact from adjoining properties and roads.

b. If the CPM notifies the project owner that plan revisions are needed, the project owner shall prepare and submit to the CPM a revised plan for CPM approval.

c. The trees and shrubs shall not be planted before the plan is approved. The project owner shall notify the CPM when the trees and shrubs have been planted and are ready for inspection.

Verification: At least 90 days prior to the start of commercial operation, the project owner shall submit the proposed landscape plan to the CPM for review and approval. The CPM will respond to the project owner within 15 days of receipt of the landscaping plan.

The project owner shall submit any required revisions within 15 days of notification by the CPM. The CPM will respond to the project owner within 15 days of receipt of the revised documents. The project owner shall notify the CPM in the next Monthly Compliance Report following completion of the proposed planting that the planting is ready for inspection.

VIS-5 The project owner shall comply with the requirements of the County of Shasta Conditions of Approval regarding screening of outdoor storage and refuse storage areas.

The project owner shall submit a plan for screening refuse and storage areas to the CPM for review and approval. The submittal shall include evidence from the County of Shasta that the plan conforms to the conditions of approval requirements submitted to commission staff on October 6, 1999.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, the project owner shall submit to the CPM a revised plan.

The project owner shall not implement the construction of the storage areas until the project owner receives approval of the submittal from the CPM.

The project owner shall notify the CPM within one week after the screening has been installed and is ready for inspection.

Verification: At least 30 days prior to installing the screening, the project owner shall submit the plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the screening that the screening is ready for inspection.

VIS-6 Prior to the start of commercial operation, the project owner shall design and submit to the CPM for review and approval a signage plan including specifications for the new signage identifying TMPP. The project owner shall not install the TMPP sign(s) until the signage plan has been approved by the CPM.

Protocol: The signage plan shall include the following design criteria which meets Shasta County Zoning requirements:

- Signage for purposes of site identification shall be limited to one monument sign;
- The monument sign shall not exceed six feet in height and not exceed 90 square feet in size. For a double faced monument sign, each face shall not exceed 45 square feet;
- The sign shall be setback a minimum of 12 feet from the front or street side property line and shall be located within a landscape island equal to a minimum of one-half the total sign area of the free standing sign.
- If the sign is lighted, it shall have indirect illumination in which the light source is from within the cabinet or is from an outside fixture that distributes the light evenly on the sign.

If the CPM notifies the project owner that revisions of the signage plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

Verification: At least 120 days prior to start of commercial operation, the project owner shall submit the TMPP signage plan to the CPM for review and approval. The project owner shall notify the CPM that the installed sign(s) is/are ready for inspection within 30 days of completion of installation.

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ATTACHMENT 1
LIGHTING COMPLAINT RESOLUTION FORM

LIGHTING COMPLAINT RESOLUTION FORM

THREE MOUNTAIN POWER PROJECT Burney, California
Complainant's name and address: Phone number:
Date complaint received: Time complaint received:
Nature of lighting complaint:
Definition of problem after investigation by plant personnel: Date complainant first contacted:
Description of corrective measures taken: Complainant's signature: _____ Date:
Approximate installed cost of corrective measures: $ Date installation completed: Date first letter sent to complainant: _____(copy attached) Date final letter sent to complainant: _____(copy attached)
This information is certified to be correct: Plant Manager's Signature:

(Attach additional pages and supporting documentation, as required.)

VISUAL RESOURCES APPENDIX A

Visual Resources Figures 2 through 4a

VISUAL RESOURCES Figure 2

KOP 1 (Existing View of Proposed Power Plant)

VISUAL RESOURCES Figures 2a

KOP 1 (Simulation)

VISUAL RESOURCES Figure 3
KOP 2 (Existing View)

VISUAL RESOURCES Figure 3a
KOP2 (Simulation)

VISUAL RESOURCES Figure 4

KOP 3 (Existing View)

VISUAL RESOURCES Figure 4a
KOP 3 (Simulation

VISUAL RESOURCES APPENDIX B

Commission Staff's Visual Assessment Methodology

METHODOLOGY FOR ASSESSING VISUAL SETTING

VISUAL FACTORS

Commission staff evaluated a number of factors in assessing the visual setting of the proposed project. These factors include visual quality, viewer sensitivity, visibility, and viewer exposure.

VISUAL QUALITY

The visual quality of a setting is the value of visual resources in that setting, determined by the visible environment's intrinsic physical properties and by associated cultural or public values (Andrews 1979; Smardon et al. 1986). Where publicly adopted goals, policies, designations or guidelines exist, they are given great weight in assessing visual quality. Where they do not exist, the analyst relies on experience and judgment to assess visual quality. The relevant physical properties of the environment include landform, vegetation, water, color, scarcity, and cultural modifications.

A basic premise in the evaluation of visual quality is whether a project will be compatible with the character of the landscape. In the case of predominantly natural settings, projects should be compatible with this character. It is possible for new structures to be compatible with predominantly natural settings if such settings already contain some structures that are considered compatible and the new structures are similar to the existing structures and do not appreciably change the balance of natural and cultural elements. However, in areas that appear to be totally natural, any modification that appears to be human-made will change the character of the area.

VIEWER SENSITIVITY

One of the principal factors evaluated in assessing the potential for visual impacts is the sensitivity level of potential viewers. Viewer sensitivity is a measurement of the level of interest or concern of viewers regarding the visual resources of an area. It is generally expressed as high, moderate, or low. Local values and goals affect a viewer's expectations regarding a visual setting (Blair 1980). Concern regarding a change to a visual setting is often due at least in part to the symbolic effect of the change. A basic document for visual impact assessment states that

> "more often it is symbolic meaning, not preference, which motivates our value judgments and reactions" (Schauman 1986, p.105).

A visual change can be perceived as a symbol of a threat to the cultural stability and identity of a group or community (Costonis 1982). Viewer sensitivity can be determined in two ways, directly through evaluation of viewer attitudes or indirectly using viewer activities.

VIEWER ATTITUDES (DIRECT)

The direct determination of viewer attitudes is normally done by surveying potential viewers. As mentioned above in the discussion on Visual Quality, the accurate determination of such information is very complex, involves well-designed, implemented and interpreted surveys, is usually labor intensive, and is usually expensive. Given these constraints and the mandated time schedule for power plant siting cases, it is generally not possible for Commission staff to conduct such a direct determination of viewer attitudes and be assured of accurate and valid results.

VIEWER ACTIVITIES (INDIRECT)

In situations where direct information on viewer sensitivity cannot be obtained, indirect methods are typically used in the visual profession to gain an insight as to viewers' sensitivity regarding visual resources. Land use is considered a "useful indirect indicator of likely viewer response" (Blair 1986), and activities associated with some uses can result in an increased awareness of visual or scenic resources (Headley 1992). Use activities associated with 1) designated parks, monuments, and wilderness areas, 2) scenic highways and corridors, 3) recreational areas, and 4) residential areas are usually highly sensitive. Commercial uses are generally less sensitive as activities, and views are often focused on those commercial activities. Large scale industrial or agricultural processing facility uses are usually the least sensitive because workers are focused on their work, and often are working in surroundings with relatively low visual value.

VISIBILITY

Another important factor in assessing the existing visual setting, and thus potential impact is the visibility of the project. Visibility can differ substantially between view locations, depending on screening and the effect of the location of the visual change in the view. The smaller the degree of screening, the higher the visibility usually is and the greater the potential impact is likely to be. One factor potentially affecting screening is the season. Deciduous trees that provide substantial screening in summer may provide little screening in winter. Angle of view is also important. The closer the feature is to the center of the view area, the greater the impact is likely to be. Meteorological conditions can also affect visibility. For example, fog can make a cooling tower plume or stack plume unnoticeable, given particular fog density and distance from the viewer to the plume. Another factor affecting visibility is time of day. Although projects are generally more noticeable during daylight hours, lighting can make project structures and plumes more noticeable at night than during the day.

VIEWER EXPOSURE

The degree to which viewers are exposed to a view by (a) their distance from the feature or view in question, (b) the number of viewers, and (c) the duration of view is called viewer exposure (Grinde and Kopf 1986). Viewer exposure is important in determining the potential for a change in the visual setting to be significant.

DISTANCE

As the distance between the viewer and the feature viewed increases, the perceived size of the feature and the ability to see details decreases. Distance zones may be usefully categorized as follows: foreground, or close-range; middleground, or mid-range; and background, or long-range. Within close-range distances, details such as surface textures and the fullest range of surface colors are clearly perceptible. Mid-range distances are characterized by visualization of complete surface features such as tree stands, building clusters, and small landforms. Long-range distances are dominated by the horizon and major landforms (Felleman 1986).

NUMBERS OF VIEWERS

Two measures of the number of viewers are important to consider in assessing the potential visual impact of a project. One is the absolute number of viewers. The other is the proportion of viewers in a viewshed who can see the project.

DURATION OF VIEW

The length of time that a view is visible to a viewer is another important factor to be considered in determining the importance of a view and the potential impact of a project. For a given activity, the longer the view duration, the greater the potential importance or impact. View durations range from a few seconds, as in the case of some travelers in motor vehicles, to a number of hours per day, in regard to some residential situations.

KEY OBSERVATION POINTS

The evaluation factors discussed above are considered in relation to Key Observation Point. Key Observation Points are chosen to provide the basis for evaluation of project impacts by comparing the appearance before and after project construction. Key Observation Points include locations which are chosen to be representative of the most critical locations from which the project will be seen. Additional Key Observation Points should be selected that represent typical views encountered in different classes of views within the viewshed, if they are not covered by critical viewpoints. Variables that should be considered in selecting Key Observation Points include relative project size, season, and light conditions.

METHODOLOGY FOR ASSESSING VISUAL IMPACTS

USE OF OBJECTIVE VS. SUBJECTIVE METHODS

The determination of visual resource impacts has traditionally been done using a completely subjective method relying exclusively on the knowledge and experience of the visual resources professional. The drawback to this approach is that it is difficult to relate the steps and process used in the analysis which lead to the conclusions which are drawn regarding visual impacts.

In the 1970s and 1980s, there was an attempt in the profession to develop more objective methods for determining potential impacts. While this led to a more understandable set of steps and processes, analyses often did not account for

unusual situations not addressed by the standard procedure or gave the false impression that they were totally objective.

In recent years visual resource analysts have been developing a synthesis, in which an objective methodology has been used to develop the categories and the analysis process to be used in analyzing visual impacts, at the same time explicitly recognizing that subjective values are involved in selecting factors and assigning weights to factors. It is important that subjective judgements be identified and defined to the extent possible.

KEY OBSERVATION POINTS

As previously discussed, Key Observation Points include locations which are chosen to be representative of the most critical locations from which the project will be seen. For linear projects such as power lines, additional Key Observation Points are selected that represent any special project or landscape features such as skyline crossings, river crossings, or substations.

Because each Key Observation Point represents a critical location, a typical view encountered in a class of view, and/or a special project or landscape feature, it also represents an important specific aspect of the viewshed that is susceptible to visual impacts. Therefore, the visual impact of a project is determined for each Key Observation Point, not from an "overall" perspective that masks the specific impacts.

MAJOR IMPACT EVALUATION FACTORS

For each Key Observation Point Commission staff considers the susceptibility to visual impact and the severity of impact are considered together to determine the significance of impact. The following sections explain how these two major factors are assessed and considered. Other potential causes of significant visual impacts, such as night lighting, visible emission plumes, and noncompliance with laws, ordinances, regulations, and standards, are addressed separately in this analysis.

SUSCEPTIBILITY TO IMPACT

The first step in evaluating the visual impact of a project from a particular Key Observation Point is to consider the elements of the existing visual setting (discussed previously), including visual quality, viewer sensitivity, visibility, and viewer exposure. Each of these factors is assessed as either high, moderate to high, moderate, low to moderate, or low. Staff combines these factors into a measure of the susceptibility of the view from a particular Key Observation Point to visual impact. A low value for any of the four factors generally results in low susceptibility to impact.

IMPACT SEVERITY

As previously discussed, the degree of visual impact that a project will cause depends on the degree of change resulting from the project upon visual character or visual quality, here called the impact severity. Commission staff considers both the relationship of the project to the other components visible in the landscape, and

blockage from view or elimination by the project of any previously visible components.

Relationship of the Project to Other Visible Components

Landscape Components

The three basic landscape components are land and water, vegetation, and structures.

Visual Elements

The basic elements of each physical component of a view include color, form, line, texture, scale, and spatial character. The impact of a project is assessed in terms of contrast in color, form, line, texture, and scale, as well as scale dominance and spatial dominance. Scale is the proportionate size relationship between an object and its surroundings. Absolute scale is the size of an object obtained by relating its size to a definitely defined standard (i.e., measurement). Relative scale is the relative size of objects; the apparent size relationship between landscape components. Sub-elements of scale include *scale dominance* (the scale of an object relative to the visible expanse of the landscape and to the total field of view of the human eye or camera) and *scale contrast* (the scale of an object relative to other distinct objects or areas in the landscape). *Spatial dominance* is the measure of the dominance of an object due to its location in the landscape. Regarding these three factors, a change has the greatest potential to cause impacts in regard to scale dominance, and the least potential in regard to scale contrast.

Assessment of Contrast

Staff assesses contrast with existing structures, vegetation, and land/water in regard to color, form, line, texture, and scale. Regarding these factors, contrast in color, form, or line has greater potential to cause impacts than contrast in texture or scale.

The magnitude of the visual impact of a project is measured by the degree of change that it causes. In regard to contrast, the degree of change depends partly on the existing levels and types of contrast. For instance, if existing structures already contrast strongly with natural features, the addition of a similar structure tends to cause a smaller change than if no structures already existed. In addition, the degree of contrast depends on the proximity of the project to the landscape component to which it is compared. If a project is superimposed on a component (such as body of water), the potential for contrast is greater than if the project is near such a landscape component, and even greater than if the project is far from the landscape component.

Factors Affecting Contrast

Among the basic characteristics of the visual setting previously discussed, distance is a factor in determining the visual contrast that a project will create. Increasing distance can decrease perceived contrast both by reducing the apparent size of project structures and by reducing clarity of view due to atmospheric conditions.

Several additional factors can also influence the degree of contrast that a project may cause. These include atmospheric conditions, light conditions, motion, seasonal changes, and recovery time (BLM 1986).

BLOCKAGE OR ELIMINATION OF EXISTING ELEMENTS

In regard to obstruction or elimination of previously visible components, the analysis evaluates any change between the visual quality of those components compared to the visual quality of the project. Blockage of higher quality visual elements by lower quality elements can cause impacts, potentially as great as those regarding scale dominance.

ASSESSMENT OF VISUAL IMPACT SEVERITY

VISUAL RESOURCES Table B-1 shows how staff calculates impact severity from each Key Observation Point.

DETERMINATION OF SIGNIFICANCE

Commission staff considers the following factors in determining whether a visual impact will be significant. These factors are not a complete listing of all the considerations that staff uses in its analyses, because many such considerations are site-specific.

State

The California Environmental Quality Act Guidelines make it clear that aesthetic impacts can be significant adverse impacts by defining Asignificant effect≅ on the environment to mean a Asubstantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including . . . objects of historic or aesthetic significance. (Cal. Code Regs., tit.14, ϶ 15382.) Appendix G, subdivision (b), of the Guidelines state that a project Awill normally have a significant effect on the environment if will have a substantial, demonstrable negative aesthetic effect.

VISUAL RESOURCES Table B-1
Staff's Visual Impact Severity Assessment Process

	SEVERITY SCORE				
	Extreme	**Strong**	**Moderate**	**Weak**	**Negligible**
SEVERITY FACTOR					
CONTRAST					
Color Contrast		High	Medium		Low
		Or	Or		or
Form Contrast		High	Medium		Low
		Or	Or		or
Line Contrast		High	Medium		Low
		Or	Or		or
Texture Contrast			High	Medium	Low
			Or	or	or
Scale Contrast			High	Medium	Low
			or	or	or
DOMINANCE					
Scale	Dominant	Co-Dominant	Subordinate		Insignificant
		Or	Or		or
Spatial		Dominant	Co-Dominant	Subordinate	Insignificant
VIEW BLOCKAGE	Substantial blockage of high quality view	Moderate blockage of high quality view or substantial blockage of moderate to high quality view	Minor blockage of high quality view, moderate blockage of moderate to high quality view, or substantial blockage of moderate quality view	Minor blockage of moderate to high quality view, moderate blockage of moderate quality view, or substantial blockage of low to moderate qual. view	Minor blockage of moderate, low to moderate, or low quality view; moderate blockage of low or low to moderate quality view; or substantial blockage of low quality view
COMBINED FACTORS	Two or more of the above factors with a severity score of strong.				

Local

As discussed above, Commission staff considers any local goals, policies or designations regarding visual resources. Conflicts with such laws, ordinances, regulations, and standards can constitute significant visual impacts.

Professional Standards

Professionals in visual impact analysis have developed a number of questions as a means of evaluating the potential significance of visual impacts (see, e.g., Smardon 1986). The questions listed below address issues commonly raised in visual analyses for energy facilities:

Will the project substantially alter the existing viewshed, including any changes in natural terrain?

Will the project deviate substantially from the form, line, color, and texture of existing elements of the viewshed that contribute to visual quality?

Will the project substantially degrade the existing visual quality of the viewshed or eliminate or block views of valuable visual resources?

Will the project significantly increase light and glare in the project vicinity, particularly night-time glare?

Will the project result in significant amounts of backscatter light into the night-time sky?

Will the project be in conflict with directly-identified public preferences regarding visual resources?

Will the project comply with local goals, policies, designations or guidelines related to visual quality?

Will the project result in a significant reduction of sunlight, or the introduction of shadows, in areas used extensively by the community?

Will the project result in a substantial visible exhaust plume?

Commission staff considers these questions, where applicable, in its impact assessment.

CONSIDERATION OF IMPACT SUSCEPTIBILITY AND IMPACT SEVERITY

For most operations impacts staff considers the assessment of the impact susceptibility in relation to the impact severity from each Key Observation Point to determine visual impact. Staff considers construction impacts, lighting impacts, and visible plume impacts separately.

Cumulative Visual Impacts

Staff reviews the proposed project and its related facilities as well as other past, present, and future projects in the vicinity to determine whether potential cumulative visual impacts will occur and whether those impacts will be significant. In addition, in the case of cogeneration facilities where the proposed power plant is to be part of an already existing industrial facility, this review examines whether the addition of the proposed project and its related facilities will result in cumulative visual impacts and whether they will be significant. If past activities have resulted in significant impacts, and the project will appreciably increase the total impact, the project will contribute substantially to a significant cumulative impact. When cumulative visual impacts are found to be significant, whether in relation to other proposed projects or to the host industry, feasible mitigation measures will be recommended to reduce those impacts.

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CULTURAL RESOURCES

Testimony of Kathryn M. Matthews

INTRODUCTION

This analysis discusses cultural resources that are defined as the structural and cultural evidence of the history of human development and life on earth. Evidence of California's early occupation is becoming increasingly vulnerable due to the ongoing development and urbanization of the state.

Cultural resource materials may be found nearly anywhere in California: along the ocean coastline and on coastal islands; along rivers and streams; in coastal and inland valleys and lowlands; throughout the coastal and inland mountain ranges; and throughout the interior deserts. Cultural resources may be found on the ground or may be found at varying depths beneath the surface. In some areas of the state, a sequence of settlements on the same site may cover multiple layers of cultural resources. In other areas, the distribution of cultural materials may be much more dispersed and seemingly unrelated.

Cultural resources are significant to our understanding of our culture, our history and heritage. Critical to the analysis of cultural resources are the spatial relationships between an undisturbed cultural resource site and the surface environmental resources and features, and the analysis of the locational context of the resource materials within the site and beneath the surface. These relationships provide information that can be used to piece together the sequence of human occupation and use of an area, and they begin to create a picture of the former inhabitants and their environment.

Staff's primary concerns in its cultural resource analysis are to ensure that all potential impacts are identified and that conditions are set forth which ensure no significant adverse impacts will occur. The determination of potential impacts to cultural resources from the proposed Three Mountain Power Project (TMPP) is required by the Siting Regulations of the California Energy Commission (Energy Commission) and by the California Environmental Quality Act (CEQA). Impacts to cultural resources may result either directly or indirectly during pre-construction, construction, or operation of the project. Cumulative impacts may be associated with the proposed project and other projects in the same area.

In California, many cultural resource sites are already known and the maps and records for these sites are on file at cultural resource information centers located throughout the state. Some of the known resource sites have also been designated as state historic landmarks and others have been listed on the National Register of Historic Places. However, many areas of the state have not been fully explored or mapped and there are cultural resources and sites that still remain undiscovered. The potential for the project to affect both known and unknown resources is addressed in this analysis. For this analysis, three aspects of cultural resources are addressed: prehistoric archaeologic resources, historic archaeologic resources, and ethnographic resources.

PREHISTORIC RESOURCES

Prehistoric archaeologic 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 California, the prehistoric period began over 10,000 years ago and extended through the 18th century when the first Euro-American explorers settled in California.

HISTORIC RESOURCES

Historic archaeologic resources are those materials 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, documents, or other evidence of human activity. Under federal and state requirements, cultural resources must be greater than fifty (50) years old to be considered of potential historical importance.

ETHNOGRAPHIC RESOURCES

Ethnographic resources are those materials important to the heritage of a particular ethnic or cultural group, such as Native Americans, African, European, or Asian immigrants. They may include traditional resource collecting areas, ceremonial sites, topographic features, cemeteries, shrines, or ethnic neighborhoods and structures.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Cultural resources are indirectly protected under provisions of the federal Antiquities Act of 1906 (Title 16, United States Code, § 431 et seq.) and subsequent related legislation, policies and enacting responsibilities, e.g. federal agency regulations and guidelines for implementation of the Antiquities Act. The following laws, ordinances, regulations, standards and policies apply to the protection of cultural resources in California. Projects licensed by the Energy Commission are reviewed to ensure compliance with these laws.

FEDERAL

Portions of the routes proposed for the electric transmission lines go across land managed by the US Forest Service (USFS). Therefore this portion of the project would become an "undertaking" according to federal definition and the USFS would become involved as the lead federal agency for cultural and paleontologic resources. If cultural resource sites are identified on non-federal lands and they meet federal criteria for eligibility for listing in the National Register of Historic Places, federal laws also would apply to these resources.

- National Environmental Policy Act (NEPA): Title 42, United States Code, section 4321-et seq., requires federal agencies to consider potential environmental impacts of projects with federal involvement and to consider appropriate mitigation measures.

- Federal Register 48, 44739-44738 190 September 30, 1983: Federal Guidelines for Historic Preservation Projects: The US Secretary of the Interior has published a set of Standards and Guidelines for Archaeology and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archaeological and historic properties. The Secretary's standards and guidelines are used by federal agencies, such as the Forest Service, the Bureau of Land Management, and the National Park Service. The State Historic Preservation Office refers to these standards in its requirements for selection of qualified personnel and in the mitigation of potential impacts to cultural resources on public lands in California.
- National Historic Preservation Act 16 USC 470 requires federal agencies to take into account the effects of their undertakings on historic properties through consultations beginning at the early stages of project planning. Regulations revised in 1997 (36 CFR Part 800 et. Sec) set forth procedures to be followed for determining eligibility for nomination, the nomination, and the listing of cultural resources in the National Register of Historic Places (NRHP). The eligibility criteria and the process are used by federal, state and local agencies in the evaluation of the significance of cultural resources. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the State Register of Historic Resources. Recent revisions to Section 106 in 1999 have emphasized the importance of Native American consultation.
- Executive Order 11593, "Protection of the Cultural Environment" May 13, 1971, (36 Federal Register, 8921) orders the protection and enhancement of the cultural environment through providing leadership, establishing state offices of historic preservation, and developing criteria for assessing resource values.
- American Indian Religious Freedom Act; Title 42, United States Code, Section 1996 protects Native American religious practices, ethnic heritage sites, and land uses.
- Native American Graves Protection and Repatriation Act (1990); Title 25, United States Code Section 3001, *et seq.* defines "cultural items", "sacred objects", and "objects of cultural patrimony"; establishes an ownership hierarchy; provides for review; allows excavation of human remains, but stipulates return of the remains according to ownership; sets penalties; calls for inventories; and provides for the return of specified cultural items.

NATIVE AMERICAN

The proposed project site and portions of the project-related linear facility routes lie within the ancestral lands of several Native American tribes. Staff is not aware of any LORS that would specifically apply to the proposed project but representatives of the Pit River Nation and several affected tribal bands have indicated they have strong concerns about the project's potential to affect resources within their ancestral lands. The boundaries of these lands have been confirmed and acknowledged by the federal government in a series of official documents, including the tribal constitution adopted in 1987.

STATE

- Public Resources Code, Section 5020.1 defines several terms, including the following:

  (j) "Historical resource" includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.

  (q) "Substantial adverse change" means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.

- Public Resources Code, Section 5024.1 establishes a California Register of Historic Places; sets forth criteria to determine significance; defines eligible properties; and lists nomination procedures. The criteria are essentially the same as those used to determine eligibility to the National Register of Historic Places (NRHP), but they also stipulate that some properties that may not retain sufficient integrity to meet NRHP standards, may still be eligible for the California Register.
- Public Resources Code, Section 5097.5 states that any unauthorized removal or destruction of archaeologic or paleontologic resources on sites located on public land is a misdemeanor. As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority or public corporation, or any agency thereof.
- Public Resources Code, Section 5097.98 defines procedures for notification of discovery of Native American artifacts or remains and for the disposition of such materials.
- Public Resources Code, section 5097.99 prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and sets penalties for these actions.
- Public Resources Code, section 5097.991 states that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated.
- Public Resources Code, section 21000, et seq, California Environmental Quality Act (CEQA). This act requires the analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.
- Public Resources Code, section 21083.2 states that, if a project may affect a resource that has not met the definition of an historical resource set forth in section 21084, then the lead agency may determine whether a project may have a significant effect on "unique" archaeological resources; if so, an EIR shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, such resources must be avoided; if they can't be avoided, mitigation measures shall be required. The law also discusses excavation as mitigation; discusses the costs of mitigation for several types of projects; sets time frames for excavation; defines "unique and non-unique archaeological resources";

provides for mitigation of unexpected resources; and sets financial limitations for this section.

- Public Resources Code, section 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial adverse change in the significance of a historic resource; the section further defines a "historic resource" and describes what constitutes a "significant" historic resource.
- CEQA Guidelines, Title 14, California Code of Regulations, section 15126.4 "Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects", sub-section (b) "Mitigation Measures Related to Impacts on Historical Resources". Subsection (b) discusses impacts of maintenance, repair, stabilization, restoration, conservation, or reconstruction of a historical resource; documentation as a mitigation measure; and 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, Title 14, California Code of Regulations, section 15064.5 "Determining the Significance of Impacts to Archaeological and Historical Resources". Subsection (a) defines the term "historical resources". Subsection (b) explains when a project may be deemed to have a significant effect on historic resources and defines terms used in describing those situations. Subsection (c) describes CEQA's applicability to archaeological sites and provides a bridge between the application of the terms "historic resources" and a "unique archaeological resources".
- CEQA Guidelines, Title 14, California Code of Regulations, section 15064.7 "Thresholds of Significance". This section encourages agencies to develop thresholds of significance to be used in determining potential impacts and defines the term "cumulatively significant".
- CEQA Guidelines, Appendix G: "Issue V: Cultural Resources". Lists four questions to be answered in determining the potential for a project to impact archaeological, historic, and paleontologic resources.
- California Penal Code, section 622.5. Anyone who willfully damages an object or thing of archaeological or historic interest can be found guilty of a misdemeanor.
- California Health and Safety Code, section 7050.5. If human remains are discovered during construction, the project owner is required to contact the county coroner.
- Public Resources Code, section 5097.98. If the county coroner determines that the remains are Native American, the coroner is required to contact the Native American Heritage Commission, which is then required to determine the "Most Likely Descendant" to inspect the burial and to make recommendations for treatment or disposition of the remains and any associated burial items.
- Executive Order W-26-92. By order of the governor, all state agencies must preserve and maintain all significant heritage resources of the state. This includes maintaining the resources under its control; directing its policies, plans, and

programs to preserve state-owned significant resources; ensuring that the protection of significant resources are given full consideration in all decisions, and consulting with the California State Office of Historic Preservation to ensure that plans and programs contribute to the preservation and enhancement of significant state-owned resources (TMPP 1999a).

- In addition, the order mandates that each state agency shall designate an Agency Preservation Officer to ensure that the agency's policies regarding the protection of resources within its jurisdiction are carried out. Finally, each agency is required to develop a cultural resources management plan that is reviewed annually. [TMPP 1999a, page 6.2-74].

LOCAL

Although the Energy Commission has pre-emptive authority over local laws, it typically ensures compliance with local laws, ordinances, regulations, standards, plans, and policies. The project site and associated linear facilities are all located within unincorporated portions of eastern Shasta County.

SHASTA COUNTY

According to the Application for Certification (AFC), the Heritage Resources Element of the Shasta County General Plan addresses cultural resources. The objective of this element is the protection of significant prehistoric and historic resources. Policy HRE-a states:

Development projects in areas of known heritage value shall be designated to minimize degradation of these resources. Where conflicts are unavoidable, mitigation measures which reduce such impacts shall be implemented. Possible mitigation measures may include clustering, buffer or non-disturbance zones, and building siting requirements (TMPP 1999a).

Shasta County staff presented a set of recommended mitigation measures for the TMPP in a letter to Commission staff, dated October 6, 1999. Item 3 of the county's statement of conditions addresses cultural resources (Kaminski 1999a). This condition is presented later in this section, in the discussion of mitigation measures.

ENVIRONMENTAL SETTING

REGIONAL DESCRIPTION

The project area is located in the central portion of the Cascade Range-Modoc Plateau Physiographic Province. The Cascade Range extends southward from southern British Columbia to California's Lassen Peak, located about 25 miles south of the project site. Over the past millions of years, ongoing volcanic activity produced numerous successive lava flows throughout this area, eventually building up the Columbia and the Modoc plateaus. The Modoc Plateau extends southward from the California border to the beginnings of the Sierra Nevada Range on the south and the vast Great Basin Province to the south and east (AFC 1999a). As the land rose with tectonic and volcanic activity, the early inland seas began to diminish.

With continuing volcanic activity and increasingly wetter climate conditions, fresh-water lakes formed, some of them covering vast areas of the western United States. The presence of water provided diverse types of habitat for a wide variety of wildlife – resources that were attractive and useful to humans (TMPP 1999a; b, c).

PROJECT VICINITY DESCRIPTION

The project site is located within the Burney Valley, between the unincorporated communities of Burney and Johnson Park. The 10.2-acre project site lies at an elevation of just over 3,100 feet above mean sea level (msl). The site is relatively flat but it is surrounded by volcanic cinder cones and mountains, some of which reach elevations of over 7,000 feet msl. Mount Lassen rises to over 10,000 feet msl and Mount Shasta rises to over 14,000 feet msl. These two peaks stand as boundary markers for the ancestral lands of the Native Americans who have inhabited the project area for thousands of years. Rock units from the volcanic flows originating from these surrounding peaks are the source of "obsidian" and "basalt" which are known from the archaeological record to have been quarried by prehistoric people to make stone tools. (TMPP 1999a).

In addition to the power plant site, several linear facilities will serve the TMPP. In general, the routes of these facilities cross lands that are relatively flat, some of them already disturbed by development and some of them still forested. The AFC described three alternative routes for the project natural gas supply line to connect to an existing PG&E pipeline. Alternative Route A runs about 2,900 feet southeastward from the project site through a stand of pine trees. Alternative Route B would run about 4,000 feet south through a stand of trees and then turn southwestward to follow the roadway. Alternative Route C would run about 8,000 feet within existing roadway easements (TMPP 1999a).

The TMPP would be served by a new 24-inch water supply pipeline that would run about 5,700 feet from existing wells to the project site. Under the initial proposal, wastewater was to be delivered by pipeline to the nearby Burney wastewater treatment plant but the applicant later proposed to develop its own percolation ponds on an adjoining parcel, for disposal of spent project water (TMPP 1999a, b, c).

A new transmission line on tubular steel poles would connect the project with existing PG&E electrical transmission lines located about 1,800 feet east of the project site. This route is relatively level and parallels an existing railroad track (TMPP 1999a).

The project would also necessitate the reconductoring of several existing PG&E transmission lines that run across level agricultural fields and then climb to cross a series of wooded hills, ridges, and canyons, before again leveling off to cross open grassland and large parcels in agricultural use. All together there would be a total of 88 miles of line to be reconductored. However, the actual distance over which the reconductoring project would take place is closer to 60 miles in length. A nine-mile section, plus a nineteen-mile section, of these routes contain two separate circuits that would each need to be reconductored. Approximately thirty-two miles

of the route would require only a single circuit to be reconductored (TMPP 1999a, 1999i).

Refer to the **Project Description** section of this document for maps of the project development region and the project area.

PREHISTORIC SETTING

Archaeological literature indicates that early residents of California typically lived near water sources that could provide them with access to a wide variety of plant and animal resources. Evidence from archaeological sites found throughout the project area indicates that native peoples may have occupied the project area, possibly as early as 5,300 years ago. The archaeological evidence seems to indicate a potential relationship between changes in the tool construction and use, hunting patterns, residential construction, and types of food resources utilized. The changes may be connected with movement of tribal groups within their ancestral lands and contact with other tribal groups through trade and social inter-action (TMPP 1999a; TMPP 1999d, e, f; Smithsonian 1978).

Excavation of archaeological sites began in the early 1900s and extended intermittently up through the 1980s. Based upon the archaeological data and materials recovered, as well as ethnographic records, archaeologists have proposed several different chronologies for the developmental sequence in the project region. Researchers noted several patterns and changes in the materials used for tools and in the food resources exploited by the Native Americans prior to contact with Euro-American explorers and settlers. The types of materials that have been found and the relative dates of the cultures that produced them are more fully described in section 6.2 of the AFC (TMPP 1999a, b, c, d).

As described in the AFC, known Native American prehistoric cultural resources in the project vicinity include archaeological sites representing residential bases, resource processing and tool production, field camps, and structures. Known resources recorded in the project area range from large, complex sites indicating residential use and including burials; to sites with a great abundance and diversity of cultural materials; to widely separated and isolated artifacts. Areas where large groups settled were clearly associated with the presence of water. Materials recovered include various types of stone tools, worked shell and bone, ornamental items, basketry and, after contact, metal and glass items and woven cloth (TMPP 1999a, b, c, d).

ETHNOGRAPHIC BACKGROUND

The TMPP site and immediate project area are located within the ethnographic boundaries of the Achumawi and Atsugewi tribes. Portions of the electric transmission routes to be reconductored include ancestral lands of the Yana and the Wintu. The Achumawi and Atsugewi, the Yana, and the Wintu tribes, as well as other groups no longer present, have occupied these lands for as long as they can recall (Pit River 1991 a, b). It is likely the pre-contact boundaries of their ancestral lands were changed and shrunk as Euro-American settlers began to intrude and take over traditional tribal holdings. The Yana tribe was particularly affected by the

arrival of settlers and by the early 20th century, few members remained (TMPP 1999a; Smithsonian 1978).

The AFC indicates that sites and resources present in the reconductoring corridor are particularly important because this route represents a transition sector from the upper Sacramento Valley to the southern Cascade Range and east to the Modoc Plateau. It also appears that the natural boundary between the Sacramento River and the interior canyons may coincide with the social boundaries between the tribal groups that were developed after Euro-American contact. For a more complete discussion of the various Native American groups who occupied the project area, please refer to section 6.2.1.2 of the AFC (TMPP 1999a, b).

As emphasized in the AFC, when boundaries for ethnographic territories and tribal affiliations were defined, they were derived from information provided by native speakers, but they were based upon interpretations of linguistic differences by Europeans and American researchers. It is also important to note that ethnologists and linguists did not really begin scientific study of the native groups and culture in the project area until the early twentieth century. Many changes had already taken place between the beginnings of the first Euro-American settlements in the 1830s and the beginnings of this research (TMPP 1999a; TMPP 1999b, c, d).

The AFC indicates that, at the time of the first descriptions of the native populations in the project area, the Yana occupied the upper Sacramento River valley and foothills east of the river. The Wintun occupied areas along the east bank of the river and out toward the foothills. The ethnographic record indicates there was friction between these groups, as well as between the Yana and neighboring tribes to the south. The ancestral lands of these groups are crossed by the route of the electric transmission facilities to be reconductored as part of the TMPP (TMPP 1999a).

Records indicate that the Achumawi and Atsugewi tribes occupied the immediate project vicinity in the 1830s. Historical records indicate there was Native American resistance to Euro-American settlement in the Burney Valley and in 1856 this led to a period of violent confrontation, destruction, and retaliation. Fort Crook was built in Fall River Mills in 1857 to establish a military presence in the area. In 1859 the state rounded up native residents who had survived these conflicts and moved them to the Round Valley Reservation in Mendocino County. Eventually, members of the Achumawi and the Atsugewi tribes began returning to their homelands near Burney. The Achumawi was sub-divided into nine tribelets (now called bands) and the Atsugewi were sub-divided into two tribelets or bands. Today these tribelets are now part of the Pit River Tribe or Nation (TMPP 1999a).

The Pit River Nation is comprised of eleven autonomous tribal bands, including the Madesi, the Itsatawi, the Atsugewi, the Aporige, the Atwamanini, the Ilwami, the Achomawi, the Hamawi, the Kosalektawi, the Astariwi, and the Hewisedawi. Each band has its own governing council and each band sends a representative to the Pit River Tribal Council. In addition, each band selects a cultural resource specialist to represent the interests and concerns of the band, as needed and appropriate to protect and preserve the tribal and band resources (the concerns include more than

just archaeological resources (TMPP 1999a; Carmony 1999c; Winn 1999a; Silvas 1999a).

Archaeological evidence in the ancestral lands of the Pit River Nation includes known occupation sites, spiritual and healing places, trails, hunting and resource procurement areas, burials, and sacred sites. Archaeological artifacts associated with the bands of the Pit River Nation include triangular projectile points of obsidian, basalt, and chert; bone and stone tools; shell beads and ornaments; baskets; stone pestles and mortars, stone manos and metates; (TMPP 1999a; TMPP 1999b, c, d).

HISTORIC SETTING

Spanish missionaries began their exploration and development of the missions in California, starting with the first mission in San Diego in 1769. For ease of access to Spanish ships, development of the missions was focused on areas along the coast and they were spaced within a reasonable travel distance apart. Native peoples were recruited to serve as laborers and often the missions relied upon soldiers to ensure that the workers remained to work the mission lands. Exploratory parties traveled inland along the waterways from the San Francisco Bay and Sacramento River delta areas to inventory California's resources but no new missions were established after those in San Rafael and Sonoma, in 1823.

The AFC indicates that contact between Euro-Americans and the native population in Northern California occurred relatively late in comparison to the earliest contacts with the Spanish Empire that occurred in southern and central California. However, the cultural changes and illnesses that resulted from the southern contacts had already reached and affected the lives of the northern peoples. As early as 1817, groups of trappers entered the Spanish Northwest, following watercourses in search of beaver. Trappers entered the Mexican territory with greater persistence in the 1820s and in 1821 the government launched an expedition to drive out rumored intruders. This expedition reached Cottonwood Creek which is located at the southern end of the transmission line corridor (TMPP 1999a; TMPP 1999 b, c,d).

Beginning in the 1830s, toward the end of the Spanish period and into the Mexican period, large tracts of land throughout California were granted to Mexican and other European settlers. This system was one of the most important influences on California history because it led to the eventual concentration of land ownership into the hands of a relative few. In Shasta County, a grant of 26,632 acres was obtained at San Buena Ventura to create the Rancho Buena Ventura. This was the second and last land grant issued in Shasta County in 1844 (TMPP 1999a; TMPP 1999b, c, d).

The AFC indicates that the gold rush stimulated an interest in the development of roads to reach the mining areas and markets. The need for transportation services for passengers and freight provided the impetus for development of a stagecoach system that eventually covered the state. The east branch of the California-Oregon Trail crossed rugged mountainous land after leaving the upper Sacramento Valley. Due to the difficulty of the terrain, alternative routes were developed and in 1846, Fremont and his party followed the Sacramento River up to Cottonwood Creek and

then turned northeastward and headed across what is now Shasta County. Today, Interstate 5 and the Shasta route of the Southern Pacific Railroad closely follow the route of the Old California-Oregon Trail, making it the oldest continuously used road in northern California (TMPP 1999a).

The AFC indicates that one of Shasta County's first settlers purchased land in 1856 and his holdings formed the nucleus of what is now the town of Anderson. His ranch became a stopping place for travelers on the California-Oregon Trail. The Reading adobe home once stood on the bank of the Sacramento River, near the confluence with Cottonwood Creek. Fort Reading (State Registered Landmark 379) was established in 1852 about six miles northeast of the town of Anderson and later abandoned in 1867. Sometime after 1850 the Dersch homestead (SRL 120) was established northeast of Anderson, using Indian labor from nearby rancherias. The town of Millville was settled in 1853 and the first grist mill was established in 1856 (TMPP 1999a).

The AFC indicates that the small community of Buzzard Roost was established in 1869 and this was the location of a stage stop in 1880s and the Round Mountain Post Office in 1882. A sawmill was constructed on top of Hatchet Mountain in 1872 and a flume (known as the Terry Lumber Flume) ran from the mill to the community of Bella Vista, via the area of Buzzard Roost. Roads, structures, springs, a power line, the Cedar School, Terry Mill Road, the abandoned Mountain School, a holding pond, and the historic community of Round Mountain are located within the project vicinity (TMPP 1999a).

The AFC indicates that the history of the northeasterly portion of the project area is equally rich. In 1857 or 58, Samuel Burney constructed a log cabin, barn and corral about a mile north of the modern town of Burney. Burney was killed in 1859 and the area was not occupied by Euro-Americans until 1869. An 1862 map does show the Oak Run Road running through the valley (TMPP 1999a).

The Burney Valley was primarily farm and ranch land until the town of Burney Valley began to take shape in the 1870s. The post office was established in 1872 and it also functioned as a stage stop, a trading post, and a saloon. The town began to grow as a service center for the surrounding area. As disenfranchised Native Americans began to return from the Round Mountain Reservation in Mendocino County, many of them took jobs on the ranches or in the developing timber industry (TMPP 1999a).

The AFC indicates that the timber industry grew to become the area's predominant industry by the twentieth century. The project area (called the Burney Tract) was originally owned by T. B. Walker, then acquired by the Red River Lumber Company, and in 1944 the land was purchased by the Fruit Growers Supply Company in order to ensure availability of wood for packing crates. At the time of this purchase, there was no link to a major rail transportation line so the Fruit Growers made plans for a sawmill and a railroad in Burney. However, by the 1950s, the fruit industry began to shift away from wooden crates to use of cardboard and plans for a new sawmill were dropped. In 1954 the Fruit Growers entered into a timber sale agreement with the McCloud River Lumber Company and in 1955 the McCloud River Railroad

extended rail lines into the town. The Fruit Growers Supply Company managed the timberlands on the Burney Tract on a sustained yield basis until the end of the contract period in 1985 (TMPP 1999a).

The AFC indicates that in 1917, PG&E became interested in development of hydro-electric resources on the Pit River, which is located about seven miles north of the TMPP site in Burney. In 1919 and 1920, PG&E purchased the land and the water rights and the Pit 1 generating plant went into commercial operation in 1922. The power was transmitted on 220 kV lines that ran 202 miles down to the new Vaca-Dixon substation at Vacaville (TMPP 1999a).

Pit 1 contained two of the largest hydro-electric generators in the country and it was the first of seven plants planned along the Pit River. Construction of Pit 3 began in 1923 and it was completed two years later. By the time the Pit 4 and 5 plants were completed, all of the land had been purchased, all residents had been removed, and all homes, barns, and other buildings had been dismantled. The AFC states that all the structures associated with PG&E in this area, like the transmission lines, are considered cultural resources (TMPP 1999a).

As described in the AFC, there are numerous known historical period resources of potential interest or concern located within the project area. Some of these known resources would include: transportation facilities such as the Panorama Point Road, and the Anderson-Cottonwood Canal, the Southern Pacific Railroad, the McCloud River Railroad, remnants of the Old California-Oregon Trail and alternative routes, stagecoach routes, and other early roads; power generation and transmission facilities; timber harvest and lumber milling facilities; early rancherias and homesteads; and early commercial operations and residential communities, as represented by buildings and other structures; sites; and districts (TMPP 1999a).

PRE-AFC LITERATURE AND RECORDS SEARCH

Prior to preparation of the AFC, consultants to the applicant conducted a literature search and reviewed site records and maps at the Northeast Information Center of the California Historical Resources Information System (CHRIS). These searches focused on areas located within one mile of the proposed TMPP site and the routes of all associated linear facilities. The record search for the routes of the electric transmission lines that are to be reconductored extended out to within one-quarter mile. Records indicated that, although this area had previously been surveyed, no cultural resources had been encountered. The records indicated that surveys of nearby areas located more than a mile outside the project site had encountered modern trash deposits. Surveys of a forest area involved in a land exchange did encounter prehistoric and historic sites and nearly two dozen isolates. Additional background and records searches were conducted at several institutions and several individuals were consulted (TMPP 1999a).

The linear facilities immediately associated with the project site include the natural gas supply pipeline, the water supply pipeline, the wastewater disposal pipeline, and the electrical line to interconnect with the existing PG&E facilities. The AFC refers to three alternative routes for the natural gas pipeline. The routes evaluated

were designated as "A", "B", and "C". During staff workshops, the applicant indicated that Route A was the preferred route for the gas pipeline. After the AFC was filed, the applicant decided to construct its own percolation ponds to handle wastewater disposal, rather than piping it to the local treatment plant. Among the resources identified within the project area were the McCloud River Railway, the Itsasawi Achumawi Village Site, Fort Crook Road, Historic State Route 299, and the PG&E transmission line (TMPP 1999a, b, c, d).

Corridors for the electrical transmission facilities to be reconductored to serve the TMPP, run in three directions from the project site and they contain existing transmission facilities. The literature and record search at the CHRIS included areas up to one quarter-mile radius from the project site and to either side of the center-line of the reconductoring corridor. The record search indicated that thirty-one (31) surveys have been previously conducted with one quarter mile of the reconductoring corridor but these surveys only covered about twenty percent of the total length of the corridor. Records indicate that forty (40) sites had previously been recorded within the APE for the reconductoring route (TMPP 1999a, b, c, d).

A brief summary of the results of the literature review and a brief description of the known resources is included in the AFC, in section 6.2.2.1 and in Table 6.2-4. In response to staff data requests, additional information was filed in September, October, and November. Site-specific information was filed with the Energy Commission under separate cover to maintain confidentiality of sensitive resource locations (TMPP 1999a, b, c; d, e).

PRE-AFC FIELD SURVEYS

Current state and federal guidelines recommend that survey records and maps more than five years old should be updated to determine whether any changes have occurred. The literature and record search indicated that portions of the project site and related linear facility routes had undergone previous surveys for archaeological resources but some of these surveys were completed more than five years ago. In October 1998 and again in February 1999, consultants to the applicant conducted a cultural resource survey of the entire project Area of Potential Effect (APE) to identify any cultural resources that might be present in the proposed project area. A transect of 20 meters was used for the new substation site and a corridor ten (10) meters wide was used for all other facilities. Ground visibility during October was good, while in February, visibility was down to forty percent due to snow coverage (TMPP 1999a).

Surveyors did identify the remaining segment of the McCloud River Railway and associated features. This railway was constructed in 1955 with parts salvaged from other railway facilities so the date components appear to go back to the early 1900s. Surveyors also identified the PG&E transmission facilities which appear to have been constructed prior to the 1940s. The surveyors were not able to identify the sites of the Itsasawi-Achumawi Village, Fort Crook Road, or Historic Route 299. No other cultural resources were found on the surface, most likely because the areas surveyed have been logged and the surface showed considerable disturbance (TMPP 1999a, b, c, d).

TRANSMISSION LINE RECONDUCTORING ROUTES

As described in the AFC, pedestrian surveys of the reconductoring corridor were conducted in April 1999. Nine archaeologists were divided into three-person crews who were under the direction of the principal archaeologist and the field director. The crews covered the corridor in parallel transects between twenty and thirty meters wide, depending upon the variability of the existing width of the corridors. Visibility of the ground surface along much of the route ranged from zero in grass-covered areas to nearly 100 percent in cleared or rocky areas. The AFC indicates that the corridor has been moderately disturbed due to a program of ongoing maintenance that includes vegetation clearing and some sub-surface disturbance, road cuts and re-grading, access by wheeled and tracked vehicles during maintenance activities (TMPP 1999a).

The AFC indicates that a total of 47 new sites were found during the field surveys and numerous previously recorded sites were relocated and the site record information was verified and updated, as needed. The location of several sites was field checked and they were found to be outside the footprint of the transmission corridor. A brief summary of the results of the surveys of the reconductoring corridor is included in the Table 6.2-5 of the AFC. While many of the known resources present in the reconductoring corridor may not be eligible for the National Register, no determination of potential eligibility has yet been made for the known sites. Further evaluation and testing will be needed to clarify the potential for the project to affect known, as well as unknown, cultural resources (TMPP 1999a, b, c, d, e).

Maps provided in the AFC indicated the presence of parcels of land under the jurisdiction of the US Forest Service (USFS) at several points along the route of the PG&E corridors to be reconductored cross (TMPP 1999a). Staff review of a current USFS map of the project area indicates that these lands have been withdrawn from forestry holdings. In preparing this testimony, staff met with the USFS archaeologist to review his maps and records and has requested his review and comment on the staff analysis of potential effects on cultural resources (Wise, 1999; 2000).

Members of the Pit River Nation indicated to staff that many areas along the reconductoring route were generally identified as being particularly sensitive. During staff workshops, TMPP indicated that no Native American monitors were included in the cultural resource survey crew for the AFC. In discussions with staff, Pit River representatives indicated that they feel additional surveys and testing will be required prior to the start of reconductoring and Native American monitor must be present (TMPP 1999a, b, c, d, e; Winn 1999a; Silvas 1999a; Carmony 1999a, b, c).

POST-AFC FIELD SURVEYS

In data requests subsequent to the AFC, staff requested that TMPP conduct additional survey work in the vicinity of the project site. Staff also requested revisions and clarification of the maps showing the areas surveyed and resource locations known in the corridor of the transmission line that is to be reconductored by PG&E. Additional field surveys at the project site and in the immediate vicinity

were completed and the information was provided to staff. Revised confidential maps of the transmission line routes were provided in October and November (TMPP 1999e, f).

ARCHITECTURAL RECONNAISSANCE

The summaries of the project area history and the identification of evidence of remaining historic facilities indicates that some degree of architectural reconnaissance took place but the discussion in the AFC does not specifically describe such a survey (TMPP 1999a). When staff visited the project area, they observed some farm buildings along the reconductoring corridor as it leaves the town of Burney. It is possible that these structures could be older than 45 years but a literature review was inconclusive. Staff also observed the old powerhouse and pipelines facilities at the site of the PG&E Pit Powerhouse No 3. These structures obviously are older than 45 years. However, the structures that staff observed are already influenced by the existing electric transmission lines and the proposed reconductoring is not expected to alter the existing setting for these facilities.

NATIVE AMERICAN CONTACTS

In 1998, prior to beginning the fieldwork and surveys, the consultant to the applicant contacted the state's Native American Heritage Commission (NAHC). The NAHC maintains a list and maps of traditional sacred sites located on public and private lands throughout the state. The Heritage Commission also can refer staff, applicants, consultants, and members of the public to Native Americans who have indicated they wish to be notified about projects in their area of interest. If Native American burials are encountered during project construction, the Heritage Commission will provide the name of a representative who will serve as the "most likely descendant".

In response to a request from the applicant's consultant for names of Native American individuals and organizations that might have an interest in the proposed project, the Commission provided a list of nine who could potentially provide information about traditional cultural properties. In October 1998, the applicant sent letters to the list of individuals and organizations seeking information by November 1998. No responses were received. Letters were also sent to this same list in April 1999, seeking information about cultural resources along the transmission corridor. No responses were received (TMPP 1999a).

In response to a request from the applicant's consultant for information on sacred lands within the project area, the Heritage Commission indicated that no sacred properties were identified within the project area (including the one-mile radius study area). The absence of sacred properties, however, does not mean that they may not exist since this information is often protected until a project actually appears to be approaching such a resource area. In its response, the NAHC provided a list of Native American contacts. Confidential Appendix C to the AFC contains a sample of the letter sent to the Native American representatives for the project area and a summary of the contacts undertaken (TMPP 1999a, b).

Until the Commission staff workshops in September 1999, there were no responses to the applicant's letters or inquiries. During this workshop, a member of the Pit River Nation indicated that letters were not an adequate means of communication and that consultation, in person, was required (Silvas 1999a). The Energy Commission's Public Advisor had met with members of the Pit River tribal council on several occasions prior to the workshop. During the workshop, staff and the applicant initiated additional discussion with tribal representatives and, in meetings subsequent to the workshop, have endeavored to maintain open communication. In early December, copies of the Preliminary Staff Assessment were provided to the current tribal council, the cultural resource information officer, and representatives of the bands affected by the reconductoring project. Shortly thereafter, the tribal offices were closed for an indefinite period and staff sent copies of the PSA to tribe and band representatives.

SUMMARY OF KNOWN CULTURAL RESOURCES WITHIN THE AREA OF PROJECT EFFECT

The record search and field surveys of the APE for the PG&E reconductoring project, indicate the presence of forty previously recorded sites plus forty-seven newly recorded sites. Many of the known resources have been disturbed or damaged to the extent that they may not be eligible for listing on the Register. However, regardless of the potential for a known site or resource to be eligible for the Register, these resources should be treated as potentially eligible and avoided during project construction and operation.

The AFC does not provide any information on the total number of previously recorded isolates nor on the number of newly recorded isolates (TMPP 1999a, b, c, d, e). While isolates, by definition, are typically not eligible for listing on the National Register of Historic Places or the California Register, they do provide an indicator of the potential for subsurface resources. Information on the location and types of isolated finds is typically included in the cultural resource portion of the AFC and related confidential filings.

The AFC indicates that the Burney extension of the McCloud River Railway, while not currently eligible for listing, could potentially become eligible in 2005 if the integrity of the resource remains unchanged between now and then. None of the known resources located within the APE of the reconductoring corridor have been evaluated for listing on the Register. Of the known resources located within one-quarter mile of the corridor, only two have been evaluated for the Register. The “Cow Creek petroglyph” site is listed on both registers but it is located more than one-quarter mile outside the reconductoring corridor. Resource site CA-Sha-1724 has been evaluated and found not to be eligible for the registers.

Since the evaluation of potential eligibility has not been conducted for the remaining sites within the reconductoring corridor, they will be treated as though they are significant and appropriate mitigation measures are to be implemented to protect them. Many of these sites have both prehistoric and historic components. Additional testing prior to the start of the reconductoring project is recommended to assist in making a determination of eligibility.

CATEGORIZATION OF IDENTIFIED CULTURAL RESOURCES

Various laws apply to the treatment of cultural resources. These laws require the Energy Commission to categorize resources by determining whether they meet several sets of specified criteria. These categories then in turn influence the analysis of potential impacts to the resources and the mitigation that may be required to ameliorate any such impacts.

Under federal law, only historical or prehistoric sites, objects or features, or architectural resources that are assessed by a qualified researcher as "important" or "significant' in accordance with federal guidelines typically need to be considered during the planning process. The significance of historical and prehistoric cultural resources is judged in accordance with the criteria for eligibility for nomination to the National Register of Historic Places as defined in 36 CFR 60.4. If such resources are determined to be significant, and therefore eligible for listing in the National Register, as well as the California Register, they are afforded certain protection under the National Historic Preservation Act and/or CEQA. The Advisory Council on Historic Preservation, for example, must be given an opportunity to comment on any federally-funded or permitted undertaking that could adversely affect such resources.

The National Register criteria state that "eligible historic properties" are: districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that (a) are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or (d) that have yielded or may be likely to yield, information important to history or prehistory. Isolated finds, by definition do not meet these criteria. California has adopted a very similar set of criteria, for assessing resources of statewide importance.

Under federal law, resources determined not to be significant, that is, not eligible for National Register listing, are subject to recording and documentation only, and are afforded no further protection. However, occasionally certain resources, although they may not be assessed as "significant", may nonetheless be of local or regional importance such that mitigation may be warranted regardless of their assessed significance. Staff evaluates the survey reports and site records for any known resources located within or adjacent to the project APE to determine whether they meet the eligibility criteria.

The record and literature search and the walking surveys of the proposed project APE were conducted to identify the presence of any cultural resource sites or materials. Where resources were identified, additional evaluation is conducted to determine whether the resources are already listed on, or are potentially eligible for listing on either the National Register of Historic Places (National Register) [36 CFR 800] or the California Register of Historic Resources. The determination of eligibility

is made in compliance with the applicable provisions of the National Historic Preservation Act.

Beginning in 1999, the state Resources Agency adopted considerable revisions to the regulations implementing California Environmental Quality Act (CEQA). These changes affected the language applicable to staff's analysis of cultural resources. Previously, the bulk of the information on how to assess resource and impact significance and on the types of mitigation measures available was contained in Appendix K of the CEQA Guidelines. Much of the language of that appendix has now been incorporated into Title 14, Code of California Regulations, sections 15126.4 and 15064.5.

The CEQA guidelines now explicitly require the lead agency (in this case, the Energy Commission), to make a determination of whether a proposed project will affect "historic resources". The guidelines provide a definition for historic resources and set forth a listing of criteria for making this determination. As used in CEQA, the term "historic resources" includes any resource, regardless of age, as long as it meets these criteria. If the criteria are met, the Energy Commission must evaluate whether the project will cause a "substantial adverse change in the significance of that historic resource", which the regulations define as a significant effect on the environment. The recent CEQA changes also indicate that the mitigation for impacts to historic resources that meet these criteria shall not be subject to the limitations provided in PRC section 21083.2.

Using the above criteria, staff has determined that the cultural resource sites described in the AFC and in subsequent filings for the TMPP meet one or more of the criteria for being an historical resource. As such, staff recommends full mitigation during project construction and operation activities, in order to protect these resources.

CEQA also contains a section addressing "unique" archeological resources and provides a definition of such resources (Public Resources Code, section 21083.2). This section establishes limitations on analysis and prohibits imposition of mitigation measures for impacts to archeological resources that are not unique. However, the CEQA Guidelines state that the prohibition in this section does not apply when an archeological resource has already met the definition of a historical resource (California Code of Regulations, section 15064.5). Since staff has determined that the sites for which it is recommending mitigation do meet the definition of historical resources, the prohibition does not apply to the mitigation discussed in this staff assessment.

IMPACTS

Since site preparation and project development and construction usually entail surface and sub-surface disturbance of the ground, the proposed TMPP has the potential to adversely affect both known and previously unknown cultural resources. For many other types of resources, the effects of ground disturbance during

construction are often deemed "temporary" since they generally occur only during construction-related activities.

However, for cultural resources the potential for temporary effects really does not exist. Once cultural resource materials have been encountered or disturbed during project site preparation or during project construction, the effect upon cultural resources is permanent and extends for the lifetime of the project. The only examples of a "temporary effect" on cultural resources that come to mind would be if access to a known site or resource were blocked for a period of time. Or if there were a short-term intrusion of modern-day construction noises or dust in a historic district, or scaffolding surrounding a historic building. Typically, once these activities are completed, the temporary effects would be alleviated.

The potential for permanent effects to occur to cultural resources would be associated with direct damage to, or destruction of, known resources that are not protected during construction activities or damage to, or destruction of, previously unknown resources that are unexpectedly encountered during construction ground disturbance. Permanent effects to cultural resources may occur if sensitive resource areas are used for parking or storage because any resources present could be compressed, or dislocated, or damaged. Permanent effects may also occur with the development and use of new access roads to an area previously inaccessible, thereby providing an opportunity for project personnel or members of the public to collect or vandalize a site. Ongoing maintenance of pipelines and other linear facilities also have the potential to have permanent effects on cultural resources over an extended period of time.

PROJECT SPECIFIC EFFECTS

Project-related effects may occur either directly or indirectly, as a result of activities associated with the pre-construction site preparation, construction, operation, and/or closure of the project. A project may also have effects that can be part of an overall, cumulative perspective. According to CEQA Guidelines, direct impacts are defined as those impacts that are directly attributable to the project and they are occurring at the same time and place. For cultural resources, direct impacts are those which may result from the disturbance of resources, whether from vegetation removal; heavy equipment or other vehicle parking on, or travel over, the ground surface; earth-moving activities; or trenching and excavation.

According to CEQA Guidelines, indirect impacts are caused by the project, but they can occur later in time or farther removed in distance, but are reasonably foreseeable and related to a proposed project. For cultural resources, indirect impacts may result from increased erosion due to site clearance and preparation. Project-related improvement in access to sensitive resource areas may lead to inadvertent damage or outright vandalism to exposed resource materials.

POTENTIAL FOR PROJECT EFFECTS

Often the potential for project construction activities to impact previously unknown cultural resources cannot be fully evaluated until the sub-surface soils have been exposed by grubbing, grading, excavation, trenching, and/or augering. However, an

assessment of the potential for discovery of cultural resources can be made, based on the results of the literature review and the field surveys. The presence of known sites of historical interest near the project site and linear routes, as well as the presence of numerous known sites of historic and prehistoric value within the PG&E reconductoring corridor; the recorded occurrence of numerous isolates; and the evidence of human habitation over a period of thousands of years -- all occurring in proximity to the proposed project APE -- indicate that construction of the proposed project has the potential to encounter previously unknown cultural resources.

Thus, the potential for the TMPP to impact previously unknown cultural resources is directly related to the likelihood that such resources are present and whether they are actually encountered during project development and construction activities. Even the potential for discovery of cultural resources is not a measure the full significance of individual artifacts or other cultural resources present since it is impossible to accurately predict what individual artifacts or sites have not yet been discovered.

THE POTENTIAL FOR "ADVERSE CHANGES" TO HISTORIC RESOURCES

Based upon NEPA, the Warren-Alquist Act and the Energy Commission siting regulations, the Commission staff must evaluate the potential for significant impacts to cultural resources. Based upon CEQA, the Commission staff must evaluate the "potential for adverse changes in the significance of historic resources". Not all cultural resources are the same, nor do they offer the same degree of information or insight into past human activities and adaptations to their environment.

Professional experience, the literature, and the records of previously discovered cultural resources all provide a means of assessing the relative value of a newly discovered site or a recently unearthed resource. Significant cultural resources are those that meet established and generally accepted scientific criteria. The significance of any cultural resource sites or materials recovered during project construction is assessed by a qualified cultural resource specialist and often can only be evaluated after they have been mapped and recorded, collected, prepared and analyzed by professional archaeologists and historians and cultural resource specialists.

The AFC and supplementary filings indicate that no cultural resource sites or isolates have yet been recorded within the one-quarter mile study zone surrounding the proposed power plant site or corridors of project-related linear facility routes. There is a potential for the reconductoring of the electric transmission facilities to impact nearly sixty (60) known cultural sites unless final location of pull and tension sites and access road improvements avoid surface disturbance in the vicinity of these resources. Many of the known resources may lack the integrity to meet the eligibility criteria for listing in the Register but several potentially eligible sites are known to exist. Additional testing and analysis must be conducted in the vicinity of the pull sites to fully evaluate the potential for impacts (TMPP 1999a, b, c, d).

For this project, the majority of potential impacts to cultural resources would be associated with the construction phase of the project, during disturbance of the ground surface and subsurface. Given the presence of known cultural resources throughout the project area, the sensitivity of the project area is moderate to high. It is likely that additional, previously unknown cultural resources may be discovered during project construction. At this time the number of sites, both known and unknown, that cannot be avoided is uncertain. Likewise, the potential significance of an unknown resource cannot be determined until it has been discovered and evaluated by qualified professionals.

POWER PLANT SITE

As described in the AFC, the elevation of the proposed 10.2-acre plant site slopes gently from an elevation of 3,145, to 3,120 feet mean sea level (msl). In preparing for project construction, the site will be leveled to an average elevation of 3,140 feet above msl. Soil in this area has been previously disturbed by logging and previous construction of an adjacent 10 MW power plant. After the TMPP site is leveled and holes for foundations have been excavated, concrete mat foundation pads will built at grade level to support the power generation equipment (TMPP 1999a).

WATER SUPPLY PIPELINE

The TMPP will be connected to the Burney Water District pipeline by a new one-mile long, 24-inch pipeline. The pipeline will be buried in a trench at least six feet deep and four feet wide. Vegetation clearance, movement of the trenching equipment, and stockpiling of the excavated spoils will disturb the ground surface up to fifty or seventy-five feet in width. Additional ground disturbance may occur unless construction vehicles are restricted to a zone or band of maximum disturbance (TMPP 1999a).

NATURAL GAS SUPPLY PIPELINE

The natural gas supply pipeline will follow the same 2,900 foot route as an new 4-inch pipeline that is being installed to serve the existing 10 mw power plant on the parcel adjacent to the proposed TMPP site. Construction of this pipeline is scheduled to begin in November 1999, prior to certification of the TMPP project and it is unclear whether mitigation for cultural resources will be required (TMPP 1999a).

WASTEWATER DISPOSAL PONDS

These ponds will require the clearance of five acres of land adjacent to the TMPP site and the excavation of three percolation ponds. The surface dimensions and depth of the ponds were provided in the applicant's water supply analysis prepared by its hydro-geology consultant (TMPP 1999a; Lawrence 1999*).

ELECTRIC TRANSMISSION LINE ROUTE(S)

The proposed route for the electric transmission line miles would run about 1800 feet from the TMPP project site to connect into a pair of existing PG&E 230-kV transmission lines. This route parallels an existing railroad track, and would cross land that has been modified by logging and the construction and operation of the railroad. This portion of the route is easily accessible from existing roads. While no

surface evidence of cultural resources was observed during surveys, previously unknown cultural resources could be present below the surface and could be unexpectedly impacted by construction (TMPP 1999a, b, c, d).

The transmission lines will be strung on tubular steel poles and the spans between poles would average about 700 to 800 feet. A total of six poles will be needed to carry the lines to the point of interconnection with the PG&E facilities (AFC 1999a, 1999i). Construction of foundations for the transmission structures will require drilling into the soil to variable depths for each power pole. The depth of soil disturbance will depend on the height and diameter of the individual transmission poles designed for each portion of the route. Typically, the diameter of the holes being augered for the power poles would be about six feet. For poles placed at angle points or where extra strength is needed, the diameter of the holes needed for the poles may be as much as ten feet (TMPP 1999a; 1999i). The width and extent of surface soil disturbance would depend upon the size of equipment needed to set and erect the poles and the amount of construction work that can be accomplished from existing, disturbed areas or roads.

RECONDUCTORING PROJECT

At least twenty pull sites will be required for the reconductoring project. These sites will be spaced between two and four miles apart, depending upon terrain and design requirements. The surface dimensions of each pull site will also vary, depending upon terrain but the use of the pull sites will require vegetation clearance and grading of approximately three acres of land. No new access roads will be required for the reconductoring project. Some of the existing roads may need to be repaired if they are damaged by seasonal erosion. Existing access roads may need to be re-graded and improved to handle the ground vehicles needed to carry the new conductors to the route and to remove the old conductor materials. The new insulators will be transported to the tower locations and the old insulators removed by helicopter. The final span(s) of conductor to be installed between the top of the ridge and the Pit No 3 powerhouse may also be installed by helicopter due to the steep terrain and great change in elevation (TMPP 1999a, 1999i).

While the transmission line routes have already experienced considerable disturbance from previous development and on-going maintenance, there is always a potential for previously unknown cultural resources to be encountered during vegetation clearance and grading of the ground surface for structures and facilities.

CUMULATIVE IMPACTS

According to CEQA Guidelines cumulative impacts are associated with the construction and operation of other, similar projects occurring in the same area or region or occurring in the same general time frame. For cultural resources, cumulative impacts may occur if increasing amounts of land are cleared and disturbed for the development of multiple projects in the same vicinity as the proposed project. The potential for cumulative impacts may be associated with the proposed construction of a fiber optic cable along a route that may run parallel to portions of the PG&E transmission corridor, in the vicinity of the TMPP. The cable project is experiencing some delay due to protests by residents in nearby

communities. Staff continues to gather information on this project in determine the potential for cumulative effects.

Proposed developments such as the TMPP site and its associated linear facilities, in conjunction with other development projects, will increase the amount of land exposed to public access and potential removal or damage to cultural resources. The combined effects of such development can accelerate the potential for continued disturbance of cultural resource sites and the loss of valuable scientific information. The level of cumulative impact will grow as increasing development opens more undisturbed areas and eventually exposes highly sensitive cultural resource sites.

There is increasing potential that important resources will be inadvertently lost or destroyed during project construction. Implementation of appropriate mitigation measures is essential to the protection of valuable cultural resources and for the recovery of information on earlier climate patterns and human adaptations to these environmental conditions. Staff encourages ongoing consultation and cooperation between the project owner, the Native American representatives, and local citizens to facilitate the protection and mitigation of sensitive and/or significant cultural resources sites.

The incremental effect of this project is likely to contribute to a significant cumulative impact in, or adjacent to, the PG&E reconductoring corridors. At this time, the process of establishing the boundaries of known sites within the corridors and assessing their potential significance has not been completed. The process of determining the presence of significant cultural resources will continue into the construction phase of this project. The applicant can mitigate impacts to both undetermined and identified sites to less than significant by following the recommendations for monitoring and mitigation set forth in the conditions of certification.

IMPACTS OF FACILITY CLOSURE

PLANNED CLOSURE

The anticipated lifetime of the Three Mountain project is expected to be at least thirty-five years. It is anticipated that upgrades or modifications made prior to the facility's closure might extend the life of the plant. Closure would be caused by either (1) a natural or manmade disaster or economic difficulty, or (2) planned, orderly closure that will occur when the plant becomes economically non-competitive.

At the time of closure, all then-applicable LORS will be identified and the Energy Commission-required closure plan will address compliance with these LORS. Generally, if no additional ground disturbance occurs during closure activities and all conditions of certification have been met, no impacts to cultural resources would be expected. However, actual potential impacts are more likely to depend upon the final location of project structures in relation to existing resources, and then upon

the procedures used for the removal of project structures. Since the spatial relationship between the closure and removal of project structures and sensitive resources cannot be determined at this time, no conclusion can be drawn at this time with respect to the impact of facility closure on cultural resources.

UNEXPECTED TEMPORARY CLOSURE

According to the AFC, an emergency, unplanned closure, would probably be temporary. The applicant's plan, if this type of closure occurs, would be to keep everything ready to start-up as soon as the emergency is over. In this sort of situation, there is unlikely to be any impact to cultural resources (AFC 1999a).

UNEXPECTED PERMANENT CLOSURE

If a site were abandoned, impact to cultural resources would be unlikely because there would be no immediate soil disturbances. Over time, depending on the need to disturb the ground to accomplish project closure and facility removal, some disturbance of known and/or previously unknown, cultural resources might result. Project-related facilities on federal lands may be required to be returned, as nearly as possible, to pre-project conditions.

MITIGATION

The AFC indicates there are no known or observed prehistoric cultural resources within the 100-foot study zone around the TMPP site and along the routes for the associated linear facilities. The AFC indicates that numerous historic and prehistoric sites have previously been found on the surface within the PG&E reconductoring corridors. Since project development and construction usually entail disturbance of the ground surface, as well as disturbance below the surface, the proposed project has the potential for sub-surface excavation to encounter sub-surface cultural resources. The presence of cultural resource materials beneath the surface of the project area is difficult to determine until the ground is opened by excavation, trenching, or augering, so the extent of potential impacts often cannot easily be evaluated prior to construction. The applicant intends to use archaeological methods to determine the presence of sites and avoid them, if possible.

The preferred mitigation for impacts to cultural resources is avoidance of the resource. If previously unknown cultural resources are encountered during site clearance and preparation, or during project construction, and they cannot be avoided, then contingency measures must be in place to protect these resources. Staff's objective is to ensure that there will be no adverse impacts to significant cultural resources during project development and construction.

Critical to the success of any mitigation effort is the selection of a qualified professional cultural resources specialist. This designated specialist must have the authority to halt or redirect work if cultural resources are encountered. Commission staff must review the qualifications and approve of the professional archaeologist designated by the project owner to lead and participate in project monitoring and mitigation efforts. Given the number of known prehistoric sites within the project

APE, staff recommends that a qualified Native American Observer assist the designated cultural resource specialist in monitoring pre-project site clearing and project construction activities and to advise in the avoidance of sacred sites.

Mitigation measures are recommended to reduce the potential for adverse project impacts on the project region's cultural resources to a less than significant level. While certain types of impacts, such as the demolition of an historical structure or disturbance of human remains, cannot be mitigated to a less than significant level, staff has developed a series of conditions of certification that would help ensure the mitigation of project impacts to the extent possible. The proposed conditions are presented below in the approximate sequence in which they would be implemented and include specific time requirements to reflect a phased or staged sequence implementation prior to, during, and following project construction.

The proposed mitigation measures would apply to any potential for impacts to sensitive cultural resources, in all areas affected by the project. Mitigation measures are derived from good professional practice and they are based on the US Secretary of Interior guidelines, and Commission staff recommendations. All of these mitigation measures have previously proven successful in protecting sensitive cultural resources from construction-related impacts, while allowing the timely completion of many projects throughout California.

APPLICANT'S PROPOSED MITIGATION

As indicated in the AFC and in the confidential filings, any known cultural resource sites will be avoided wherever possible. The applicant has recommended that all known, recorded sites will be presumed to retain some degree of integrity. And, if they have not yet been formally evaluated for significance or importance, they are assumed to be, at minimum, an "important" resource under CEQA, or they are potentially eligible for listing on the National Register under 36 CFR section 60.4(d).

MITIGATION MEASURES IN THE AFC

In the AFC, the applicant recommended a program of mitigation measures that would apply to any known or newly discovered cultural resources within the project APE. These proposed mitigation measures were presented in section 6.2.5 of the AFC and are to be incorporated into the Cultural Resource Monitoring and Mitigation Plan that is to be prepared, as described in the proposed Conditions of Certification. The mitigation measures set forth in the AFC include:

- *Avoid damage to the McCloud River Railway.* The project design will avoid any damage to the McCloud River Railway, the abandoned railroad grade, and associated features of the railroad. CEQA requires that only effects to significant cultural resources be mitigated. The McCloud River Railway is not currently considered a significant resource but will likely become one in the year 2005. In maintaining the spirit of the CEQA, Executive Order W-26-92, and Shasta County Policy HER-a, Three Mountain Power, LLC, will take steps to avoid or minimize damage to this resource. To construct the PG&E substation and electrical transmission tie-in lines, a crossing will be built for

trucks to access the area. The crossing will be constructed so as to minimize impacts to the McCloud River Railway.

- *Implement mitigation measures*. For archaeological sites, mitigation usually consists of data recovery through excavations to retrieve the data that would be lost through disturbance. For extant cultural features, mitigation usually consists of photographic, graphical, and textual documentation to record the data that would be lost through disturbance.
- Additionally, if modifications to the project are made that add unsurveyed area to the project, these areas must also be surveyed and any resources will be evaluated.
- Prepare and implement a plan for the unanticipated discovery of cultural resources. Because of the moderate potential for cultural resources in the project area and the limitations of surface techniques, previously unknown cultural resources may be discovered during construction. A plan to manage these resources must be developed by the Three Mountain Power, LLC and, at a minimum, must include the following components.
- If cultural resources, such as chipped or ground stone, historic debris, building foundations, or human bone, are discovered during construction activities, the construction contractor must:
- stop work in that area within 100 feet of the find;
- notify the CEC; and
- have an archaeologist assess the significance of the find, and if necessary, develop appropriate treatment measures in consultation with California Office of Historic Preservation.
- If human bone is found as a result of any construction activity, the construction contractor will stop work and notify the Shasta County coroner in compliance with California Public Resource Code Section 5097.
- Continue dialogue with community members during construction activities to ensure that traditional cultural properties are identified. Because traditional cultural properties are frequently not identified until construction activities are taking place, the contractor, at a minimum, provide the Pit River Tribe of California, Burney City Council, Burney Chamber of Commerce, and the Burney branch of the Shasta County Library with monthly construction updates. Updates will summarize construction work over the past month, report any cultural resources discovered as a result of the month's construction, and identify work to take place during the upcoming month. A correspondence file will be maintained of all contact with these organizations. Telephone updates are acceptable if telephone logs and conversation notes are kept.

The following mitigation measures are proposed to reduce the likelihood of impacts to cultural resources in the PG&E reconductoring corridor:

- Identify and avoid known cultural resources. All known cultural resources along the transmission line corridor will be temporarily fenced and designated as environmentally sensitive areas. A ten-meter buffer beyond the resource

boundary will be utilized for fencing and fencing will conclude prior to the commencement of any transmission work. All trespass within a fenced area will be prohibited. If resources can't be avoided, the following mitigation measure will be implemented:

- Prepare and implement a significance evaluation, effects analysis, and mitigation plan for known resources in the project area that can't be fenced and avoided. As described above, the known cultural resources will be fenced and avoided, and it is unlikely that any of the resources identified during the field survey will be unavoidably impacted by the reconductoring effort. As required by procedures outlined in the California Environmental Quality Act and the National Historic Preservation Act, however, steps must be taken to evaluate the significance of cultural resources that cannot be avoided. Significance is determined by applying the criteria of the California Register of Historic Resources and the National Register of Historic Places. If resources are determined to be significant, an effects analysis must be undertaken to assess the effects of the proposed project on the significant resources. If the proposed project would have adverse effects on significant resources, measures to mitigate these effects will be developed and implemented.
- Prepare and implement a plan for the unanticipated discovery of cultural resources. Because of the potential for cultural resources in the project area and the limitations of surface survey techniques, previously unknown cultural resources may be discovered during construction. A plan to manage these resources will be developed and will include the following components:
- All ground disturbing construction within 50 meters of a known cultural resource will be monitored by an archaeologist under the supervision of an individual meeting the US Secretary of Interior's proposed historic preservation professional qualification standards for archaeologists. All ground disturbing construction activities taking place greater than 50 meters from a known cultural resource will be monitored by a construction crew supervisor with training in the identification of cultural resources as specified in the Educational Program section below.
- If cultural resources, such as chipped or ground stone, historic debris, building foundations, or human bone, are discovered during ground-disturbing activities, the construction contractor must :
- Stop work in that area within 100 feet of the find;
- Notify the California Energy Commission and, if on National Forest land, the Shasta-Trinity National Forest [Winfield Henn, Shasta-Trinity National Forest, 2400 Washington Avenue, Redding, CA 96001; (530) 242-2245]; and
- Have the archaeologist assess the significance of the find, and, if necessary, develop appropriate measures in consultation with the California Office of Historic Preservation.
- If human bone or other human remains are found as a result of any construction activity, the construction contractor will stop work and notify the Shasta County coroner in compliance with California Public Resources Code Section 5097. If human bone is found on National Forest land, the construction

contractor must stop work in the area of discovery, protect the human remains and any artifacts, immediately notify the National Forest Service and with written confirmation. The Forest Service contact for this project is Winfield Henn, Shasta-Trinity National Forest, 2499 Washington Avenue, Redding, CA 96001, (520) 242-2245. Construction may resume no later than 30 days after certification by the Forest Service of receipt of the written confirmation of notification of inadvertent discovery (TMPP 1999a).

- *Educational Programs*. For areas in which any ground disturbing activities will take place without the presence of am archaeological monitor, construction crew supervisors will receive 0.5 hours of training in recognizing cultural resources and the procedures to follow if resources are discovered. The training will be conducted by an individual meeting the US Secretary of Interior's proposed historic preservation professional qualification standards for archaeologist. A record of all individuals receiving training will be kept (TMPP 1999a).

The AFC concludes that implementation of the foregoing mitigation measures would be effective by either ensuring the avoidance of cultural resources, or by mitigating unavoidable impacts to less than significant (TMPP 1999a).

PIT RIVER NATION MITIGATION MEASURES

Representatives of the Pit River Nation indicated to staff that the tribe as a whole and the individual bands affected by project construction expect to be consulted with and involved in any plans or proposals for monitoring and mitigation of impacts to cultural resources. Typically, the designated representatives of the tribe and the affected bands consult with a project applicant to prepare and implement a Memorandum of Understanding (MOU) or a Project Agreement (PA), relative to involvement of the Pit River Nation during pre-project surveys and in pre-construction monitoring and mitigation activities. For the proposed TMPP project site and the associated linear facilities, such agreements would need to be executed between the tribe and the project owner (Carmony 1999a, b).

In addition, for the PG&E transmission line reconductoring project, such agreements must be executed between the project owner and PG&E, who will be leading this part of the project. The tribe's Cultural Resource Information Officer also expressed an interest in the project construction subcontractors being informed of the contents, requirements, and importance of the agreements and they must indicate commitment to their implementation (Carmony 1999c).

YANA TRIBE MITIGATION MEASURES

Confidential supplements to the AFC indicate that portions of the electric transmission line route between the Round Mountain and Cottonwood substations lie within the ancestral lands of two different divisions of the Yana Tribe – the Northern and the Central. Members of this tribe were severely decimated by the early 20th century and staff was unable to identify an active tribal organization.

WINTU TRIBE MITIGATION MEASURES

Confidential supplements to the AFC indicate that the final portion of the electric transmission route between the Round Mountain and Cottonwood substations lies within the ancestral lands of the Wintu tribe. Staff spoke with a representative of the Redding Rancheria to determine their interests and requirements. The tribal chairman did not anticipate any problems with the reconductoring project. However, if any prehistoric resources were encountered, the tribe would require all work to be halted until the resource could be evaluated and no data or artifact recovery or removal would be allowed (Benneman 2000).

US FOREST SERVICE MITIGATION MEASURES

The United States Forest Service (USFS) has responsibility for oversight and protection of cultural resources on federally-managed lands. At the time of the original FERC licensing, portions of the PG&E transmission line route crossed forest lands and they were subject to USFS requirements. Following a land exchange program, no land parcels along the transmission reconductoring route currently fall within USFS jurisdiction. However the USFS is participating in the PG&E re-licensing process before the Federal Energy Regulatory Commission (Macdougall 1999a; Wise 1999a).

Under the prior Programmatic Agreement for the existing PG&E transmission lines, as well as under the Lassen National Forest Resource Management Plan, mitigation measures are required to identify and protect cultural resources. Existing USFS conditions require that, if cultural resources are encountered during construction or operation activities within the leasehold, all activities in the vicinity of the find will immediately be halted and an archaeologist must be consulted to evaluate the find. Activities in the vicinity of the find must remain halted until the archaeologist has made the evaluation and any necessary mitigation measures have been completed (USFS 1962a, b, c; FERC 1989, 1991).

Staff has provided the USFS with copies of the CEC staff analyses and has requested comments and recommendations on cultural resource mitigation and data recovery. The USFS archaeologist indicated that he could draw from the Commission's adopted conditions of certification if a USFS permit were required for project-related activities on forest lands (Wise 1999a, 1999b).

FEDERAL ENERGY REGULATORY COMMISSION

The operation of the Lake Britton Reservoir, the hydro power generation plants along the Pit River (Pit River Powerhouses No 3, 4, and 5), and the operation of the existing PG&E electric transmission lines, including the route between the TMPP site and the substation at the Pit No 3 powerhouse, are subject to licensing agreements between PG&E and the Federal Energy Regulatory Commission (FERC). These parties are now in the second year of a five-year license renewal process. The PG&E facilities are subject to a Programmatic Agreement that was originally signed in 1989 and 1991 (FERC 1989, 1991). The Programmatic Agreement includes conditions placed on these facilities during previous licensing procedures will be reviewed and brought up to date (MacDougall 1999a, b; Wise

1999a; Carmony 1999c). It is unclear to staff whether FERC would have a jurisdictional role in cultural resource mitigation for the proposed reconductoring of the existing electric transmission lines between the project site and the Pit River No 1 and 3 substations.

CALIFORNIA PARKS AND RECREATION MITIGATION MEASURES

Staff has spoken with the ranger in charge at the Burney Falls State Park about potential concerns with the PG&E reconductoring project and potential for impacts to the park. The park service apparently currently manages the lands around the Lake Britton Reservoir through an agreement with PG&E. The park manger indicated that this agreement could be affected by the current FERC re-licensing process but he has no information on any potential changes (Nielsen 1999a, b).

SHASTA COUNTY MITIGATION MEASURES

Shasta County is the local agency responsible for permitting various types of surface activities in the project area. In a letter to Commission staff, the county presented a set of conditions that it would impose on the proposed project. Condition 3 is pertinent to cultural resources. This condition states:

"If, in the course of development, any archaeological, historical, or paleontological resources are uncovered, discovered, or otherwise detected or observed, construction activities in the affected area shall cease and a qualified archaeologist shall be contacted to review the site and advise the County of the site's significance. If the findings are deemed significant by the Environmental Review Officer, appropriate mitigation shall be required" (Shasta County/Kaminski 1999a).

STAFF'S PROPOSED MITIGATION MEASURES

The preferred mitigation for impacts to cultural resources is avoidance of the resource. If previously unknown cultural resources are encountered during site clearance and preparation, or during project construction, and they can not be avoided, then contingency measures must be in place to react promptly to protect these resources and to mitigate any potential significant impacts. Staff recommends that sites, for which significance has not been formally assessed, will be presumed to be important or significant until a determination of significance has been made and reviewed by OHP. The fact that a resource is not listed in or determined to be eligible for listing in the register does not preclude a lead agency from determining that the resource may be an historical resource.

Members of the Pit River Nation have actively participated in discussions with Energy Commission staff, regarding their concerns about protecting sensitive cultural resources located on their ancestral lands. Staff recommends that the project owner obtain qualified Native American Observer(s) to assist the designated cultural resource specialist in monitoring pre-project site and reconductoring route clearing and project construction activities and to advise the specialist on the avoidance of sacred sites.

Commission staff concurs with the mitigation measures proposed by the applicant in the AFC and in supplemental filings. Staff has adapted the applicant's proposed

mitigation measures into a series of conditions of certification, sometimes rewording for clarification and adding time frames and other requirements. The changes would extend the mitigation contingency planning to address the following aspects in greater detail, including: 1) Energy Commission staff review and approval of the qualifications of professional archaeologists proposed for project monitoring and mitigation efforts; 2) requiring the presence of qualified Native American monitor(s) 3) recovery of any sensitive cultural resources prior to impact by project activities; 4) recordation and analysis of all pertinent data and scientific information from the site(s) and any recovered cultural resources; 5) curation in a qualified repository, of the data and materials recovered; 6) preparation of recovered materials to the point of identification and completion of an inventory of materials prepared for curation; 7) preparation of a final report on data recovery efforts associated with project mitigation; and 8) filing of pertinent maps, photos, and other information with the curated materials. These measures are incorporated into the conditions of certification specified below.

Staff's proposed conditions were discussed in public workshops by the applicant, members of the Pit River Nation and affected bands, staff of interested agencies, and other parties and members of the public. Staff has revised the conditions in response to written and oral comments received during and after the workshops. Adoption of staff's proposed conditions of certification is expected to reduce the potential for adverse project impacts on the region's cultural resources to a less than significant level.

The proposed mitigation measures would apply to any potential for impacts to sensitive cultural resources in all areas affected by the project. Mitigation measures are derived from good professional practice and they are based on the US Secretary of Interior's guidelines, and staff's experience and recommendations. The mitigation measures set forth in the conditions have been applied to previous projects before the Commission and they have proven successful in protecting sensitive cultural resources from construction-related impacts, while allowing the timely completion of many projects throughout California.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

As discussed in the AFC, no prehistoric cultural resources have been previously recorded or encountered during surveys of the TMPP site and related linear facility routes. For the PG&E reconductoring projects, however, the AFC noted that there are nearly sixty known, recorded cultural resource sites located within the corridor. The AFC mentioned that twenty isolates were recorded during one survey in the TMPP site area but the total number of isolates recorded within the project area and reconductoring corridors was not provided in the AFC.

Since numerous prehistoric sites and isolates have been recorded within the project area, there is a strong possibility that project construction could encounter potentially significant cultural resources. The presence of resources on the surface

can sometimes indicate the presence of additional resources below the surface or in proximity to the surface finds. However, the absence of surface resources does not preclude the presence of subsurface deposits and the applicant has recommended that any project-related excavation in the vicinity of these sites should be closely monitored (TMPP 1999a; TMPP 1999b, c, d).

Of the more than sixty known, recorded sites within the TMPP site and vicinity and within the PG&E reconductoring corridors, two have completed the eligibility determination process. Of these two determinations, one was listed on the National Register of Historic Places and the California Register of Historic Resources, and the other was not. While many of the sixty previously recorded resources may not ever be eligible for listing on the registers, an eligibility determination has not been completed for all known, recorded resources. Nor has an eligibility determination been initiated for new, as-yet-undiscovered, cultural resource sites. Until such an eligibility determination has been made, the applicant expects to treat cultural resource sites as potentially eligible (TMPP 1999a; TMPP 1999b, c, d).

The Energy Commission is now required to make findings as to the presence of historic resources in the area potentially affected by a project and to draw conclusions as to the potential significance of the resources and/or the impacts. Staff has determined that the known resource sites described in the AFC and in the confidential technical reports meet one or more of the criteria needed to identify them as "historical resources". Staff has reviewed the discussions of the materials recorded at the various known sites found within one-quarter mile of the project APE. Staff has reviewed the recommendations of the applicant's archaeological specialist and has incorporated them into the proposed conditions of certification.

Staff has consulted with the Cultural Resource Information Officer and the cultural resource specialists for the affected bands of the Pit River tribe and the tribal chairman for the Redding Rancheria. Staff expects to receive comments from the USFS archaeologist, prior to Commission certification and anticipates that the Commission's conditions could be adapted if needed, into any permit requirements that the USFS or FERC may have for any portion of the project that would come under federal oversight.

Staff has incorporated the various cultural resource mitigation measures into a proposed set of conditions of certification for the TMPP. The cultural resource conditions of certification are presented as a means of anticipating potential impacts directly associated with the TMPP and they are expected to reduce any potential for adverse impacts to prehistoric and historic resources to a less than significant level. Very critical to the success of the recommended monitoring and mitigation program is the maintenance of an on-going, open and responsive consultation with designated representatives of the Pit River Nation and each affected tribal band.

The proposed Conditions of Certification are set forth below as a series of steps or activities that are intended to be completed in a phased sequence, during project-related pre-construction, construction, post-construction, and operation activities. For instance, the preparation of a monitoring and mitigation plan by the designated cultural resource specialist cannot take place until final project design and site maps

have been completed, the designated specialist has been approved by the CPM, and any necessary final surveys have been completed.

Now that the construction of new power plants is responding to market forces, an applicant or a project owner frequently anticipates starting project construction as soon as they receive the Commission's decision on certification. It is crucial to recognize that such construction cannot begin until the adopted Conditions of Certification have been complied with. If the start of project construction begins immediately after certification, conditions with extended lead times must be initiated prior to certification.

Staff believes that construction of the TMPP can be accomplished in a manner that can avoid potential adverse changes to the significance of the known prehistoric and historic resources. The potential for adverse changes to as yet undiscovered additional cultural resources will remain unknown until, and unless, such resources are encountered. Staff concludes that, if the proposed conditions of certification are implemented by qualified professionals and knowledgeable Native American monitors, in a timely and proper manner, the project will be in compliance with the applicable LORS.

RECOMMENDATIONS

Staff recommends the designation of a qualified professional cultural resource specialist to implement all cultural resource conditions of certification. Staff also recommends monitoring by the designated specialist and by qualified Native American monitors throughout the pre-construction and construction periods, as needed, and the implementation of appropriate mitigation measures wherever cultural resources are encountered. Monitoring and mitigation by a qualified cultural resource specialist and Native American monitor are essential to reduce the potential for project impacts to cultural resources to a less than significant level.

Staff recommends that the Energy Commission adopt the following proposed conditions of certification, to ensure mitigation of potential impacts to sensitive cultural resources during the construction of the TMPP. For impacts associated with the PG&E reconductoring project, staff recommends that permit conditions or requirements of the US Forest Service, the Federal Energy Regulatory Commission, the Pit River Nation and the affected bands, the Redding Rancheria, the State Department of Parks and Recreation, and Shasta County (as applicable) be incorporated into the Energy Commission's Conditions of Certification for cultural resources. And, through co-ordination with these agencies, staff would expect that Energy Commission conditions would likewise be incorporated into their respective contracts or agreements or conditions for the TMPP site and linear facilities or the PG&E reconductoring project.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the

movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall provide the California Energy Commission Compliance Project Manager (CPM) with the name and statement of qualifications for its designated cultural resource specialist who will be responsible for implementation of all cultural resources Conditions of Certification.

Protocol: The statement of qualifications for the designated cultural resource specialist shall include all information needed to demonstrate that the specialist meets the minimum qualifications set forth below, including the following:

a. a graduate degree in archaeology and cultural resource management;
b. at least three years of archaeological resource mitigation and field experience in California; and
c. at least one year's experience in each of the following areas:

- leading archaeological resource field surveys;
- leading site and artifact mapping, recording, and recovery operations;
- marshalling and use of equipment necessary for cultural resource recovery and testing;
- preparing recovered materials for analysis and identification;
- determining the need for appropriate sampling and/or testing in the field and in the lab;
- directing the analyses of mapped and recovered artifacts;
- completing the identification and inventory of recovered cultural resource materials; and
- preparing appropriate reports to be filed with the receiving curation repository, the SHPO, all appropriate regional archaeological information center(s).

The statement of qualifications for the designated cultural resource specialist shall include:

1) a list of specific projects the specialist has previously worked on;
2) the role and responsibilities of the specialist for each project listed; and
3) The names and phone numbers of contact persons familiar with the specialist's work on these referenced projects.

Verification: At least ninety (90) days prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall submit the name and statement of qualifications of its designated cultural resource specialist to the CPM for review and written approval.

At least ten (10) days, but no more than thirty (30) days, prior to the start of any project-related earth disturbing action, the project owner shall confirm in writing to

the CPM that the approved designated cultural resource specialist will be available at the start of project-related site preparation and earth moving activities, and is prepared to implement the cultural resource Conditions of Certification.

At least ten (10) days prior to the termination or release of a designated cultural resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated cultural resource specialist.

CUL-2 Prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall provide the designated cultural resource specialist and the CPM with maps and drawings issued for the construction site plan and site layout, the final alignment of all linear facilities, and the location of all auxiliary work areas. . The routes for the linear facilities shall be provided on 7.5-minute quad maps, showing:

a. post mile markers (including "tic marks" for tenths of a mile);
b. final center lines and right-of-way boundaries; and
c. the location of all the various areas where surface disturbance may be associated with project-related access roads, storage yards, laydown sites, pull sites, pump or pressure stations, switchyards, electrical tower or pole footings, and any other project components.

The designated cultural resource specialist may request, and the project owner shall provide, enlargements of portions of the 7.5 minute maps presented as a sequence of strip maps (or other acceptable format approved by the designated specialist) for the linear facility routes. The strip maps would include post mile and tenth of a mile markers and show the detailed locations of proposed access roads, storage or laydown sites, tower or pole footings, and any other areas of disturbance associated with the construction and maintenance of project-related linear facilities. The project owner shall also provide copies of any such enlargements to the CPM and the Native American monitor(s) at the same time as they are provided to the specialist. Any changes thereafter should be mapped and provided to the specialists in the daily briefings referenced in CUL-9 and to the CPM in the Monthly Compliance Report.

Verification: At least seventy-five (75) days prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall provide the designated cultural resource specialist and the CPM with final drawings and site layouts for all project facilities and maps at appropriate scale(s) for all areas potentially affected by project construction. If the designated cultural resource specialist requests enlargements or strip maps for linear facility routes, the project owner shall also provide a set of

these maps to the CPM and the Native American monitor(s) at the same time that they are provided to the specialist.

CUL-3 Prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner and the designated cultural resources specialist shall consult with Native American tribal representatives to identify affected tribes or bands and to develop an agreement(s) for qualified Native American (Pit River and Wintun tribes, as appropriate) monitors. The monitors must be present during the pre-construction and construction phases of the project and throughout the reconductoring project.

Verification: At least sixty (60) days prior to start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall provide the CPM with a copy of all finalized agreements for Native American (Pit River and Wintun tribes, as appropriate) monitors. If efforts to obtain the services of qualified tribal monitors prove unsuccessful, the project owner shall immediately inform the CPM and who will initiate a resolution process.

CUL-4 All Conditions of Certification adopted by the Energy Commission relative to the reconductoring, shall be extended to Pacific Gas and Electric Company (PG&E) (or any successor or assignees) and to its contractor for the reconductoring project. Prior to vegetation clearance, surface disturbance, site grading, or site preparation, the project owner shall enter into a legally binding agreement with PG&E to require PG&E, and any successors or assignees, and its contractors to participate in the TMPP employee awareness training program for cultural resources and to require the use of qualified Native American (Pit River and Wintun tribes, as appropriate) monitors in the pre-project surveys and in all reconductoring activities on those routes which are to be reconductored to carry the power produced by the TMPP.

Verification: At least sixty (60) days prior to vegetation clearance, surface disturbance, site grading, or site preparation, the project owner will provide the CPM with a copy of its finalized agreement with PG&E and its contractors that meets the requirements of this condition. Any proposal by either party to terminate the agreement will be submitted to the CPM for review and consideration of approval, in consultation with appropriate federal, state, and local agencies.

CUL-5 Prior to the start of earth disturbing activities related to the transmission line reconductoring, the designated cultural resources specialist and a qualified Native American (Pit River and Wintun tribes, as appropriate) monitor shall conduct reconnaissance surveys and any necessary presence/absence testing, data recovery and significance evaluation of the

final pull sites and any other areas expected to be affected by the reconductoring project. Surveys of the reconductoring routes shall use the centerlines and rights-of-way delineated by the survey stakes placed for final project engineering and design.

During the surveys, potentially sensitive cultural resource areas that must be protected during construction and operation shall be mapped and listed for specific monitoring and/or mitigation measures to be described in the Cultural Resources Monitoring and Mitigation Plan to be prepared per Condition CUL-6, below.

Verification: At least sixty (60) days prior to the start of earth disturbing activities related to the reconductoring project, the designated cultural resources specialist and Native American monitor(s) shall conduct reconnaissance surveys of the final pull sites and all other areas expected to be affected by the reconductoring project. Within ten (10) days after completion of the surveys, the project owner shall submit a letter summarizing the dates, methodology and preliminary findings of the survey to the CPM for review and approval.

CUL-6 Prior to the start of project vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the designated cultural resources specialist shall prepare, and the project owner shall submit to the CPM for review and written approval, a Cultural Resources Monitoring and Mitigation Plan (CRMMP), identifying general and specific measures to minimize potential impacts to sensitive cultural resources.

Protocol: The Cultural Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:

a. A proposed research design that includes a discussion of questions that may be answered by the mapping, data and artifact recovery conducted during monitoring and mitigation activities, and by the analysis of recovered data and materials. It shall provide details of the data needed to address the research issues and the methods proposed to obtain such data.
b. A discussion of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the pre-construction, construction, and post-construction analysis phases of the project.
c. Identification of the person(s) expected to perform each of the tasks; a description of each team member's qualifications and their responsibilities; and the reporting relationships between project construction management and the mitigation and monitoring team.
d. A discussion of the inclusion of Native American (Pit River and Wintun, as appropriate) observers or monitors, the procedures to be used to select them, the areas or post-mile sections where they will be needed, and their role and responsibilities.

e. A discussion of measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects.
f. A discussion of where monitoring of project construction activities is deemed necessary by the designated cultural resource specialist. The specialist will determine the size or extent of the areas where monitoring is to occur and will establish the percentage of the time that the monitor(s) will be present.
g. A discussion of the requirement that all cultural resources encountered will be recorded and mapped (may include photos) and all significant or diagnostic resources will be collected for analysis and eventual curation into a retrievable storage collection in a public repository or museum that meets the standards and requirements for the curation of cultural resources set forth at Title 36 of the Federal Code of Regulations, Part 79.
h. A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during construction.
i. Identification of the public institution that has agreed to receive any data and cultural resources recovered during project-related monitoring and mitigation work. Discussion of any requirements, specifications, or funding needed for the materials to be delivered for curation and how they will be met. Also include the name and phone number of the contact person at the institution.

Verification: At least sixty (60) days prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall provide the Cultural Resources Monitoring and Mitigation Plan, prepared by the designated cultural resource specialist, to the CPM for review and written approval.

CUL-7 Prior to the start of project vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the designated cultural resources specialist shall prepare an employee training program. The project owner shall submit the cultural resources training program to the CPM for review and written approval.

The training program shall discuss the potential to encounter cultural resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training program shall also include the set of resource reporting procedures and work curtailment procedures that workers are to follow if previously unknown cultural resources are encountered during project activities. The training program shall be presented by the designated cultural resource specialist or qualified individual(s) approved by the CPM and may be combined with other training programs prepared for biological resources, paleontologic resources, hazardous materials, or any other areas of interest or concern.

Verification: At least sixty (60) days prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall submit to the CPM for review and written approval, the proposed employee training program, the set of reporting procedures, and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during construction. The project owner shall provide the name and resume of the individual(s) performing the training.

CUL-8 Prior to the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, and throughout the project construction period as needed for all new employees, the project owner shall ensure that the designated cultural resource trainer(s) provide(s) the CPM-approved cultural resources training to all project managers, construction supervisors, and workers. The project owner shall ensure that the designated trainer provides the workers with the CPM-approved set of procedures for reporting any sensitive resources that may be discovered during project-related ground disturbance and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during construction.

Verification: Within seven (7) days after the start of project-related vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, the project owner shall provide the CPM with documentation that the designated cultural resources trainer(s) has/have provided to all project managers, construction supervisors, and workers hired before the start of construction the CPM-approved cultural resources training and the set of reporting and work curtailment procedures.

In each Monthly Compliance Report after the start of pre-construction activities, the project owner shall provide the CPM with documentation that the designated cultural resource trainer(s) has/have provided to all project managers hired in the month to which the report applies, the CPM-approved cultural resources training and the set of resource reporting and work curtailment procedures.

CUL-9 The designated cultural resource specialist or the specialist's delegated monitor(s), shall have the authority to halt or redirect construction if previously unknown cultural resource sites or materials are encountered during project-related grading, augering, excavation and/or trenching.

If such resources are found and the specialist determines that they are not significant, the specialist may allow construction to resume. The project owner shall notify the CPM of the find as set forth in the Verification.

If such resources are found and the specialist determines that they are or may be significant, the halting or redirection of construction shall remain in effect until:

- the designated cultural resources specialist has notified the CPM of the find and the work stoppage;
- the specialist, tribal representatives, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed; and
- Any necessary data recovery and mitigation has been completed.

The designated cultural resources specialist, the tribal representatives, the project owner, and the CPM shall confer within five working days of the notification of the CPM to determine what, if any, data recovery or other mitigation is needed.

If data recovery or other mitigation measures are required, the designated cultural resource specialist, tribal monitors, and team members shall monitor construction activities and implement data recovery and mitigation measures, as needed.

All required data recovery and mitigation shall be completed expeditiously unless all parties agree to additional time.

Verification: Thirty (30) days prior to the start of construction, the project owner shall provide the CPM with a letter confirming that the designated cultural resources specialist and delegated monitor(s) have the authority to halt construction activities in the vicinity of a cultural resource find.

For any cultural resource encountered that the specialist determines is or may be significant, the project owner shall notify the CPM within 24 hours unless there is an intervening weekend. If there is an intervening weekend, the project owner shall notify the CPM on the Monday following the weekend.

For any cultural resource encountered that the specialist determines is not significant, the project owner shall notify the CPM within 72 hours after the find and provide written documentation of the evaluation.

CUL-10 Prior to the start of vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of

heavy equipment or other vehicles onto or over the project surface, and each week throughout project construction (the period involving any ground disturbing activities, including landscaping), the project owner shall provide the designated cultural resource specialist and the CPM with a current schedule of anticipated project activity in the following month and a map indicating the area(s) where the construction activities will occur. The designated cultural resources specialist shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s).

Verification: At least thirty (30) days prior to the start of vegetation clearance; ground disturbance and grading; site or project mobilization; site preparation or excavation activities; implementation of erosion control measures; or the movement or parking of heavy equipment or other vehicles onto or over the project surface, and in each Monthly Compliance Report thereafter, the project owner shall provide the designated cultural resource specialist and the CPM with a week-by-week schedule of the upcoming earth disturbing activities, construction, and mitigation activities, including those to be implemented by other specialists, on or off the APE. The project owner shall also provide maps, showing where construction activity is to take place. These advance schedules are to be provided to the CPM with the Monthly Compliance Report. The project owner shall notify the CPM when all ground disturbing activities, including landscaping, are completed.

CUL-11 Throughout the pre-reconductoring surveys and the monitoring and mitigation phases of the project, the designated cultural resources specialist and delegated monitor(s) shall keep a daily log describing the area and nature of the work, any resource finds, and the progress or status of the resource monitoring, mitigation, preparation, identification, and analytical work being conducted for the project. The daily logs shall indicate by tenths of a post mile, where and when monitoring has taken place, where monitoring has been deemed unnecessary, and where cultural resources were found.

The designated specialist shall prepare a weekly summary of the daily logs on the progress or status of cultural resource-related activities.

The designated resource specialist and delegated monitor(s) may informally discuss the cultural resource monitoring and mitigation activities with Commission technical staff.

Verification: Throughout the project-related pre-construction and construction periods, the project owner shall ensure that the daily log(s) and the weekly summary reports prepared by the designated cultural resource specialist and delegated monitor(s) are available for periodic audit by the CPM. Upon request by the CPM, the project owner shall provide specified weekly summary reports to the CPM.

CUL-12 The designated cultural resource specialist or delegated monitor(s) shall be present at times the specialist deems appropriate to monitor pre-construction and construction-related grading, excavation, trenching, augering, or other disturbance of existing surface in the vicinity of previously

recorded archaeological sites and in areas where cultural resources have been identified.

If the designated cultural resource specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner of the changes. The designated cultural resource specialist shall use milepost markers and boundary stakes placed by the project owner to identify areas where monitoring is being reduced or is no longer deemed necessary.

Verification: During any earth disturbing activity and throughout the project construction period the project owner shall include in the Monthly Compliance Reports to the CPM copies of the weekly summary reports prepared by the designated cultural resource specialist regarding project-related cultural resource monitoring.

CUL-13 The project owner shall ensure that the designated cultural resource specialist performs the recovery, preparation for analysis, analysis, preparation for curation, and delivery for curation of all cultural resource materials encountered and collected during pre-construction surveys and during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files, copies of signed contracts or agreements with the individuals, museum(s), institutions, which will ensure the necessary recovery, preparation for analysis, and analysis of cultural resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for the life of the project and the files shall be kept available for periodic audit by the CPM. Information as to the specific location of sensitive cultural resource site shall be kept confidential and accessible only to qualified cultural resource specialists.

CUL-14 Following completion of data recovery and site mitigation work the project owner shall ensure that the designated cultural resources specialist prepares a proposed scope of work for the Cultural Resources Report. The project owner shall submit the proposed scope of work to the CPM for review and written approval.

The proposed scope of work shall include (but not be limited to):

a. A discussion of any analysis to be conducted on recovered cultural resource materials;
b. discussion of possible results and findings;
c. proposed research questions which may be answered or raised by analysis of the data recovered from the project; and
d. An estimate of the time needed to complete the analysis of recovered cultural resource materials and prepare the Cultural Resources Report.

Verification: The project owner shall ensure that the designated cultural resources specialist prepares the proposed scope of work within ninety (90) days following completion of the data recovery and site mitigation work. Within seven (7) days after completion of the proposed scope of work, the project owner shall submit it to the CPM for review and written approval.

CUL-15 The project owner shall ensure that the designated cultural resources specialist prepares a Cultural Resources Report. The project owner shall submit the report to the CPM for review and written approval.

Protocol: The Cultural Resources Report shall include (but not be limited to) the following:

a. For all projects:

A description of pre-project literature search, surveys, and any testing activities; maps showing areas surveyed or tested; a description of any monitoring activities; maps of any areas monitored; and conclusions and recommendations.

b. For projects in which cultural resources were encountered, include the items specified under "a" and also provide:

Site and isolate records and maps; a description of testing for, and determinations of, significance and potential eligibility; and a discussion of the research questions answered or raised by the data from the project.

c. For projects regarding which cultural resources were recovered, include the items specified under "a" and "b" and also provide:

A description of the methods employed in the field and laboratory; a description (including drawings and/or photos) of recovered cultural materials; results and findings of any special analyses conducted on recovered cultural resource materials; an inventory list of recovered cultural resource materials; an interpretation of the site(s) with regard to the research design; and the name and location of the public repository receiving the recovered cultural resources for curation.

Verification: The project owner shall ensure that the designated cultural resources specialists completes the Cultural Resources Report within ninety (90) days following completion of the analysis of the recovered cultural materials. Within seven (7) days after completion of the report, the project owner shall submit the Cultural Resources Report to the CPM for review and written approval.

CUL-16 The project owner shall submit an original, an original-quality copy, and a computer disc copy of the CPM-approved Cultural Resource Report to the public repository to receive the recovered data and materials for curation (or other format to meet the repository's requirements), with copies to the State

Historic Preservation Officer (SHPO; to the Pit River tribe and affected tribal bands, to the Wintu tribe,), and to the appropriate regional archaeological information center(s). If the report is submitted to any of these entities on a computer disc, the disc files must meet SHPO requirements for format and content.

Protocol: The copies of the Cultural Resource Report to be sent to the curating repository, the SHPO and the regional information center(s), and the affected Native American tribes (Pit River and Wintu, as appropriate), shall include the following (based on the applicable scenario (a, b, or c) set forth in the previous condition):

a. originals or original-quality copies of all text;
b. originals of any topographic maps showing site and resource locations;
c. originals or original-quality copies of drawings of significant or diagnostic cultural resource materials found during pre-construction surveys or during project-related monitoring, data recovery, or mitigation; and
d. Photographs of the site(s) and the various cultural resource materials recovered during project monitoring and mitigation and subjected to post-recovery analysis and evaluation. The project owner shall provide the curating repository with a set of negatives for all of the photographs.

Verification: Within thirty (30) days after receiving approval of the Cultural Resources Report, the project owner shall provide to the CPM documentation that the report has been sent to the public repository receiving the recovered data and materials for curation, the SHPO, the concerned tribe(s), and the appropriate archaeological information center(s), and the affected Native American tribes.

For the life of the project the project owner shall maintain in its compliance files copies of all documentation related to the filing of the CPM-approved Cultural Resources Report with the public repository receiving the recovered data and materials for curation, the SHPO, the concerned tribe(s), and the appropriate archaeological information center(s).

CUL-17 Following the filing of the CPM-approved Cultural Resource Report with the appropriate entities, the project owner shall ensure that all cultural resource materials, maps and data collected during data recovery and mitigation for the project are delivered to a public repository that meets the US Secretary of Interior requirements for the curation of cultural resources. The project owner shall pay any fees for curation required by the repository.

Verification: The project owner shall ensure that all recovered cultural resource materials are delivered for curation within thirty (30) days after providing the CPM-approved Cultural Resource Report to the public repository receiving the recovered data and materials, to the SHPO, to the concerned tribe(s), and to the appropriate archaeological information center(s).

For the life of the project the project owner shall maintain in its project history or compliance files, copies of signed contracts or agreements with the public repository to which the project owner has delivered for curation all cultural resource materials collected during data recovery and mitigation for the project.

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SOCIOECONOMICS

Testimony of James Adams

INTRODUCTION

A staff socioeconomic impact analysis evaluates the project induced changes on community services and/or infrastructure such as schools, medical and protective services and related community issues such as environmental justice and facility closure. This analysis discusses the potential and cumulative impacts of the Three Mountain Power Project (TMPP) on local communities, resources and public services, pursuant to Title 14, California Code of Regulations, Section 15131.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

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

STATE

CALIFORNIA GOVERNMENT CODE, SECTION 65996-65997

As amended by SB 50 (Stats. 1998, ch. 407, sec. 23), states that public agencies may not impose fees, charges or other financial requirements to offset the cost for school facilities.

SETTING

The TMPP will be located about one-mile northeast of the town of Burney, and approximately 45 miles northeast of Redding. For a full description of the socioeconomic setting, please refer to the **Project Description** section of this document and the project description and location in the Three Mountain AFC, Vol. 1, March 1999. The study or affected area for this project, as defined in the AFC (Vol. 1, section 6.7.1.1) is Shasta County, but the research is focused on the town of Burney and its vicinity. The small town of Johnson Park is located nearby. Staff believes that the affected area for socioeconomics should include a greater area within Shasta County, including the city of Redding, 45 miles southwest of Burney, and Falls River, 20 miles northeast of Burney. Redding is expected to provide a

significant portion of the labor force and materials needed to construct the proposed power plant.

IMPACTS

Staff has reviewed the socioeconomic section in the TMPP AFC, Vol.1, Section 6.7, regarding potential impacts on community services and infrastructure (i.e. employment, housing, schools, utilities, emergency and other services), and environmental justice. Based on its independent analysis, and the data provided and referenced from government agencies and trade associations, staff finds the AFC's socioeconomic analysis and conclusions to be acceptable. Specifically, the TMPP will have a temporary socioeconomic benefit to the towns of Burney and Johnson Park in terms of an increase in a demand for services and a few local jobs will be generated during the construction of the facility. The construction payroll and project expenditures will also have a positive effect on the local and county economy. The operation of the facility will involve 20 to 25 full-time workers, the purchase of materials and supplies, and property tax revenues on an annual basis. TMPP will not adversely affect schools, medical services, water and natural gas supply, law enforcement, or housing. Staff has identified a potential significant impact on fire protection services.

EMPLOYMENT

The TMPP AFC anticipates that 75 percent of the 224-350 labor force needed for construction would be residents of other areas of the state or nation. This assessment was based on the experience of constructing the biomass plant in the mid-1980s. At the time that the AFC was written, a general contractor for the project had not been selected. A contractor has recently been hired, and they anticipate that 80 percent of the labor force will be available from within Shasta County (Toth 1999). The remaining 20 percent or 45 to 70 workers will either come from the San Francisco Bay or Sacramento area, the equipment manufacturers, or from a special "travelers" work force that move from one project site to another. A representative of Shasta Building Trades believes that virtually all of the laborers needed for TMPP are available in the greater Redding area (Dagg 1999). These estimates seem reasonable since Burney (population 3,423 in 1999) does not have an adequate labor pool for the project. Based on the information provided in Table 6.7-7 (AFC 1999, p.6.7-17), staff believes that the Redding area can supply the largest component of the necessary laborers who will probably commute to the site daily.

Project construction would take approximately two years and employment would peak during the 13th month of construction when almost 350 workers will be needed. An average of 224 workers will be needed for fourteen consecutive months beginning in the 7th month of construction. The transmission line reconductoring will be done by PG&E personnel and is scheduled to begin in the summer of 2000 and will be completed by the fall of 2001. It is anticipated that two crews will do the work with a combined workforce of 10 to 18 people (Hemstock 1999). The applicant anticipates that a few jobs will go to local Burney residents and staff has proposed a condition of certification to ensure that this occurs. In general,

job increases have a multiplier effect on the local and regional economy by supporting additional indirect job growth. It is generally accepted that two to three indirect jobs are supported by the addition of each new construction job, such as that created by the construction of the TMPP.

Given the decline in economic growth in the Burney area, in part because of the steady losses in the lumber and wood products industry, new economic stimulus would provide a much-needed boost for the local economy. Local businessmen have relayed to staff that over two dozen shops and businesses have left downtown Burney in the last few years (Graham 1999). After construction of the plant is complete, an additional 20 to 25 full-time workers will be needed to operate the facility. This will have a small but beneficial socioeconomic impact on the Burney area.

HOUSING

There were a total of 1,382 housing units in 1990, including 114 vacant units. In addition, there are a variety of temporary housing opportunities in the Burney area such as motels, campgrounds, trailer parks, bed and breakfasts, and short-term rentals of available houses. These temporary housing opportunities in Burney could handle a majority, if not all of the non-local workers involved with the construction of the power plant. For example, a Canadian gas pipeline was constructed in 1992 that employed as many as 1,000 workers. On average, 400 workers stayed in the Burney-Johnson Park-Falls River area. During the peak construction period, as many as 1,000 workers had local accommodations such as the motels and trailer parks mentioned above (Hendrickson 1999). Workers who commute weekly or decide to temporarily move from Redding to the Burney area, or those from outside Shasta County who move into the local area during the construction period, would be able to find similar accommodations.

SCHOOLS

As noted above, most workers employed in the construction phase of the project will commute and will not be relocating in the Burney area. Thus, there will be little if any impact on the local school district since families will not be enrolling their children in local schools. Indeed, in another example of the economic decline in the Burney area, approximately 300 children have left the Fall River school District in the last four years (Graham 1999). Any additional children added to the school district would have a positive impact since funding levels are related to enrollment figures (Mildrum 1999).

UTILITIES, EMERGENCY AND OTHER SERVICES

The Burney Water District is in the midst of expanding its storage and delivery capacity. Federal funds are being utilized for an Economic Development Administration (EDA) Project to, among other things, increase sustained flow capacity from 1500 to 2500 gallons-per-minute (GPM) for a two-hour duration. The increased flow rate will meet the Burney Fire Protection District's basic requirement and will encourage businesses to develop in the eastern part of Burney (Suppa 1999). The Burney Water District notified (Letter of October 5, 1999) TMPP that it should consider dry cooling as an alternative to decrease water demand. However, the District agreed to provide water service to the project if a number of conditions

were met including the construction of two wells and a two million gallon water storage tank. For further discussion of these issues, please refer to the Water Supply section of the Final Staff Assessment (FSA). The District believes the applicant should pay for all studies and activities related to the water requirements for the project.

Sewer and wastewater during construction will be handled onsite by portable chemical toilets, a water retention basin that services Burney Mountain Power, or may be removed with a vacuum truck hauler. Wastewater generated during normal operation is not expected to significantly impact the Burney sewer and wastewater treatment system (Suppa 1999).

PG&E supplies natural gas to Burney and surrounding areas and does not anticipate that the project will have any significant impact on the natural gas service in the area. The project site is located approximately 2500 feet from two major gas lines that transport gas from Canada to California. Lines 400 and 401 are 36 inches and 42 inches in diameter, respectively, with in-line pressure of 900 pounds per square inch. PG&E believes the applicant will build and own the connecting line from TMPP (Karkazis 1999).

The two fire departments that provide emergency services in the local area are the Burney Fire Protection District and the California Division of Forestry. The fire departments have identified an impact on their ability to provide fire fighting service at an adequate level. The Burney Fire District has advised staff that it needs additional equipment and hazardous materials training to ensure adequate service (Sullivan 1999). To ensure that this takes place, staff has proposed a condition of certification that will require the applicant to reach an agreement with the Burney Fire District to provide for specific equipment and training. In addition, the Burney Fire District will receive significant annual property tax revenues from the TMPP. The Burney Fire District has two ambulances and would continue to provide emergency services to the area.

Law enforcement service is provided by the Burney Station of the Shasta County Sheriff's Office. The station has 13 full-time staff and has a service territory of approximately 1600 square miles of northeastern Shasta County. The service ratios to population (AFC 1999, p. 6.7-11) for the Burney Substation and Shasta County, 759 and 522 respectively, are reasonable though the Burney figure is somewhat low. The TMPP is not expected to cause any law enforcement problems (Burnett 1999).

The local medical facilities include Mayers Memorial Hospital, Mayers Memorial Hospital Annex, and the adjacent Urgent Care Walk-in Clinic. Mayers Memorial, located in Falls River about 20 miles northeast of Burney, is a full service hospital with 122 beds, 22 of which are designated for acute care service. There are also two ambulances available for use at the hospital (Rowland 1999). The Mayers Annex in Burney is a 45-bed long-term care facility with an evening walk-in clinic (Mason 1999). The Urgent Care Clinic, located 25 miles southwest of Burney, has 4 exam rooms and provides outpatient and primary care (Tona 1999). In addition, there are two major hospitals in Redding that could provide support medical

services including helicopter evacuation capability. Mercy Medical and Redding Medical are full service hospitals with a combined capacity of over 400 beds (Rowland 1999). These facilities seem capable of handling any increased level of service that may be generated by the project.

FINANCIAL

The applicant estimates (AFC 1999, p. 6.7-12) that the construction payroll will total between $23.8 million and $27.2 million. The capital cost of the project is estimated at $250 million and approximately $2 to $4 million worth of materials would be purchased from Shasta County sources. In addition, there could be significant expenditures by construction workers on local services such as restaurants, motels, and retail stores. The operational budget includes an annual payroll of $1.5 million and project expenditures of $4 million per year. This spending will generate sales tax revenue for the local jurisdiction (approximately one percent for the county, and about 6.25 percent for the State, for a total of 7.25 percent). There has been some discussion about the possibility that the owner of TMPP would create a fund to replace wood stoves in residences and businesses in the Burney area as an air quality related mitigation measure. If this were to take place, and a considerable number of new stoves were installed (i.e. 500 -1,000), this could have a beneficial economic impact since the purchase and installation of these appliances would generate significant revenue plus additional jobs. About $2.5 million of property tax revenue would be generated annually assuming the assessed value of the power plant is $250 million and the tax rate is one percent. Socioeconomics Table 1 depicts the estimated distribution of the tax revenues generated by TMPP (Warsinger 1999).

ENVIRONMENTAL JUSTICE

The populations estimates listed on pages 6.7-5 and 6.7-6 of the AFC show that the vast majority of the population in the Burney area and Shasta County as a whole are white. This is consistent with staff's review of data from the California Department of Finance and the U.S. Census Bureau. Though the applicant did not discuss low-income populations, 1990 Census Bureau data show that the number of persons living in poverty is below twenty percent (See Socioeconomics Table 2 for minority populations in Burney and Shasta County). Approximately 5 percent of the population in the Burney area is non-white, and 6 percent is non-white in Shasta county. The TMPP is on and surrounded by ancestral lands of Pit River Native Americans. The Pit River tribe is composed of eleven "bands" that have lived in the local area for thousands of years.

The TMPP is on and surrounded by ancestral lands of Pit River Native Americans. The Pit River tribe is composed of eleven "bands" that have lived in the local area for thousands of years. Staff has contacted the Pit River Tribal Council, the Native American Heritage Commission, the Bureau of Indian Affairs, and the EPA to determine whether the TMPP will significantly impact the Pit River Native Americans. The nearest reservation is located in Burney approximately one mile southeast of the project site, and consists of a casino, health center, child care center and one or two residences which are on or near the reservation. There are a couple of Pit River members who live in Johnson Park approximately one mile north

SOCIOECONOMICS Table 1
Estimated Distribution of Property Tax Revenue from Three Mountain Power Plant

PROPOSED OGDEN GAS-FIRED 500MW FACILITY IN BURNEY

IF: THE PROPOSED FACILITY IS IN TAX RATE AREA 0770-049, AND

Assessed Value	$250,000,000
Tax Rate	1.0
Tax Revenue	$2,500,000

IF: THE PROPOSED FACILITY IS LOCALLY ASSESSED, THEN:

THE ESTIMATED DISTRIBUTION OF TAX REVENUES GENERATED BY THE PROPOSED FACILITY WOULD BE AS FOLLOWS:

	(1) AB8 ANNUAL TAX INCREMENT	AB8DISTRIBUTION	LESS ERAF SHIFT	AB8 NET TAX REVENUE
COUNTY GENERAL FUND	32.93699%	$ 823,426	$(405,662)	$417,764
SHASTA COUNTY WATER AGENCY	0.13459%	3,365	(326)	3,039
COUNTY SCHOOLS SERVICE FUND	3.3.625%	82,656	-0-	82,656
ST&T JUNIOR COLLEGE	7.68088%	192,022	-0-	192,022
FALL RIVER JOINT UNIFIED	40.63601%	1,015,900	- 0-	1,015,900
MAYERS MEMORIAL HOSPITAL	7.33289%	183,322	-0	183,322
BURNEY CEMETERY	1.41009%	35,252	(6,380)	28,872
BURNEY FIRE PROTECTION DISTRICT	1.65417%	41,354	(5,139)	36,215
BURNEY MOSQUITO ABATEMENT	4.90813%	122,703	(17,250)	105,453
ERAF SCHOOL SHIFT (2)	0.00000%	-	434,757	434,757

(1) In 1979, Assembly Bill 8 established a permanent formula for determining property tax revenue to be received by Local Agencies to schools for the 1979/1980 fiscal year and each year thereafter. AB8 also established a procedure for determining how growth in Local Assessed Value would be shared by Local Agencies and Schools.

(2) In 1992, Senate Bills 617, 844 and 1559 and Assembly Bill 3027 modified the AB8 formula to transfer funds from Local Agencies to Schools. These changes required a complicated formula, for each county, that removed 1992/93 fiscal year property tax revenue from most local agencies and deposited that revenue into an Educational Revenue Augmentation Fund (ERAF). The ERAF is distributed to School Entities. In 1993, Senate Bills 1135 and 837 and Assembly Bills 1519, 557, and 2371 provided additional transfer of property tax revenues from Local Agencies to the ERAF for distribution to Schools.

Source: Nancy Warsinger, Supervising Accountant, Auditor-Controller's Office, County of Shasta

Socioeconomics Table 2
Demographic Profile for Burney and Shasta County

Burney		Shasta County	
White	3250	White	139,977
Black	5	Black	1081
American Indian, Eskimo or Aleut	113	American Indian, Eskimo or Aleut	3885
Asian or Pacific Islander	16	Asian or Pacific Islander	2684
Other Race	39	Other Race	1340
Source: 1990 US Census Data. Statistical Information on population			

of the project site (Carmony 1999). The negotiations between the applicant and Pit River bands regarding archaelogical surveys and employment are ongoing and will be updated during Committee hearings on the TMPP. The construction and operation of TMPP is not expected to have a disproportionately high and adverse impact on the Pit River tribal members.

Air pollutant emissions from the project may affect areas within the Burney basin depending on prevailing winds, dispersal patterns and seasonal changes in meteorological conditions. The plant will be visible to a relatively small number of residences north of the facility though the plume may be visible by others at certain times of the year. There are residences and other sensitive receptors within a 2-mile radius that will experience noise impacts from the construction and operation of the TMPP. Public health impacts would be less than significant for any segment of the population. For more in-depth information, please see the appropriate technical sections elsewhere in the FSA.

Staff visited the Burney area several times and talked with individuals about the presence of minority and low-income populations (Carmony, Ranslow 1999). The results of these discussions can be summarized as follows: the makeup of the general population is heterogeneous in nature without a concentration of a minority, low-income or Native American population in any specific location. Based on this fact plus the small percentage of minority, low-income, or Native American population within the affected area, and the potential impacts mentioned above are not significant, staff believes there are no environmental justice issues concerning the TMPP.

CUMULATIVE IMPACTS

The applicant has identified three projects in the Burney area that are undergoing or have undergone CEQA review of their applications. One has been approved. These include the expansion of the Burney Water District's water storage capacity, a residential development along Black Ranch Road, and a commercial development project that would be located northeast of the TMPP. The first project is underway. Staff believes that, at the present time, the second project is likely to be modified or stopped because of environmental constraints, general plan inconsistencies and public opposition. The third project is approved but construction has not yet started. It may be delayed indefinitely and could be built in phases (Kaminski 1999*)*. The Burney Water District expansion is expected to be completed by the summer of 2000.

Based on the information contained in the AFC and staffs' independent analysis, there will be no adverse cumulative socioeconomic impacts from the TMPP. Some local laborers will be part of the construction and operation of the facility. The influx of workers to the Burney area will have a beneficial impact on the local economy. Housing, medical services and schools will not be adversely impacted. Assuming that the deliberations between the applicant and the water and fire districts are resolved satisfactorily to all parties, fire and water services to the Burney area will not be adversely affected. Property tax revenues from the project will benefit school, fire and other districts in the Burney area and Shasta County.

In summary, staff believes that the construction and operation of the TMPP will not have significant cumulative impacts on the local area.

FACILITY CLOSURE

PLANNED CLOSURE

The TMPP AFC (pgs. 4-1 and 4-2) describes what will happen if the plant is shutdown or closed prematurely. The planned lifetime of the proposed power plant is 35 years; however, given unforeseen circumstances the plant may be retired prematurely for a variety of reasons. This could include the determination that the plant is no longer economically viable.

UNEXPECTED TEMPORARY CLOSURE

Should the plant be temporarily shutdown or closed, there would not be any significant socioeconomic impacts. The applicant would conduct a review to determine if there had been any environmental damage or release of hazardous materials. If not, the plant could be mothballed. Before the plant begins commercial operation, the applicant will develop a contingency plan to deal with premature or unexpected closures. This would include communication with the Energy Commission, Shasta County, and local agencies regarding schedule of Facility closure and compliance with LORS.

UNEXPECTED PERMANENT CLOSURE

In the event that the decision is made to permanently close the facility, the applicant will develop a plan for decommissioning that will be submitted to the Energy Commission and other appropriate agencies. The plan will include compliance with all applicable LORS. Should the plant be permanently closed, the beneficial socioeconomic impacts such as worker payroll, project expenditures, local economic stimulus, and property tax revenues would no longer occur.

MITIGATION

Energy Commission staff has identified economic and fiscal benefits to the project area such as employment, project expenditures, and property tax revenues. To ensure that the local area benefits from the project, staff is proposing a condition of certification that will lead to local employment and project-related expenditures. An additional condition is proposed to provide for project-related equipment and training needs for the Burney Fire District. In written comments on the PSA, the applicant asserted that the condition (SOCIO-2) could be construed to require an agreement with Shasta County and/or the Burney Fire District at any cost to TMPP. The applicant proposed some alternate language.

SOCIO-2 requires the project owner to work out an agreement with the Fire District and Shasta County to fund the purchase of a used ladder truck, three Macaw backpacks, and pay for the costs of training fire personnel on the use of the truck and dealing with hazardous materials. Socio-2 has been modified to identify the equipment and training outlined in a November 22, 1999 letter from Fire Chief Larry Sullivan. Staff and Chief Larry Sullivan intend that the applicant be reimbursed for a portion of the cost of the ladder truck by other local industries, and/or credited for a portion of future taxes which would be allocated to the Burney Fire District up to an amount agreed to by the applicant, the Burney Fire District and Shasta County. The intent is for the applicant to pay for a fair share of the cost to purchase a used fire truck. Staff is encouraging the Fire Chief to contact representatives from other local industries to elicit financial commitments to pay for the equipment and training.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff believes that the TMPP is not expected to cause a significant adverse direct or cumulative impact on housing, employment, schools, utilities, emergency and other services. Because there is no significant adverse impact on minority, low-income and Pit River populations, there is no environmental justice issue.

The estimated benefits from the project include increases in the affected area's property and sales taxes, employment, and sales of services, manufactured goods and equipment. As discussed above, an average of 224 workers will be employed for fourteen months during the construction of the facility. The construction payroll will total between $23.8 million and $27.2 million. Property tax revenue will be

approximately $2.5 million annually during operation of the TMPP. The operational payroll will be approximately $1.5 million per year and an estimated $4 million worth of materials will be purchased annually in Shasta County. The project will have a positive socioeconomic impact on the Burney area.

The project, as proposed, is consistent with all applicable socioeconomic laws, ordinances, regulations and standards.

RECOMMENDATIONS

If the Energy Commission certifies the proposed project, staff recommends that it adopt the following conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner and its contractors and subcontractors shall recruit employees, including members of the PIT River Tribe when appropriate, and procure materials and supplies within the Burney area and Shasta County first, and other counties second unless:

- to do so will violate federal and/or state statutes;
- the materials and/or supplies are not available; or
- qualified employees for specific jobs or positions are not available; or
- there is a reasonable basis to hire someone for a specific position for outside the local area.

Verification: At least 60 days prior to the start of construction, the project owner shall submit to the Energy Commission Compliance Project Manager (CPM) copies of contractor, subcontractor, and vendor solicitations and guidelines stating hiring and procurement requirements and procedures. In addition, the project owner shall notify the CPM in each Monthly Compliance Report of the reasons for any planned procurement of materials or hiring outside the local regional area that will occur during the next two months.

SOCIO-2 Prior to the start of construction, the project owner shall reach agreement with Shasta County and the Burney Fire District on the amount and timing of funds the project owner will provide to cover the following equipment and training associated with hazardous materials handling and fire protection:

- One (1) used ladder truck with 100 foot platform
- Training for Fire Department personnel on ladder truck
- Training for Department personnel on hazardous materials
- Three Macaw backpacks

Verification: At least 60 days prior to the start of construction, the project owner shall submit to the CPM a copy of the agreement with the Burney Fire District which states the amount and timing of funds the project owner will provide to cover project-specific impacts associated with hazardous materials handling and fire protection.

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BIOLOGICAL RESOURCES

Testimony by Linda Spiegel

INTRODUCTION

This section provides the Energy Commission staff's analysis of potential impacts to biological resources from the construction and operation of the Three Mountain Power Project (TMPP) proposed by Three Mountain Power, Limited Liability Company (the applicant). This analysis addresses potential impacts to state and federally listed species, species of special concern, and areas of critical biological concern; describes the biological resources of the project site and at the locations of appurtenant facilities; determines the need for mitigation and the adequacy of mitigation proposed by the applicant, and; where necessary, specifies additional mitigation measures to reduce identified impacts to less than significant levels. It also determines compliance with applicable laws, ordinances, regulations and standards (LORS), and recommends conditions of certification.

This analysis is based, in part, upon information provided in the applicant's Application for Certification (AFC) (TMP 1999a), Supplemental Filings (TMP 1999b), site visits, workshops, staff data requests and applicant responses (TMP 1999c - h), and discussions with various agency representatives.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL

ENDANGERED SPECIES ACT OF 1973

Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.

MIGRATORY BIRD TREATY ACT

Title 16, United States Code, sections 703 - 712, prohibits the take of migratory birds.

BALD EAGLE PROTECTION ACT

Title 16 United States Code, section 668, prohibits take and transport of bald and golden eagles.

CLEAN WATER ACT

Title 33, section 1344 et seq, prohibits the discharge of dredge or fill activities within waters of the U.S. without a Section 404 permit. Section 401 et seq, requires water quality assessment when using 404 permits and for discharges into waters of the U.S.

STATE

CALIFORNIA ENDANGERED SPECIES ACT OF 1984

Fish and Game Code sections 2050 et seq. protects California's rare, threatened, and endangered species.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

California Environmental Quality Act Guidelines Title 14, sections 15000, et. seq.

NEST OR EGGS – TAKE, POSSESS, OR DESTROY

Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs or any bird.

BIRDS OF PREY OR EGGS – TAKE, POSSESS, OR DESTROY

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

MIGRATORY BIRDS – TAKE OR POSSESSION

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

FULLY PROTECTED SPECIES

Fish and Game Code sections 3511, 4700, 5050, and 5515 prohibits take of animals that are classified as Fully Protected in California.

SIGNIFICANT NATURAL AREAS

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

STREAMBED ALTERATION AGREEMENT

Fish and Game Code section 1600 et seq. requires California Department of Fish and Game to review project impacts to waterways, including impacts to vegetation and wildlife from sediment, diversions and other disturbances.

NATIVE PLANT PROTECTION ACT OF 1977

Fish and Game Code section 1900 et seq. designates state rare, threatened, and endangered plants.

CALIFORNIA CODE OF REGULATIONS

Title 14, sections 670.2 and 670.5 list animals of California designated as threatened or endangered.

LOCAL

SHASTA COUNTY GENERAL PLAN

Fish and Wildlife Element sections 65302[d] and 65560, requires proposed projects to demonstrate a high degree of compatibility with any listed species habitat it may affect and designates critical deer wintering areas which provide protection for deer herds.

SETTING

REGIONAL DESCRIPTION

The proposed project site is located in the Burney Valley, in northeastern Shasta County, approximately 45 miles east of Redding and one mile northeast of Burney. The plant site, switchyard, transmission tie-in line, natural gas pipeline, water pipeline routes, and percolation ponds are located between the towns of Burney and Johnson Park. The project will require reconductoring of two existing 230 kV transmission lines for a distance of about 60 linear miles: 19 miles from the new transmission line tie-in to the Round Mountain Substation; 9 miles to the Pit 3 Substation; and, 32 miles from the Round Mountain Substation to the Cottonwood Substation, located south of the city of Anderson. The project description in the AFC states that 88 miles of transmission line will be reconductored; however, that accounts for 28 miles of a double circuit line (counted as 56 miles) and 32 miles of a single circuit for a total linear distance of 60 miles.

The project is located in the Cascade Range. Biotic communities in Burney Valley include ponderosa pine forest, volcanic talus, freshwater marsh, montane chaparral, and annual grasslands. The area is surrounded by volcanic cinder cones and mountains (TMP 1999a, Figure 6.13-1). Lake Britton, Burney Falls, and the Pit River are located approximately 5 miles to the north. The Burney watershed consists predominately of volcanic rocks from relatively young, highly fractured volcanic flows. This volcanic parent material creates highly permeable soils. The Burney aquifer is also composed of these fractured lava flows and is recharged solely through precipitation which rapidly percolates to the aquifer system with little or no filtration. The aquifer system is regionally unconfined and the quantity of groundwater stored in the fractures is limited. Therefore, the aquifer is susceptible to rapid declines in groundwater levels during drought conditions and is vulnerable to contamination from unfiltered sources.

The applicant provided lists of sensitive plant and animal species potentially occurring within the site and vicinity (TMP 1999a, Table 6.13-1 and Appendix I, Table 4-1, Table 4-2; TMP 1999b, Table 2-1). In a letter dated January 11, 2000 (Ellis 2000), Dr. Ellis, an aquatic ecologist who specializes in rare species, provided a list of endemic, sensitive species that could occur in the project area (Biological Resources Table 1). Each of these species is aquatic-dependent or aquatic - associated and occurs in or near springs, streams, or rivers. The area also

supports the Pit River strain of rainbow trout, one of the few remaining wild or pure strains of trout in the state (Cook 2000).

BIOLOGICAL RESOURCES Table 1
Special Status Species of Terrestrial and Aquatic Molluscs, Amphibians, and Reptiles Known or Potentially Occurring in the Burney Watershed Area

Common Name	Scientific Name	Status[1]	Potential/Area
Terrestrial Molluscs			
Oregon shoulderband snail	*Helminthoglypta herleini*	ROD S&M	Springs less than 1 cfs
Klamath shoulderband snail	*Helminthoglypta talmadgei*	ROD S&M	Springs less than 1 cfs
Siskiyou sideband snail	*Monadenia chaceana*	ROD S&M	Springs less than 1 cfs
Church's sideband snail	*Monadenia churchi*	ROD S&M	Springs less than 1 cfs
Shasta sideband snail	*Monadenia troglodytes trogoldytes*	FSC, ROD S&M	Springs less than 1 cfs
Wintu sideband snail	*Mondenia troglodytes wintu*	FSC, ROD S&M	Springs less than 1 cfs
Shasta chaparral snail	*Trilobopsis roperi*	ROD S&M	Springs less than 1 cfs
Tehama chaparral snail	*Trilobopsis tehamana*	ROD S&M	Springs less than 1 cfs
Pressley Hesparian snail	*Vespericola pressleyi*	ROD S&M	Springs less than 1 cfs
Shasta Hesparian snail	*Vespericola shasta*	ROD S&M	Springs less than 1 cfs
Papilose tail-dropper slug	*Prophysan dubium*	ROD S&M	Springs less than 1 cfs
Aquatic Molluscs			
Potem pebblesnail	*Fluminicola n. sp.*	ROD S&M	River proper & margins
Flat-top pebblesnail	*Fluminicola n. sp*	ROD S&M	River proper & margins
Shasta springs pebblesnail	*Fluminicola n. sp*	ROD S&M	River proper & margins
Disjunct pebblesnail	*Fluminicola n. sp*	ROD S&M	River proper & margins
Globular Pebblesnail	*Fluminicola n. sp*	ROD S&M	River proper & margins
Umbilicate pebblesnail	*Fluminicola n. sp*	ROD S&M	River proper & margins
Lost Creek pebblesnail	*Fluminicola n. sp*	ROD S&M	River proper & margins
Nugget pebblesnail	*Fluminicola seminalis*	ROD S&M	River proper & margins
Scalloped juga snail	*Juga occata*	FSS	River proper & margins
Topaz Juga	*Juga acutifilosa*	FSS	River proper & margins
Cinnamon juga snail	*Juga n. sp*	ROD S&M	River proper & margins
Canary duskysnail	*Lyogyrus n. sp*	ROD S&M	River proper & margins
Knobby rams-horm snail	*Vorticifex n. sp.*	ROD S&M	River proper & margins
Great Basin rams-horn	*Helisoma newberryi newberryi*	FSS	River proper & margins
California floater mussel	*Anodonta californiensis*	FSC. FSS	Lake Britton & River proper
Montane peaclam	*Pisiduim ultramontanum*	FSC, FSS	River proper & margins
Ampbibians			
Shasta salamander	*Hydromantes shastae*	CT	
Fpothill yellow-legged frog	*Rana boylii*	FSC, FSS. CSC	River
Cascade frog	*Rana cascade*	FSC. FSS. CSC	River proper & margins
Northern leopard frog	*Rana pipiens*	FSS, CSC	River proper & margins
Spotted frog	*Rana pretiosa*	FSS, CSC	River proper & margins
Reptiles			
Northwestern pond turtle	*Clemmys marmorata marmorata*	FSS, CSC	Ponds & streams

[1] ROD S&M:U.S. Forest Service Record of Decision C-3 Survey and Manage Species
FSC: Federal Species of Concern
FSS: U.S. Forest Service Sensitive
CT: California State Threatened
CSC: California Species of Special Concern

SITE VICINITY

The power plant, switchyard, percolation ponds, and gas and water pipeline routes are located within ponderosa pine forest habitat (TMP 1999a, Figure 6.13-1). The power plant site proper is disturbed by current activities associated with a 10 MW biomass power plant. Wildlife use around the site would be minimal and include black-tailed mule deer, common raven, coyote, hares, and various raptors including red-tailed hawk, northern harrier, cooper's hawk, and American kestrel.

POWER PLANT SITE, LAYDOWN, AND SWITCHYARD

The power plant will occupy 10.2 acres of an existing disturbed 40-acre site, zoned for general industrial use. A portion of the site is occupied by the 10 MW Burney Mountain Power biomass plant. The laydown area and switchyard will be located on compacted soil within the 40-acre site. The access road is existing.

NATURAL GAS PIPELINE

There are three alternative gas pipeline routes. The preferred route, Alternative A, follows the access road from the plant site to Highway 299 for about 670 feet and travels east through ponderosa pine habitat for the remaining 2,230 feet. Alternative B follows a dirt road south from the southwest end of the parcel about 1,070 feet to Highway 299, travels approximately 1,200 feet through ponderosa pine habitat, then follows another dirt road east for about 1,730 feet to the pumping station. Alternative C follows the access road to Highway 299 for about 670 feet, follows Highway 299 south for about 4,000 feet, turns east into ponderosa pine habitat for about 1,700 feet and follows the same dirt road as Alternative B for about 1,730 feet. Each alternative has a 3-acre laydown area on each end that will be located in disturbed areas (1999c, Response to Data Request #2, page 3).

WATER SUPPLY LINE

The water supply line travels from the southwest end of the site along the same dirt road as the gas line alternative B to Highway 299 (1070 feet), then south - southeast through ponderosa pine habitat for about 4,210 feet to the Burney Water District storage facility.

WASTE WATER DISPOSAL LINE AND PERCOLATION PONDS

Three discharge percolation ponds will be located west of the plant site and railroad track in ponderosa pine habitat. Approximately 6 acres will be required (TMP 1999g, Response to Data Request #65; Draft Erosion Control and Stormwater Management Plan, page 1). Staff believes 5 acres will be required for the ponds (TMP 1999c, Response to Data Request #2) and 1 acre for a 12 X 50-foot wide berm (1999g). Pipeline routes from the power plant to the ponds have not been discussed by the applicant. Therefore, it is unclear if this pipeline is included in the 6 acre estimate of habitat disturbance. Storm water will be stored in a 15 x 200-foot depression at the northwest corner of the plant and will be discharged from a pipe into the existing railroad right-of-way (TMP 1999g, Response to Data Request #65; Draft Erosion Control and Stormwater Management Plan, page 2).

TRANSMISSION LINES

A new transmission line will be built from the power plant to an existing PG&E 230 kV line to the north. The new line begins at a 2-acre switchyard site located at the northeast corner of the property. The switchyard site is disturbed. The line runs through ponderosa pine habitat along the northern boundary of the property for 800 feet, then turns north and follows an existing railroad right-of-way and a 60 kV distribution line adjacent to ponderosa pine habitat for 1,800 feet.

Approximately 60 miles of an existing 230 kV line will be reconductored. From the power plant site the line travels west about 5 miles then splits north for 9 miles to the Pit 3 Substation and west 14 miles to the Round Mountain Substation. From Round Mountain, the line runs south for 32 miles to the Cottonwood Substation. The 230 kV transmission line transverses several habitat types. The right of way is periodically cleared by PG&E and consists mostly of chaparral, small trees, and grassland. Primary habitats from the plant site to the Round Mountain substation are mixed coniferous forest, montane chaparral, wet montane meadows, and burned ponderosa pine forest (TMP 1999b, Figures 1 – 31). Primary habitats from the Round Mountain substation to the Cottonwood substation include burned and unburned ponderosa pine forest, chaparral, grassland, blue oak – foothill pine woodland, mixed evergreen forest, wet meadow, northern volcanic vernal pools, and valley oak riparian (TMP 1999b, Figures 31 – 85). Primary habitats along the spur to Pit 3 substation include ponderosa pine forest, wet meadow, chaparral, and mixed coniferous forest (TMP 1999b, Figures 86 – 97). The transmission line route crosses 2 rivers and 14 creeks (TMP 1999b, Figure 6.13-4; Appendix I-2, page 1-2-1). Approximately 4.25 miles of the transmission line cross (TMP 1999b, Figures 99, 100, 104) Shasta National Forest lands (TMP 1999b, Figures 99, 100, 102, 103, and 104; Figures 99, 100, and 104 show it as Lassen National Forest).

Portions of the line cross critical deer wintering range (TMP 1999a, Figure 6.13-5; TMP 1999b, Figure 2.1). Several raptor species are likely to inhabit the surrounding areas. Osprey, golden eagle, bald eagle, red-tailed hawk, great-horned owl, and common raven nests can occur on the towers. A complete list of sensitive species known to occur in the vicinity of the transmission line corridor were provided by the applicant (TMP 1999b, Appendix I-2, Tables 2-1, 2-2, and 2-3). Species observed and/or with the highest potential to occur along the corridor are provided in Biological Resources Tables 2 and 3.

IMPACTS

PROJECT SPECIFIC DIRECT AND INDIRECT IMPACTS

Potential impacts to biological resources from the construction, operation, and maintenance activities of the proposed project include:

- Permanent loss of habitat from the project footprints and access roads
- Temporary loss of habitat from construction of the linear facilities
- Habitat degradation from power plant emissions and water use

- Displacement of wildlife during construction activities
- Disturbance to nesting raptors
- Bird collisions with transmission lines

POWER PLANT SITE AND NEW LINEAR FACILITIES

PERMANENT AND TEMPORARY LOSS OF HABITAT

The proposed project will result in the direct permanent loss of habitat from the footprints of the project components and direct temporary loss from construction activities. The applicant has provided several different estimates of the acres of natural habitat that will be lost due to construction (TMP 1999a, TMP 1999b, TMP 1999c, TMP 1999e, TMP1999g). At a workshop on November 3, 1999 the applicant stated that the information provided in TMP 1999c (Response to Data Request #2) was the correct estimates. Biological Resources Table 4 provides a summary of those estimates. The applicant proposes to re-vegetate areas disturbed with a grassland mixture and to remove any re-growth of brush and trees. Therefore, impacts to ponderosa pine habitat are considered permanent and impacts to grassland habitat are considered temporary.

The applicant's preferred gas pipeline route is alternative A. Under this alternative, the project will result in the permanent loss of 24.78 acres of ponderosa pine habitat and temporary loss of 0.77 acres of grassland habitat.

POWER PLANT EMISSIONS AND WATER USE

Water for the cooling towers will be supplied by two new wells located south of the site. Presently, it is uncertain if these wells will be operated by Burney Water District (BWD) or the applicant (Toth Pers. Comm.2000). The proposed facility will require 3,500 acre-feet of water per year and will discharge 760 acre-feet per year for a net consumptive use of 2,800 acre-feet of water per year. Ground water resource evaluations of the Burney area watershed performed in 1988 by CH2M Hill and in 1999 by Lawrence and Associates were verified by SHN Consulting Engineers and Geologists, Inc in November 1999 (CH2M Hill 1988, TMP 1999a, Appendix J, SHN 1999). Lawrence and Associates concluded that the Burney groundwater basin receives approximately 169,000 acre-feet per year of recharge, 20,000 acre feet per year is lost to consumptive use, and 149,000 acre-feet per year discharges from the basin primarily via Burney Falls and Burney Creek. Based on this information, and with concurrence from SHN, the proposed facility will represent a 13 percent increase in consumptive use and a two percent decrease in the natural discharge from the basin (SHN 1999).

These evaluations did not include an analysis of drought conditions. Precipitation is the source of recharge to the aquifer and research shows periods of drought correspond to periods of low groundwater levels (see CEC 1999, Soil and Water Resources) and concomitant decreases of flows in local springs (Rose and Davission 1997, Ellis per comm 2000b). The aquifer is complex. Groundwater

BIOLOGICAL RESOURCES Table 2
Sensitive Plant Species – Potential Occurrence Along Transmission Line Corridor

Common Name	Scientific Name	Status[1] Fed/State/CNPS	Potential/Area
Boggs Lake hedge-hyssop	*Gratiola heterosepala*	--/E/1B	Moderate. seasonal wetlands n. of Panorama Point Rd & in vernal pool on access roads on plains e. of Oak Run Rd
Slender Orcutt grass	*Orcuttia tenuis*	T/E/1B	Moderate. Vernal pools just n.of Panorama Point Rd, on access roads on plains e. of Oak Run Rd, n. of Burney on w. edge of Goose Valley.
Silky cryptantha	*Cryptantha crinita*	SC/--/1B	Present. Reported at Balls Ferry. Could also occur in streams between Sac River, plains s. of Oak Run, drainages s. of Panorama Point Rd and n. of Cottonwood Substation.
Woolly meadow foam	*Limnanthes floccosa* spp. *floccosa*	--/--/1B	Present. Found in overflow channel of Dry Cr, s. of Dersch Rd. Potential in wet swales and at edges of meadows from n. Sac River to plains e. of Oak Run Rd.
Ahart's paronychia	*Paronychia ahartii*	SC/--/1B	High. Barren edges of swales and vernal pools, mainly in Millville Plains and on plains n. of Sac R.
Butte County fritillary	*Fritillaria eastwoodiae*	SC/--/1B	High. Oak Woodlands & coniferous forest on slopes between Whtmore & Oak Run.
Red Bluff dwarf rush	*Juncus leiospermus* var. *leiospermus*	--/--/1B	Present. Found n. of Sac River. Potential in swales and pools on plains between Sac River & Oak Run & ne of Burney on edge of Goose Valley.
Legenere	*Legenere limosa*	SC/--/1B	Moderate. Wetlands n. of Panorama Point Rd, low potential in vernal pools on plains e. of Oak Run.
Profuse-flowered pogogyne	*Pogogyne floribunda*	--/--/1B	Moderate. Vernal pool n. of Burney in e. Goose Valley.
Long-leaved starwort	*Stellaria longifolia*	--/--/2	Moderate. Vernal pool n. of Burney in e. Goose Valley.
Fox sedge	*Carex vulpinoidea*	--/--/2	Moderate. Wetlands & marshes n. of Panorama Point Rd & n. of Kimberly Rd. to Sac River.
Pointed broom sedge	*Carex scoparia*	--/--/2	Present. Known to occur in wetlands & marshes n. of Panorama Point Rd. Moderate in wetlands n. of Kimberly Rd to Sac River.
Long-haired star tulip	*Calochortus longibarbatus* var. *longibarbatus*	SC/--/1B	Moderate. Vernal pool n. of Burney on e. edge of Goose Valley.
Shasta Clarkia	*Clarkia borealis* ssp. *arida*	SC/--/4	Moderate. N. & s. of Highway 44

[1]Federal Status
- E-Endangered
- T-Threatened
- SC- Species of Special Concern

State Status
- E-Endangered
- T-Threatened
- CSC-California Species of Special Concern

California Native Plant Society (CNPS)
- 1B-Rare, threatened, or endangered in California and elsewhere
- List 2-Rare, threatened, or endangered in California, more common elsewhere
- 4-limited distribution – A watch list

BIOLOGICAL RESOURCES Table 3
Sensitive Wildlife Species – Potential Occurrence Along Transmission Line Corridor

Common Name	Scientific Name	Status[1] Fed/State	Potential/Area
Vernal pool fairy shrimp	*Branchinecta lynchi*	T/--	Moderate. Stillwater Plains to west in vernal pools.
Vernal pool tadpole shrimp	*Lepidurus packardi*	E/--	Moderate. Stillwater Plains to west in vernal pools.
Shasta crayfish	*Pacifastacus fortis*	E/E	Present .Pit River. High in streams.
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	T/--	Moderate. Elderberries e. bank of Sac River
Central Valley steelhead	*Oncorhynchus mykiss*	PE/--	High. Streams
Chinook salmon-winter run	*Oncorhynchus tshawytscha*	E/E	Moderate. Sac River
Hardhead	*Mylopharadon conocephalus*	--/CSC	Present. Pit River. Streams
Bigesye marbled sculpin	*Cottus klamathensis macrops*	--/CSC	Present. Pit 4 Reservoir
Western spadefoot toad	*Scaphiopus hammondii*	SC/CSC	Unknown. Potential in shallow pools.
Foothill yellow-legged frog	*Rana boylii*	SC/CSC	Moderate. Streams
Northwestern pond turtle	*Clemmys marmorata marmorata*	SC/CSC	High. Ponds and streams.
American bittern	*Botaurus lentiginosus*	MNBMC/--	Moderate. Marshes from Panorama Point to Balls Ferry
Osprey	*Pandion haliaetus*	SC/Sensitive	Present. Nests on towers.
White-tailed kite	*Elanus leucurus*	MNBMC/Protected	Moderate. Foothill grasslands and riparian habitats.
Bald eagle	*Haliaetus leucocephalus*	T/E	Present. Forests and waters.
Northern harrier	*Circus cyaneus*	--/CSC	High. Variety of habitat types.
Sharp-shinned hawk	*Accipiter striatus*	--/CSC	High. Coniferous forest, mixed woodlands.
Cooper's hawk	*Accipiter cooperii*	--/CSC	High. Mixed woodlands and streamside groves.
Northern goshawk	*Accipiter gentilis*	SC/CSC	High. Coniferous dominated mixed forest.
Golden eagle	*Aquila chrysaetos*	SC/Protected	Moderate. Ledges, large trees, open areas.
Merlin	*Falco columbarius*	--/CSC	High. Open habitats in winter.
Long-eared owl	*Asio otus*	--/CSC	Moderate. Wooded habitats.
Spotted owl	*Strix occidentalis*	T/CSC	Present. Wooded habitats.
Vaux's swift	*Chaetura vauxi*	--/CSC	High. Open forest, from Round Mtn to Pit River.
Olive-sided flycatcher	*Contopus cooperi*	MNBMC/--	Present. Coniferous forest.
Purple martin	*Progne subis*	--/CSC	Present. Burned forest s. Goose Crk
Bank swallow	*Riparia riparia*	--/T	Present. Vertical banks near water.
Loggerhead shrike	*Lanius ludoviciana*	SC/CSC	High. Forest, Oak, Riparian woodlands, grasslands.
Yellow warbler	*Dendroica occidentails*	--/CSC	Moderate. Riparian, chaparral, montane coniferous.
Hermit warbler	*Dendroica occidentails*	MNBMC/--	Present. Mixed conifer forest.
Yellow-breasted chat	*Icteria virens*	--/CSC	High. Riparian, young chaparral.
Grasshopper sparrow	*Ammodramus savannarum*	MNBMC/--	Moderate. Grasslands
Tricolored blackbird	*Aegelaius tricolor*	SC/CSC	Moderate. Marsh w/cattails or bulrushes occasionally other dense shrubs e.g. willows
Pallid bat	*Antrozous pallidus*	--/CSC	High. Oak run to Round Mtn.
Fringed myotis	*Myotis thysanodes*	SC/--	High. Roosts in caves, bridges.
Long-legged myotis	*Myotis volans*	SC/--	High. Round Mtn to Pit River Woodland, forests >4000ft.
Yuma myotis	*Myotis yummanensis*	SC/CSC	High. Open forests and woodlands near water.
Marysville kangaroo rat	*Dipodomys californicus eximus*	SC/CSC	High. Grasslands Cottonwood to Millville Plains.

[1]Federal Status
- E-Endangered
- T-Threatened
- SC- Species of Special Concern
- MNBMC-USFWS Migratory Nongame Bird of Management Concern

State Status
- E-Endangered
- T-Threatened
- CSC-California Species of Special Concern

BIOLOGICAL RESOURCES Table 4
Permanent and Temporary Habitat Disturbance (acres) from the Project

Facility	Area Required	Existing Disturbed	Permanent Ponderosa Pine	Temporary Grassland
Power Plant/laydown	10.2	9.2	1	
Water Supply	14.09	0	2.7	0.64
Percolation Ponds	6		6	
New T-Line	17.9	6	11.9	
Switchyard	2	2		
Linear laydown	18	18		
Gas Supply				
Alternative A	3.91	0.6	3.18	0.13
Alternative B	5.14	1.84	2.7	0.6
Alternative C	10.5	7.02	3.39	0.09
Totals:				
Alternative A	**72.1**	**35.80**	**24.78**	**0.77**
Alternative B	73.33	40.11	31.98	1.24
Alternative C	78.69	45.29	32.67	0.73

occurs and flows through preferential pathways such as fracture and fault zones. There is a high level of interconnectivity in the larger regional groundwater system and stored groundwater is limited. However, several properties, such as storage capacity, hydraulic conductivity, and porosity, are unknown. Also, the relationships and rates of discharge between the aquifer and the springs and creeks are not well understood**.**In the absence of this information, the effects of drawing groundwater for the facility during periods of prolonged drought as occurred in the area from 1987- 1992 are unknown. During that drought period, however, flows to two large springs that were monitored in the Hat Creek area, which includes the Burney basin aquifer, were reduced by 50% and numerous smaller springs (less than 1 cubic-foot per second) dried (Ellis pers comm 2000a). Inspection of gage data for the Hat Creek No. 1 and 2 Powerhouses, which are run-of-the-river facilities whose primary sources of water are large springs of the same aquifer, show that these facilities both experienced a reduction of flow of approximately 30% as a result of the 1987-1992 drought (Cook pers comm.2000b).

The sensitive resources listed in Biological Resources Table 1 are dependent on the springs, streams or rivers in the area. Most of these are endemic to the local area. Six are federal species of concern, five are state species of special concern, nine are U.S. Forest Service sensitive species, and twenty-two are U.S. Forest Service Record of Decision C-3 Survey and Manage Species (ROM S&M). The Northwest Forest Plan includes measures to protect these species and the Standards and Guidelines (Attachment A of the Northwest Forest Plan) require identification, mapping, and management of known sites. The Northwest Forest Plan applies to Forest Service and Bureau of Land Management Lands. Because the species list was brought to the attention of staff and the applicant after the development of the PSA, surveys for these species have not been conducted. However, six are known to occur in the area and there is a high potential for the others to occur in the area (Ellis pers comm 2000b). Although the proposed plant site and new linear facilities are not located on US Forest or BLM lands proper, the

aquifer that will supply the power plant also supplies the regional area which includes US Forest Service lands downgradient of the well sites. The effect of reducing the aquifer by 2,800 acre-feet per year on the sensitive water -associated biota are not understood, particularly during periods of drought.

Wastewater from the plant will be disposed in three unlined percolation ponds, located east of the power plant site. Water disposed in the percolation ponds may contain elevated concentrations of copper and lead, (TMP 1999a, Table 6.14-5, Appendix J, TMP 1999i). Water quality characteristics of the source water provided by the applicant are based on an existing well (Burney Mountain Power Well) that supplies Burney Mountain Power , two nearby wells, the Johnson Park Well, and a Burney Water District Well (TMP 1999a, Appendix J; TMP 1999b, Table 6.13-5; TMP 1999g, Tables 56-1, 56-2). Water characteristics presented from the Johnson Park well show high levels of lead (49 ug/l), copper (7 ug/l), and manganese (120 ug/l), while the Burney Mountain Well and Burney Water District Well had concentrations below the detection limit for these elements. Water Resource staff felt the applicant's water quality analysis used inadequately high analytical detection limits and requested the tests be redone using a more sensitive method (USEPA Method 200.8 Inductively Coupled Plasma-Mass Spectroscopy). Results of both analyses for constituents of concern are presented in Biological Resources Table 4.

The water quality analyses done in 1999 show notable differences from that done in 1998. Specifically lower values for copper and lead in the Johnson Park well and higher values of copper and lead in the Burney Water District well and Burney Mountain Power well in 1999. The reasons for this are unclear but could be due to higher detection limits and dilution by winter rains. Higher detection limits would account for higher values of copper and lead in the Burney Water District and Burney Mountain Power wells. Dilution caused by winter rains may account for lower concentrations of copper and lead as the sample for this analysis was collected on December 22, 1999, following local rain events. The data does show that the quality of the groundwater varies temporally and basing an analysis on a single sample event is not adequate. The data also shows that samples of groundwater taken from the area have levels of copper and lead that sometimes exceed the EPA's Water Quality Criteria for Aquatic Biota.

The Burney groundwater system consists of highly permeable soils with little or no filtration, and therefore, is highly vulnerable to contamination. The aquifer system is well connected and groundwater travels rapidly. Contamination introduced into the system could move quickly with little containment. SHN (1999) stated that due to the preferential pathways such as fracture and fault zones, it would be difficult if not impossible to obtain sufficient hydrogeologic data to predict water level and water quality impacts.

The applicant has stated that they do not intend to drill wells for this project, and therefore, provide water quality data of the actual source water, until the project is approved (Toth 1999, Pers. Comm.). Without this information, staff is unable to evaluate the actual impacts of the wastewater stream to wildlife. However, if the wells tested are reliable indicators of the source water, the wastewater would have concentrations of copper and lead that exceed acceptable levels. If unlined

BIOLOGICAL RESOURCES Table 4
Water Quality Analysis of Three Wells Located Near the Proposed Project Well Site Showing the Ground Water Concentrations, Estimated Wastewater Concentrations, and Water Quality Criteria to Protect Aquatic Biota.

Johnson Park Well: Hardness 160 ppm

	1998[1]		1999[2]		
	Ground Water Concentration[3]	Wastewater Concentration (x5)	Ground Water Concentration	Wastewater Concentration (x5)	Water Quality Criteria
Boron (ppb)	NP		5.4	27	750,000[4]
Copper (ppb)	7	35*	0.28	1.4	17
Lead (ppb)	49	245*	0.02	0.1	4.2
TDS (ppm)	220	1100	87	435	1400

BWS Well #7: Hardness 42.1 ppm

	1998		1999		
	Ground Water Concentration[1]	Wastewater Concentration (x5)	Ground Water Concentration	Wastewater Concentration (x5)	Water Quality Criteria
Boron (ppb)	NP		3.9	19.5	750,000[2]
Copper (ppb)	ND	0.25	1.5	7.5*	5.2
Lead (ppb)	ND	0.025	0.17	0.85	0.92
TDS (ppm)	79	395	78	390	1400

BMP Well: Hardness 88 ppm

	1998		1999		
	Ground Water Concentration[1]	Wastewater Concentration (x5)	Ground Water Concentration	Wastewater Concentration (x5)	Water Quality Criteria
Boron (ppb)	ND	NP	21	105	750,000[2]
Copper (ppb)	ND	0.25	3.12	15.6*	10
Lead (ppb)	ND	0.025	0.25	1.25	2.1
TDS (ppm)	126	630	100	500	1400

[1] 1998 refers to initial analysis using high detection limits
[2] 1999 refers to analysis using USEPA Method 200.8 Inductively Coupled Plasma-Mass Spectroscopy
[3] NP: Not provided
ND: Not detected
Detection limits: Copper 0.05, Lead 0.005
[4] Criteria for long-term irrigation on sensitive crops
* Exceeds EPA's Water Quality Criteria for Aquatic Biota

percolation ponds are used, this contaminated water would enter the aquifer system. This impact would be more severe during periods of drought when dilution factors are reduced. The applicant has stated that no protective measures will be taken to prevent wildlife from coming into contact with the pond water (TMP 1999f, Data Response #63c). This could lead to toxic exposure to wildlife through drinking and/or wading.

In the PSA, staff stated that the applicant's analysis of cooling tower drift did not include boron. Volcanic regions such as this area may have high concentrations of boron, which can adversely impact conifers. Based on the information provided in Biological Resources Table 4, levels of boron in the ground water and waste water stream are well below levels believed harmful for long-term irrigation of sensitive crops, and therefore, no impacts from boron are expected.

DISPLACEMENT OF WILDLIFE

Indirect effects of the project include displacement of wildlife from construction activities, increased potential for vehicle-related injuries to wildlife, and disturbance to wildlife from noise and lighting during operation. Displacement of wildlife, such as deer and lagomorphs, will be temporary during the construction period. Vehicular accidents can be reduced by enforced speed limits. Noise and lighting disturbance should not greatly exceed current levels at the site. Therefore, none of these impacts are expected to be significant.

TRANSMISSION LINE RECONDUCTORING

Reconductoring of the PG&E 230 kV line will require the removal of existing and installation of new conductors and insulators (TMP 1999h, Data Response #68). Ground crews and helicopters will visit each tower. Old and new insulators will be transported by helicopter. Old conductors will be pulled using the tension stringing method and will not be dragged along the ground or cause crushing or clearing of vegetation. New conductors will be pulled through the new insulators simultaneously. Pull and tension sites will be established every 2-4 miles. Equipment will include one truck-mounted Utah sprocket conductor puller, one or two trailer-mounted take-up spools to reel in old conductors, and various light trucks for workers and materials. Construction will occur from mid-August to December. A 2-5 mile section will require three or four days of work and the helicopter will hover no more than ten minutes above each tower.

PERMANENT AND TEMPORARY LOSS OF HABITAT

Twenty pull sites requiring 3 acres each (60 acres total) have been identified (TMP 1999b Table 3-1, Figures 1 – 121). Pull sites will be graded to provide cleared, flat terrain for pulling and tension vehicles. Habitat types that will be impacted by the pull sites are provided in Biological Resources Table 5. The applicant has stated that these will not be re-vegetated (TMP 1999e, BRMIMP, pg 4-1); however, soils in the area are vulnerable to erosion and staff recommends these pull sites are treated with soil stabilizers and reseeded. Crews will use existing access roads that are in good condition and no grading or other improvements are anticipated. Access to each pull site is identified in TMP 1999b (pages I-2-156 – I-2-165). Transmission towers will not be replaced but some may have to be raised to increase ground

clearance. Raising towers will require a rubber-tired lifting crane to physically lift the entire tower so bolt and vertical extensions can be installed.

BIOLOGICAL RESOURCES Table 5
Habitats Impacted by the Pull Sites for Transmission Line Reconductoring

Habitat	Acres	Pull Site Numbers
Developed	6	1, 20
Blue Oak Woodland	6	2, 6
Annual Grassland	3	3
Annual Grassland, Blue Oak Woodland	6	4,5
Annual Grassland, Wet Meadow	3	17
Mixed Forest	12	7,8,9,10
Burned chaparral, Coniferous Forest	3	11
Coniferous Forest (3 sites burned)	15	12,13,14,18,19
Burned Coniferous Forest, Montane Chaparral	3	15
Ponderosa Pine Forest	3	16
Totals:	**60**	**20**

Reconnaissance level surveys conducted in April 1999 were too early to identify all occurrences of sensitive plant species, but did identify potential areas for occurrence (Biological Resources Table 6). Fourteen sensitive plant species were either present or have moderate to high potential to occur along the route (Biological Resources, Table 2). Two of these, Boggs Lake hedge-hyssop and slender orcutt grass are listed species that inhabit seasonal wetlands or vernal pool areas. Six sites have wetland, vernal pool, and/or marsh habitats. The applicant has stated that pull sites will be located to avoid sensitive areas. The construction period will occur after the flowering period when plant populations may not be identifiable. Therefore, to ensure avoidance, the pull sites must be re-surveyed during the sensitive plant flowering period to delineate plant populations during the same year that reconductoring will take place. Comments on the PSA by California Unions for Reliable Energy (CURE 2000) stated that staff's reliance on pre-construction surveys for sensitive species is insufficient to adequately assess impacts. Staff believes that the level of information provided by surveys to date is sufficient to determine potential occurrences of sensitive species along the transmission line corridor (as identified above and in Biological Resources Table 6). Preconstruction surveys are routinely used by all resource agencies to more precisely identify locations of sensitive species and avoidance areas as close in time to the beginning of construction as possible.

DISPLACEMENT OF WILDLIFE

Thirty-eight sensitive wildlife species have a high or moderate potential to occur along the route (Biological Resources Table 3). Of these, six inhabit waterways (e.g. Shasta crayfish) and four are bats. Waterways and bat roost sites (e.g. caves, mines, bridges) will not be impacted by construction activities. Construction will occur during deer migration and hunting seasons. The presence of equipment, helicopters, and work crews will create disturbances that will deter wildlife from using the area under construction. Deer and other wildlife using the area will likely

be temporarily displaced from the 2-5 mile segment under construction for a duration of 3-4 days. Deer are crepuscular and generally bedded-down during the daylight hours. Displacement of wildlife will be a temporary impact that is not considered significant.

BIOLOGICAL RESOURCES Table 6
Results of Reconnaissance Surveys at or near Pull Sites

Pull Site	Location[1]	Species Present (P) or Potentially Present (x)
1	T29N R4W S1	Wetlands (P), Red Bluff dwarf rush (x),
2	T30N R3W S16	Vernal pools (P), osprey nest (P), bald eagle (P), golden eagle, Cooper's hawk (P), Red Bluff dwarf rush (P), Ahart's paronychia (x), silky cryptantha (x)
3	T31N R3W S34	Vernal pools (P), osprey (P), woolly meadowfoam (P), Red Bluff dwarf rush (x), Ahart's paronychia (x), silky cryptantha (x)
4	T31N R3W S13	Wetlands (P), woolly meadowfoam (P)
5	T32N R2W S32	Red Bluff dwarf rush (x), Ahart's paronychia (x), silky cryptantha (x)
6	T32N R2W S22	Wetlands (P), vernal pools (P)
7	T33N R2W S36	Marsh (P), Butte fritillary (x)
8	T33N R1W S17	Butte fritillary (x)
9	T34N R1W S33	None found
10	T34N R1W S23	Butte County morning glory (x), Stillman's needlegrass (x), Shasta jewel-flower (x), Macnab cypress forest (x).
11	T34N R1E S9	None found - burned
12	T34N R1E S1	None found - burned
13	T34N R2E S5	None found - burned
14	T35N R2E S28	None found - burned
15	T35N R2E S13	Wetlands (P), long-haired star tulip (x)
16	T35N R3E S4	Osprey nest (P)
17	T35N R2E S23	Meadow (P), wetlands (x), long-haired star tulip (x)
18	T35N R2E S3	None found – burned
19	T36N R2E S9	Bald eagle territory (P), spotted owl territory (P), goshawk (x), pine martin (x), fisher (x)
20	T36N R2E S9	Developed

[1]Latitude/Longitude provided in TMP 1999b, Table 3-1.

NEST DISTURBANCE AND AVIAN COLLISION

Several raptors as well as ravens and magpies will use transmission line towers as nest sites. Others, such as the spotted owl and other owl species, nest in tree cavities that may be difficult to detect but susceptible to disturbance from construction activities. Nesting territories and sometimes individual nest sites are often well established and reused for consecutive years. Bald eagle, golden eagle, Cooper's hawk, red-tailed hawk, and osprey individuals and/or tower nest sites were observed. California spotted owl, goshawk, bank swallows, olive-side flycatcher, purple martin, and hermit warbler are known to be present in the area. Other raptors such as northern pygmy owl, northern saw-whet owl, flammulated owl, western screech owl, great-horned owl, sharp-shinned hawks, red-shouldered hawks, American kestrel, white-tailed kite, and northern harriers are undoubtedly present along the route. The nesting period for raptors varies by species, but generally extends from January to mid-August for all species. Disturbances at or

near nest sites during the nesting season can lead to nest abandonment. Additionally, some existing tower nests will be removed or altered to accommodate reconductoring.

Bird mortality from collisions with the transmission lines is well documented and can be high for predatory raptors (CEC 1995). Avian collisions with the existing lines have not been documented. Therefore, the potential for future collisions is unknown. Given the distance of the line and the numbers of raptors present, collision risk is expected to be moderate to high. Collision risk to listed species include the bald eagle and northern spotted owl. Therefore, TMP will be required to obtain Incidental Take Permits from the US Fish and Wildlife Service and California Department of Fish and Game.

CUMULATIVE IMPACTS

The Burney Valley is a rural setting with few industrial developments and residential neighborhoods centered around Burney and Johnson Park. Other new developments planned for the area include a 300-acre, low density residential development west of the site and a 40-acre commercial project at the junction of Highway 299 and State Route 89. The power plant site proper will be located on an industrial site. Wildlife use of the immediate vicinity surrounding the proposed power plant site is primarily deer, raptors, coyotes, and lagomorphs. The loss of approximately 25 acres of ponderosa pine habitat will not cause a significant cumulative impact. The existing transmission line crosses several habitats that support numerous sensitive species. Reconductoring activities will not result in new towers and, if avoidance measures are implemented, will not result in cumulative impacts.

Cumulative impacts from the proposed increase in consumptive use of the Burney aquifer are not quantifiable at this time. Loss of 2,800 acre-feet per year appears to be acceptable during normal precipitation years, but may be a significant impact to aquatic- associated biota dependent on groundwater-fed springs and creeks during periods of prolonged drought. Additionally, loss of 2,800 acre-feet per year to Burney Falls could have repercussions related to the Central Valley Project Improvement Act, which allocates water to various users such as industry, agriculture, and biological resources. Staff can not make a final determination until the staff's water resources analysis is complete, which is scheduled for early March 2000.

MITIGATION

The applicant has proposed mitigation measures to avoid or reduce impacts to biological resources (TMP 1999a, Section 6.13.3; TMP 1999b Section 6.1, Appendix I, Section 4.1). Staff has proposed additional measures to reduce impacts. The applicant has also developed a draft Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) that provides more detail for implementing mitigation measures (TMP 1999e). Staff has reviewed the draft and provided comments to the applicant. A review by U.S. Fish and Wildlife Service is in

progress. A final BRMIMP should be provided for CEC and other agency review and approval prior to start of any construction activities.

THE APPLICANT'S PROPOSED MITIGATION MEASURES

GENERAL

- Locate laydown areas on disturbed sites and at least 100 feet away from sensitive resource areas
- Minimize construction corridor widths
- Mark and avoid sensitive resource areas
- Restrict traffic to designated roads
- Brief contractors on location of construction zone boundaries and other mitigation measures
- Control erosion and sedimentation
- Preserve and, within two weeks, replace six inches of topsoil in temporary construction areas
- Recontour in disturbed areas and re-seed with a grass mixture
- Inspect open trenches for entrapped wildlife each morning and before re-filling with soil
- Provide a qualified biologist to monitor construction activities
- Conduct compliance inspections once a week
- Provide annual compliance reports and a post construction report 45 days after the project is completed

RECONDUCTORING ACTIVITIES

- Develop a Raptor Management Plan for reconductoring activities along the existing transmission line
- Design transmission lines to reduce risk of avian electrocution
- Conduct activities between mid-August and December to avoid the raptor nesting season
- Preserve existing tower nests whenever feasible
- Conduct preconstruction surveys at pull sites
- Travel only on existing access roads
- Avoid wetlands and other sensitive resource areas

CEC STAFF PROPOSED MITIGATION MEASURES

To ensure biological resources are avoided and to minimize impacts to natural areas, staff proposes the following additional mitigation measures:

- Provide an alternative method of waste water disposal than the proposed percolation ponds in order to prevent percolation of contaminates into the aquifer and prevent potential contact with wildlife, but allow access by the Burney Basin Mosquito Abatement District.
- Prohibit addition or removal of any dredge material to or from wetlands.
- Prohibit vehicles from entering any stream, river, or creek bed.
- Restrict pull site locations to disturbed areas, chaparral or grassland habitats under the existing transmission line corridor.
- Treat the pull site locations with soil stabilizers and reseed with native forbs and grasses.
- Provide a biological monitor, knowledgeable in raptor biology, during reconductoring activities.
- Provide the biological monitor on a daily basis when reconductoring activities occur at pull sites with sensitive resources present.
- Conduct botanical surveys during the blooming periods of plants listed in Biological Resources Table 2 and delineate avoidance and buffer zones around sensitive plant populations and wetland habitats.
- Conduct surveys for dead birds under the existing transmission during the botanical surveys.
- Implement measures to reduce avian collisions in the event that the incidence of avian collision is high.

FACILITY CLOSURE

PERMANENT FACILITY CLOSURE

The anticipated life expectancy of power plants is 30 years. Planned or unexpected closure must adhere to measures that ensure no significant impacts to biological resources. The applicant must develop an "on-site contingency plan" to address facility closure and include this plan in the BRMIMP. The proposed power plant will be built on a site that is currently disturbed. The linear pipelines will be re-vegetated, and impacts associated with their construction are temporary. The existing transmission line will service projects in addition to the TMPP. Therefore, the contingency plan need only address the percolation ponds, hazardous materials, and the new transmission line.

TEMPORARY FACILITY CLOSURE

No impacts to biological resources should occur in the event of temporary facility closure. Therefore, no mitigation measures are required.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Construction and operation of the TMPP as proposed may have significant impacts on biological resources. The proposed project has the potential to impact sensitive aquatic-associated species from aquifer contamination and from increased groundwater consumption, particularly during drought periods. Aquifer contamination can be eliminated by alternative methods of wastewater discharge that will not allow toxic levels of copper and lead to percolate into the aquifer. The impacts from increased groundwater consumption are not understood because a water budget simulating drought periods has not been conducted. However, reductions in groundwater could result in decreased or dried springs or streams in the project's well site area that could significantly impact US Forest Service sensitive species, federal species of concern, and state species of special concern. While none of these species are listed as federally or state threatened or endangered, the range and status of many have not yet been described. Once that is complete, listing may be in order due to their limited range and highly endemic nature. Many of these species are dependent on high quality and high quantity aquifer flows. Some are dependent on low flow springs (less than one cubic-feet per second) that could dry during periods of low aquifer recharge. The aquifer that would supply the project water needs also supplies the regional water needs, which includes forest service lands upon which the Forest Service sensitive species are protected. The Northwest Forest Plan and its Standards and Guidelines call for maintaining spatial and temporal connectivity within and between watersheds to provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species and to maintain in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats.

Appendix J of CEQA defines an impact to be significant if it:

1. Has a substantial adverse effect, either directly or indirectly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations.
2. Has a substantial adverse effect on any riparian habitat

The lack of information to adequately determine if habitat modifications to the aquifer will have a substantial adverse effect on the springs, streams, and rivers or on aquatic-associated special status species in the area.

The reconductoring activities have the potential to impact wetland habitats and raptors if mitigation measures proposed by the applicant and staff are not implemented. The applicant must conduct botanical surveys at the appropriate time of year, document current levels of avian mortality, and create avoidance zones around sensitive areas, and reseed areas graded for pull sites. Staff will require the

applicant to provide a final BRMIMP that includes very detailed instructions for implementing mitigation measures that ensure avoidance of sensitive areas.

COMPLIANCE WITH LORS

The applicant intends to avoid all sensitive wildlife, plant, and wetland, and riparian areas, and therefore, did not intent to initiate consultation with U.S. Fish and Wildlife Service, California Department of Fish and Game, or U.S. Army Corps of Engineers. However, the potential for collision of listed birds with the powerlines will require the applicant to consult with and acquire Incidental Take Permits from U.S. Fish and Wildlife Service and California Department of Fish and Game. Staff concurs that no permits will be necessary from the U.S. Army Corps of Engineers provided that strict avoidance measures to waterways are adhered to. Staff will request the applicant to obtain a letter from this agency stating their concurrence with this assessment. Because portions of the reconductoring activity will occur on federal Forest Service lands, staff will also require the applicant to obtain letters from Shasta National Forest stating their approval.

RECOMMENDATIONS

Staff can not recommend the Energy Commission approve the proposed project due to the potential for aquifer contamination and to the lack of information necessary to determine impacts to biological resources from groundwater consumption during drought conditions. Staff will rely on conclusions of the Water Resources FSA to reach a final conclusion and recommendation. The following Conditions of Certification are proposed and additional Conditions may be necessary pending forthcoming information requested of the applicant by water resource staff or terms and conditions of the state and federal agencies mentioned above.

CONDITIONS OF CERTIFICATION

DESIGNATED BIOLOGIST

BIO-1 Construction site and/or ancillary facilities preparation (described as any ground disturbing activity other than Energy Commission approved geotechnical work) shall not begin until an Energy Commission CPM approved Designated Biologist is available to be on site.

Protocol: The Designated Biologist must meet the following minimum qualifications:

1. a Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;
2. three years of experience in field biology;
3. one year of field experience with biological resources found in or near the project area including the plant and raptor species and wetlands; and

4. an ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for the biological resources tasks that must be addressed during project construction and operation.

If the CPM determines the proposed Designated Biologist to be unacceptable, the project owner shall submit another individual's name and qualifications for consideration. If the approved Designated Biologist needs to be replaced, the project owner shall obtain approval of a new Designated Biologist by submitting to the CPM the name, qualifications, address, and telephone number of the proposed replacement. No disturbance will be allowed in any designated sensitive areas until the CPM approves a new Designated Biologist and the new biologist is on site.

Verification: At least 60 days prior to the start of any ground disturbance activities, the project owner shall submit to the CPM for approval, the name, qualifications, address and telephone number of the individual selected by the project owner as the Designated Biologist. If a Designated Biologist is replaced, the information on the proposed replacement, as specified in the condition, must be submitted in writing at least ten working days prior to the termination or release of the preceding Designated Biologist.

BIO-2 The CPM approved Designated Biologist shall perform the following during project construction and operation:

1. advise the project owner's Construction Manager on the implementation of the Biological Resource Conditions of Certification;
2. supervise or conduct surveys, mitigation, daily monitoring and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as, wetlands and special status species;
3. prohibit workers and vehicles from entering or disturbing designated sensitive areas or creeks, rivers, and streams; and
4. notify the project owner and the CPM of any non-compliance with any Biological Resources Condition of Certification.

Verification: During project construction, the Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted along with the Monthly Compliance Reports to the CPM. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

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

Protocol: The project owner's Construction Manager shall halt, if necessary, all construction activities in areas specifically identified by the Designated Biologist as sensitive to assure that potential significant biological resource impacts are avoided.

The Designated Biologist shall:

1. inform the project owner and the Construction Manager when to resume construction, and
2. advise the CPM if any corrective actions are needed or have been instituted.

Verification: Within two (2) working days of a Designated Biologist notification of non-compliance with a Biological Resources condition of certification or a halt of construction, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem or the non-compliance with a condition. For any necessary corrective action taken by the project owner, a determination of success or failure will be made by the CPM within five (5) working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION & MONITORING PLAN

BIO-4 The project owner shall submit to the CPM for review and approval a copy of the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and, once approved, shall implement the measures identified in the plan.

Protocol: The final BRMIMP shall identify:

1. all Biological Resource Conditions included in the Commission's Final Decision;
2. protocols for conducting botanical, dead bird, and raptor nest surveys along the existing transmission line;
3. provisions for mitigating avian collision, if applicable;
4. Provisions for preventing wildlife from coming into contact with evaporation ponds;
5. a list and a map of locations of all sensitive biological resources to be impacted, avoided, or mitigated by project construction and operation;
6. a list of all terms and conditions of USFWS, CDFG, USFS and U.S. ACE, if applicable;
7. a detailed description of measures, Best Management Practices, and take avoidance measures that will be implemented to avoid and/or minimize impacts to sensitive species and reduce habitat disturbance;
8. all locations, on a map of suitable scale, of laydown areas and areas requiring temporary protection and avoidance during construction;
9. aerial photographs (scale 1:200) of all pull sites- one set prior to site disturbance and one set after project construction. Include planned timing of aerial photography and a description of why times were chosen;
10. a raptor management plan and re-vegetation plan;

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 discussion of biological resource-related facility closure measures; and
15. a process for proposing plan modifications to the CPM and appropriate agencies for review and approval.

Verification: At least 45 days prior to start of any project-related ground disturbance activities, the project owner shall provide the CPM with the final version of the BRMIMP for this project, and the CPM will determine the plans acceptability. The project owner shall notify the CPM five (5) working days before implementing any CPM approved modifications to the BRMIMP.

Within 30 days after completion of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which mitigation and monitoring plan items are still outstanding.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

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

Protocol: The Worker Environmental Awareness Program must:

1. be developed by the Designated Biologist and consist of an on-site or training center presentation in which supporting written material is made available to all participants;
2. discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
3. present the reasons for protecting these resources;
4. present the meaning of various temporary and permanent habitat protection measures; and
5. identify whom to contact if there are further comments and questions about the material discussed in the program.

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

Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall

abide by the guidelines set forth in the program materials. The person administering the program shall also sign each statement.

Verification: At least 60 days prior to the start of rough grading, the project owner shall provide copies of the Worker Environmental Awareness Program, all supporting materials, and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. The signed statements for the construction phase shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six (6) months after the start of commercial operation. During project operation, signed statements for active project operational personnel shall be kept on file for the duration of their employment and for six (6) months after their termination.

AGENCY COMPLIANCE

BIO-6 Prior to start of any ground disturbance activities, the project owner shall acquire Incidental Take Permits from U.S. Fish and Wildlife Service and California Department of Fish and Game, and a letter from U.S. Army Corps of Engineers stating that permits are not required from that agency for the construction and operation of the Three Mountain Power Project and implement any terms and conditions of those agencies.

Verification: No less than ninety (90) days prior to the start of any project related ground disturbance activities, the project owner shall submit to the CPM a copy of the final letters from CDFG, USFWS, and USACE stating that permits from that particular agency are not required for this project. Any terms and conditions stated in those letters shall be incorporated into the final Biological Resources Mitigation Implementation and Monitoring Plan.

BIO-7 Prior to start of any ground disturbance activities, the project owner shall obtain a letter from Shasta National Forest stating their approval of construction activities that will occur on Forest Service lands and implement any terms and conditions.

Verification: No less than ninety (90) days prior to the start of any project related ground disturbance activities, the project owner shall submit to the CPM copies of the letters from the Shasta and National Forest and incorporate any terms and conditions into final Biological Resources Mitigation Implementation and Monitoring Plan.

PRECONSTRUCTION SURVEYS

BIO-8 Prior to start of any reconductoring activities, the project owner shall conduct surveys for sensitive plant species during the appropriate blooming period and concomitant surveys for dead birds and raptor nests along the existing transmission line corridor.

Verification: No less than thirty (30) days prior to the start of any project related ground disturbance activities, the project owner shall submit to the CPM a report of results from the plant, bird, and nest surveys. The report shall specify and map locations of sensitive resources and bird mortalities, and discuss avoidance measures and any necessary remedial actions.

GENERAL MITIGATION

BIO-9 The project owner shall implement the following mitigation measures and incorporate these into the BRMIMP.

1. prohibit the removal or addition of dredge material into any wetlands.
2. construct the evaporation ponds in a manner that prohibits direct contact with wildlife and contamination of the ground water.
3. prohibit vehicles from entering any stream, river, or creek bed.
4. restrict pull site locations to disturbed areas, previously cleared areas such as chaparral or grassland habitats lacking vernal pools or wetlands.
5. treat all pull sites with soil stabilizers and native seed treatments to reduce erosion

Verification: Within thirty days after completion of the project construction, the project owner shall submit a post-construction compliance report that describes how the above mitigation measures were implemented.

THE APPLICANT'S MITIGATION

BIO-10 The project owner shall implement the mitigation measures identified in Section 6.13.3 of the applicant's Application For Certification (TMP 1999a) and in Section 6.1 and Appendix I, Section 4.1 of the applicant's supplemental filing (TMP 1999b). The project owner shall incorporate these mitigation measures into the BRMIMP unless the measures conflict with those required by U.S. Fish and Wildlife, California Department of Fish and Game, or Energy Commission Conditions.

1. Minimize width of construction corridor to 50 feet for pipelines and 200 feet for the new transmission line corridor.
2. Design and locate staging areas and access/construction roads to disturbed areas whenever possible and at least 100 feet away from areas supporting sensitive species.
3. Construction area boundaries will be clearly delineated by flagging or fencing to minimize disturbance to natural habitat.
4. Control erosion and sedimentation by conducting construction activities during dry periods, and by using silt fences, sandbags, and detention basins.
5. Preserve and, within two weeks, replace topsoil from areas temporarily impacted. Replaced topsoil will be decompacted to a depth of 18 inches. Original grades will be restored with a minimum of 6 inches of topsoil.
6. Re-vegetate linear corridors with native seed mixtures.

7. Restrict traffic to established roads, designated access roads, construction areas, storage areas, staging areas or parking areas.
8. Inspect open trenches for wildlife prior to start of daily construction activities. Any wildlife observed will be allowed to escape on its own. If necessary, ramps and side exits will be placed in the trench every 0.25 mile.
9. Reconductoring activities will only occur from mid-August through December to avoid the raptor nesting season.
10. Contractors will be briefed on location of construction zones, avoidance of sensitive biological resource areas, and other mitigation measures.
11. Develop a Raptor Management Plan for reconductoring activities along the transmission line.
12. Design transmission line to reduce collision and electrocution risk.
13. Preserve existing tower nests whenever feasible.
14. All sensitive resources areas will be avoided.

Verification: During project construction, the project owner shall provide monthly compliance reports stating activities completed, mitigation measures implemented, sensitive biological resources areas encountered, raptor nests removed, and any infractions by construction personnel. Within thirty days after completion of the project construction, the project owner shall submit a post-construction compliance report that describes the following details: dates that construction occurred; data concerning success in meeting project mitigation measures; known project effects on any sensitive species encountered during the construction phase; an assessment of the extent and severity of project impacts on all sensitive wildlife habitats; and other appropriate information.

FACILITY CLOSURE

BIO-11 The project owner will incorporate into the planned permanent or unexpected permanent closure plan measures that address the local biological resources. The biological resource facility closure measures will also be incorporated into the EHPP project BRMIMP.

Protocol: The planned permanent or unexpected permanent closure plan will require the following biological resource-related mitigation measures:

1. removal of transmission conductors and evaporation ponds when they are no longer used and useful; and
2. measures to restore wildlife habitat to promote the re-establishment of native plant and wildlife species.
3. measures to remove all toxic and hazardous materials from the site.

Verification: At least 12 months (or a mutually agreed upon time) prior to the commencement of closure activities, the project owner shall address all biological resource-related issues associated with facility closure in a Biological Resources Element. The Biological Resources Element will be incorporated into the Facility Closure Plan, and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

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GEOLOGY AND PALEONTOLOGY

Testimony of Robert Anderson

INTRODUCTION

The geology section discusses the project's potential impacts regarding geological hazards, geological and paleontological resources, and surface water hydrology. The purpose of the geology analysis is to verify that the applicable laws, ordinances, regulations, and standards (LORS) have been identified and that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to significant geological and paleontological resources, and surface water hydrology during project construction, operation and closure. The section concludes with the staff's proposed monitoring and mitigation measures with respect to geological hazards, geological and paleontological resources, and surface water hydrology, with the inclusion of nine conditions of certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The applicable LORS are listed in the AFC, in Sections 6.14, 6.16, and 6.17 (TMP 1999a). A brief description of the LORS for paleontological resources, geological hazards and resources, and surface water hydrology follows:

FEDERAL

There are no federal LORS for geological hazards and resources, or grading and erosion control. The Three Mountain Power Project (TMPP) is not located on lands under the jurisdiction of the United States Bureau of Land Management. It is Energy Commission staff's understanding that the reconductoring corridor is owned or leased to the Pacific Gas and Electric Company. A portion of the reconductoring corridor is understood to cross land adminsitered by the United States Forest Service, but leased to the Pacific Gas and Electric Company.

The Federal Land Policy and Management Act (FLPMA), Title 43, United States Code sections 1701-1784, requires that public land be managed in such a way that items of scientific interest (including paleontological resources) are protected.

STATE AND LOCAL

The California Building Code (CBC) 1998 edition is based upon the Uniform Building Code (UBC), 1997 edition, which was published by the International Conference of Building Officials. The CBC is a series of standards that are used in the investigation, design (Chapters 16 and 18) and construction (including grading and erosion control as found in Appendix Chapter 33) that were based upon the UBC that includes supplemental standards specific to California. The CBC supplements their grading and construction ordinances and regulations.

The California Environmental Quality Act (CEQA) Guidelines Appendix G provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.

Sections (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geological hazards.

Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

Public Resources Code section 5097.5 requires that no person shall cause the destruction or removal of vertebrate paleontologic resources on public lands unless express permission of the public agency having jurisdiction over the lands has been granted.

The Standard Procedures, Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources (SVP 1994) are a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. They were adopted in October 1994 by a national organization of vertebrate paleontologists (the Society of Vertebrate Paleontologists).

SETTING

The TMPP is made up of two major elements, a 500 megawatt power plant and a sixty mile long 230 kilovolt (kV) electric transmission line reconductoring project. The powerplant is proposed to be sited in Burney Valley, which is located in the southern portion of the Cascade Range/Modoc Plateau geomorphic province. The TMPP is located on Pleistocene age basalt, which is partially covered by a thin veneer of alluvial soil. No surface water bodies are located on or adjacent to the power plant footprint. The existing grade of the power plant footprint is shallow (less than 5%). A small detention basin is located to the northeast of the existing biomass power plant at the proposed power plant location.

ANALYSIS AND IMPACTS

FAULTING AND SEISMICITY

No active faults are known to cross the proposed power plant footprint. Several faults cross the transmission line corridor that is to be reconductored. None of the faults are considered to pose a greater hazard to the transmission line or transmission line towers than if the reconductoring project were not to take place. The closest known fault to the power plant footprint is the Rocky Ledge fault which is located approximately 0.8 miles to the northeast. The project is located within seismic zone 3 as delineated on Figure 16-2 of the 1998 edition of the California

Building Code. The estimated peak horizontal ground acceleration for the power plant is 0.42g. This value is associated with a magnitude 6.5 earthquake on the Susanville fault six miles west of the power plant footprint. Table 6.17-11 of the AFC (TMP 1999a) does not provide enough information to estimate a peak horizontal ground acceleration from an earthquake on the Rocky Ledge fault of approximately 0.5g. It is recommended that the applicant determine the peak horizontal ground acceleration for the power plant location based upon the maximum credible earthquake for the Rocky Ledge fault. The peak horizontal ground acceleration for the proposed power plant site should then be reassessed once peak horizontal ground acceleration for the power plant location has been clarified. The potential of surface rupture on a fault at the power plant footprint is considered to be very low, since no faults are known to cross the proposed power plant location.

Based upon Energy Commission staff's review of the California Division of Mines and Geology publication "Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions," dated 1994, the reconductoring corridor does not cross any known active faults. However, the reconductoring corridor crosses several unnamed quaternary age faults located approximately 4 to 4.5 miles west of the proposed power plant footprint and a second quaternary age fault near Hatchet Mountain pass. None of the faults are considered to have a significant impact on the reconductoring project since the existing transmission line towers to be used in the reconductoring effort are not known to straddle the faults.

LIQUEFACTION, HYDROCOMPACTION, SUBSIDENCE, AND EXPANSIVE SOILS

Liquefaction is a condition in which a cohesionless soil may lose shear strength due to a sudden increase in pore water pressure. One of the parameters used to assess the potential for liquefaction is the depth to ground water at the site under study. Generally the depth to ground water at a site should be less than 100 feet for liquefaction to be possible. The depth to groundwater beneath the site has not been established. However, the depth to groundwater in a nearby water well field is approximately 240 feet below the existing ground surface (Lawrence and Associates 1999a). Due to the dense consolidated nature of the volcanics under the site, the potential for liquefaction at the power plant site is considered to be negligible.

Hydrocompaction is the process of the loss of soil volume upon the application of water. The soils at the site are dense enough that hydrocompaction is not considered to be a significant problem at the power plant location.

Lava tubes are know to occur in the vicinity of Burney; however, no lava tubes are known to cross the powerplant footprint. Heavy structures built over lava tubes with a thin overburden of soil and/or rock may cause the roof of the tube to collapse and the structure to fall into the tube. A more detailed assessment of the power plant site conditions should indicate if lava tubes are present or not. Other than the potential of an unknown lava tube roof collapse, subsidence of the soil or rock

beneath the power plant footprint is unlikely since the soil veneer over the basalt is thin and the basalt is very dense.

Soils that contain a high percentage of expansive clay minerals are prone to expansion, if subjected to an increase in water content. Expansive soils are usually measured with an index test such as the expansive index potential. In order for a soil to be a candidate for testing, the soil must have a high clay content and the clay must have a high shrink-swell potential and a high plasticity index. Soil samples tested by TMPP show the soils to have a low plasticity index and are considered to have a low potential for expansion since plasticity index values for on-site soils are low (7 to 11) (TMPP AFC, page K-11).

GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

No geological resources have been identified at the power plant location, the natural gas supply line route, or the water supply line route. The reconductoring corridor crosses an area designated by the State to be MRZ-2b (known marginal mineral reserves) in two locations. Mineralogical resources along the reconductoring corridor include sand, gravel and diatomite. The areas where the reconductoring corridor crosses mineralogical resource zones are not considered to have a significant impact since the transmission line towers are already in place, as are the transmission line set and pull locations.

Regarding paleontological resources, Energy Commission staff has reviewed the supplement to the AFC (TMP 1996b). In addition, Energy Commission staff has worked in the Chico, Tehama, Red Bluff, Modesto, and River Bank Formations, and alluvium and basalt in the vicinity of the power plant footprint in the past, and is familiar with the formations, alluvium and basalt with respect to their potential for geologic and paleontologic resources. Geology at the power plant footprint location is made up of alluvium overlying basalt. Basalt is formed by the cooling of lava at or near the surface of the earth. The origin of the basalt is clearly not conducive to the preservation of plants or animals. The alluvium is considered to be too young to contain fossils. No fossils were observed by staff at the power plant during a site visit on August 18, 1999. No paleontological resources are known to exist at the power plant footprint. Several of the formations have a high paleontological significance but a low potential for being encountered. There is a set up and cable pull area where shell fragments are exposed. No other macro fossils are known to exist at the cable pull areas along the reconductoring corridor. Staff have proposed conditions of certification that will enable the applicant to mitigate impacts upon paleontological resources to a less than significant level should they be encountered during construction, operation, and closure of the project.

SURFACE WATER HYDROLOGY

The power plant footprint is not located within a 100-year flood zone. Minimum grade for the power plant area will be 1% and all drainage will be directed away from buildings within the footprint. Power plant spill containment features are described by the applicant to have a minimum of one foot of freeboard. The 100-year 24-hour storm event precipitation amount is 5 inches. Run-off during a 100-year 24-hour

storm event should not overwhelm the capacity of the proposed surface water drainage system.

FACILITY CLOSURE

A definition and general approach to closure is presented in the General Conditions section of this document. Facility closure activities are not anticipated to impact geological or paleontological resources. This is due to the fact that no paleontological or geological resources are known to exist at the power plant location. In addition, decommissioning and closure of the power plant should not negatively affect geological or paleontological resources since the majority of the ground disturbed in plant decommissioning and closure would have been disturbed in the construction of the plant. Surface water hydrology impacts will depend upon the closure activities proposed.

POTENTIAL IMPACTS

SITE SPECIFIC IMPACTS

The project is not likely to have any impact on geological or paleontological resources, surface water resources, or geological hazards.

CUMULATIVE IMPACTS

It is staff's opinion that the potential for a significant adverse cumulative impact on paleontological resources, geological resources, or surface water hydrology is unlikely, if the TMPP is constructed according to the proposed conditions of certification. This opinion is based on the fact that the site is not known to have significant paleontological or geological resources.

MITIGATION

Based upon the literature and archives search, field surveys and the preliminary geotechnical investigation for the project, the applicant has proposed monitoring and mitigation measures to be followed during the construction of the power plant, related natural gas supply line, electrical transmission line, and the waste water pipelines. Energy Commission staff agree with the applicant that there is a low probability that vertebrate fossils will be encountered during construction of the power plant and related features.

The proposed conditions of certification are to allow the Energy Commission Compliance Project Manager (CPM) and the applicant to adopt a compliance monitoring scheme that will ensure LORS applicable to geological hazards, geological and paleontological resources, and surface water hydrology for the project are complied with.

APPLICANT'S COMMENTS ON PSA

In their January 7, 2000 comments on staff's PSA, the applicant requested changes to three Conditions of Certification, PALEO-1 through -3. These requested changes can be summarized thus:

1. Reduce the lead time, before work commences, for gaining CPM approval of the designated paleontological resource specialist, the paleontological Monitoring and Mitigation Plan, and the employee training program.

2. Require the CPM to approve or reject submittals within 15 days; otherwise, submittals are assumed to be approved.

Staff has established the lead time requirements of these conditions to protect the project construction schedule should a proposed specialist, plan or program prove unacceptable. It should be no hardship for the applicant to contract for the specialist, and prepare the plan and program, within these time frames. On the other hand, should these items be submitted later, closer to actual construction, and be found unacceptable, the impact on construction schedule could be great. Delays would be costly to the applicant; proceeding without the approvals could result in significant unmitigated adverse impacts on the environment. Staff cannot recommend accepting these requested changes.

Staff, through the CPM, strive to give timely turnaround for all submittals requiring approval. Allowing work to continue without a response from the CPM leaves open the possibility of significant unmitigated adverse impacts on the environment. Staff cannot recommend accepting this requested change.

CONCLUSION AND RECOMMENDATIONS

The applicant will likely be able to comply with applicable LORS. The project should have no adverse impact with respect to geological and paleontological resources. Staff proposes to ensure compliance with applicable LORS for geological hazards, geological and paleontological resources and surface water hydrology with the adoption of the proposed conditions of certification listed below. It is recommended that the applicant determine the peak horizontal ground acceleration for the power plant location based upon the maximum credible earthquake for the Rocky Ledge fault. The peak horizontal ground acceleration for the proposed power plant site should then be reassessed once peak horizontal ground acceleration for the power plant location has been clarified.

PROPOSED CONDITIONS OF CERTIFICATION

GEO-1 Prior to the start of construction, the project owner shall assign to the project an engineering geologist(s), certified by the State of California, to carry out the duties required by the 1998 edition of the California Building Code (CBC) Appendix Chapter 33, Section 3309.4. The certified engineering geologist(s) assigned must be approved by the CPM. The functions of the

engineering geologist can be performed by the responsible geotechnical engineer, if that person has the appropriate California license.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the Chief Building Official (CBO)) prior to the start of construction, the project owner shall submit to the CPM for approval the name(s) and license number(s) of the certified engineering geologist(s) assigned to the project. The submittal should include a statement that CPM approval is needed. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of its findings within 15 days of receipt of the submittal. If the engineering geologist(s) is subsequently replaced, the project owner shall submit for approval the name(s) and license number(s) of the newly assigned individual(s) to the CPM. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of the findings within 15 days of receipt of the notice of personnel change.

GEO-2 The assigned engineering geologist(s) shall carry out the duties required by the 1998 CBC, Appendix Chapter 33, Section 3309.4 Engineered Grading Requirement, and Section 3318.1 – Final Reports. Those duties are:

1. Prepare the Engineering Geology Report. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit.

2. Monitor geologic conditions during construction.

3. Prepare the Final Engineering Geology Report.

Protocol: The Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3309.3 Grading Designation, shall include an adequate description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and an opinion on the adequacy of the site for the intended use as affected by geologic factors.

The Final Engineering Geology Report to be completed after completion of grading, as required by the 1998 CBC Appendix Chapter 33, Section 3318.1, shall contain the following: A final description of the geology of the site and any new information disclosed during grading; and the effect of same on recommendations incorporated in the approved grading plan. The engineering geologist shall submit a statement that, to the best of his or her knowledge, the work within their area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of this chapter.

Verification: (1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations

contained in the report are incorporated into the plans and specifications. (2) Within 90 days following completion of the final grading, the project owner shall submit copies of the Final Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3318 Completion of Work, to the CPM and the CBO.

PAL-1 Prior to the start of any project-related construction activities (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall ensure that the designated paleontological resource specialist approved by the CPM is available for field activities and prepared to implement the conditions of certification.

The designated paleontological resources specialist shall be responsible for implementing all the paleontological conditions of certification and for using qualified personnel to assist in this work.

Protocol: The project owner shall provide the CPM with the name and statement of qualifications for the designated paleontological resource specialist.

The statement of qualifications for the designated paleontological resources specialist shall demonstrate that the specialist meets the following minimum qualifications: a degree in paleontology or geology or paleontological resource management; and at least three years of paleontological resource mitigation and field experience in California, including at least one year's experience leading paleontological resource mitigation and field activities.

The statement of qualifications shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

If the CPM determines that the qualifications of the proposed paleontological resource specialist do not satisfy the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

If the approved, designated paleontological resource specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontological resource specialist by submitting the name and qualifications of the proposed replacement to the CPM, at least ten (10) days prior to the termination or release of the preceding designated paleontological resource specialist.

Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

Verification: At least ninety (90) days prior to the start of construction, the project owner shall submit the name and resume and the availability for its designated paleontological resource specialist, to the CPM for review and approval. The CPM shall provide written approval or disapproval of the proposed paleontological resource specialist.

At least ten (10) days prior to the termination or release of a designated paleontological resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated paleontological resource specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

PAL-2 Prior to the start of project construction, the designated paleontological resource specialist shall prepare a Paleontological Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontological resources, and submit this plan to the CPM for review and approval. After CPM approval, the project owner's designated paleontological resource specialist shall be available to implement the Monitoring and Mitigation Plan, as needed, throughout project construction.

In addition to the project owner's adoption of the guidelines of the Society of Vertebrate Paleontologists (SVP 1994) the Paleontological Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:

- A discussion of the sequence of project-related tasks, such as any pre-construction surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation;
- Identification of the person(s) expected to assist with each of the tasks identified within this condition for certification, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities;
- Where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur and a schedule for the monitoring;
- An explanation that the designated paleontological resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined;
- A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove,

load, transport, and analyze large-sized fossils or extensive fossil deposits;

- Inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontological resources; and
- Identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work, discussion of any requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution.

Verification: At least sixty (60) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the Monitoring and Mitigation Plan prepared by the designated paleontological resource specialist for review and approval. If the plan is not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes.

PAL-3 Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated paleontological resource specialist shall prepare and conduct CPM-approved training to all project managers, construction supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontological resources or deposits that may be discovered during project-related ground disturbance.

Protocol: The paleontological training program shall discuss the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall also include the set of reporting procedures that workers are to follow if paleontological resources are encountered during project activities. The training program shall be presented by the designated paleontological resource specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least (30) thirty days prior to the start of project construction, the project owner shall submit to the CPM for review, comment, and written approval, the proposed employee training program and the set of reporting procedures the workers are to follow if paleontological resources are encountered during project construction.

If the employee training program and set of procedures are not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes, before the beginning of construction.

Documentation for training of additional new employees shall be provided in subsequent Monthly Compliance Reports, as appropriate.

PAL-4 The designated paleontological resource specialist shall be present at all times he or she deems appropriate to monitor construction-related grading, excavation, trenching, and/or augering in areas where potentially fossil-bearing sediments have been identified. If the designated paleontological resource specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner.

Verification: The project owner shall include in the Monthly Compliance Reports a summary of paleontological activities conducted by the designated paleontological resource specialist.

PAL-5 The project owner, through the designated paleontological resource specialist, shall ensure recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files copies of signed contracts or agreements with the designated paleontological resource specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation for and delivery of all significant paleontological resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resources Report and shall keep these files available for periodic audit by the CPM.

PAL-6 The project owner shall ensure preparation of a Paleontological Resources Report by the designated paleontological resource specialist. The Paleontological Resources Report shall be completed following completion of the analysis of the recovered fossil materials and related information. The project owner shall submit the paleontological report to the CPM for approval.

Protocol: The report shall include (but not be limited to) a description and inventory list of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the paleontological resource specialist that project impacts to paleontological resources have been mitigated.

Verification: The project owner shall submit a copy of the Paleontological Resources Report to the CPM for review and approval under a cover letter stating that it is a confidential document. The report is to be prepared by the designated paleontological resource specialist within 90 days following completion of the analysis of the recovered fossil materials.

PAL-7 The project owner shall include in the facility closure plan a description regarding facility closure activity's potential to impact paleontological resources. The conditions for closure will be determined when a facility closure plan is submitted to the CPM twelve months prior to closure of the facility. If no activities are proposed that would potentially impact paleontological resources, then no mitigation measures for paleontological resource management are required in the facility closure plan.

Protocol: The closure requirements for paleontological resources are to be based upon the Paleontological Resources Report and the proposed grading activities for facility closure.

Verification: The project owner shall include a description of closure activities described above in the facility closure plan.

REFERENCES

CDMG (California Division of Mines and Geology). 1994a. Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions.

L&A (Lawrence and Associates). 1999a. Ground-Water Resource Evaluation of the Burney Basin and Effects of Ground-Water and Wastewater Disposal from the Proposed Three Mountain Power Plant Burney, Shasta County, California, page 6. Dated April 19, 1999. Submitted to the California Energy Commission April 28, 1999.

SVP (Society of Vertebrate Paleontologists). 1994. Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures. October 1994.

TMP (Three Mountain Power, LLC.) 1999a. Application for Certification, Three Mountain Power Plant Project. Submitted to the California Energy Commission, March 3, 1999.

TMP (Three Mountain Power, LLC.) 1999b. Additional Information for its Application for Certification, Three Mountain Power Plant Project, Submitted to the California Energy Commission, June 3, 1999.

FACILITY DESIGN

Testimony of Steve Baker, Al McCuen and Kisabuli

INTRODUCTION

Facility Design encompasses the civil, structural, mechanical and electrical engineering aspects of the project. The purpose of the Facility Design analysis is to verify that laws, ordinances, regulations and standards (LORS) applicable to the design and construction of the project have been identified; and that the project and ancillary facilities have been described in sufficient detail, including design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety.

This analysis also examines whether special design features should be considered during final design to deal with conditions unique to the site which could influence public health and safety, environmental protection or the operational reliability of the project. This analysis further identifies the design review and construction inspection process and establishes conditions of certification that will be used to ensure compliance with the intent of the LORS and any special design requirements.

FINDINGS REQUIRED

The Warren Alquist Act requires the commission to "prepare a written Decision ….which includes…(a) Specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality and assure public health and safety [and] (d)(1) Findings regarding the conformity of the proposed site and related facilities…with public safety standards…and with other relevant local, regional, state and federal standards, ordinances, or laws…"(Pub. Resources Code, §25523).

SUBJECTS DISCUSSED

Subjects covered in this analysis include:

- Identification of the LORS applicable to facility design;
- Evaluation of the applicant's proposed design criteria, including the identification of those that are essential to ensuring protection of the environment and public health and safety;
- Proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable LORS;
- Identification of the Energy Commission's design review and construction inspection process, which is used to ensure compliance with applicable LORS and protection of the environment and public health and safety; and

- Conditions of certification proposed by staff to ensure that the project will be designed and constructed to comply with all applicable LORS, and protect environmental quality and assure public health and safety.

SETTING

Three Mountain Power, Limited Liability Company (the applicant) proposes to construct and operate the Three Mountain Power Project (TMPP), a 500-megawatt (MW), natural gas fired, combined cycle powerplant. The proposed project will be located approximately one mile northeast of the town of Burney, and 45 miles east of Redding, Shasta County, California. TMPP will occupy approximately 10 acres of a 40-acre site. The power plant site is located in Township 35 North, Range 3 East, on Assessor's Parcel Number 030-390-36.

Approximately one-third of the site is currently developed and used by Burney Mountain Power, which operates a 10 MW biomass-fired powerplant.

TMPP is located in seismic zone 3, the second highest seismic shaking zone in the country. Additional engineering details of the proposed project are contained in the Application for Certification (AFC), in Appendices K and M through R (TMPP 1999a).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The applicable LORS for each engineering discipline, civil, structural, mechanical and electrical, are included as part of the engineering appendices, Appendices M through Q, and summarized in Section 7.3, Table 7.1-1 and Section 8, Engineering (TMPP 1999a). A summary of these LORS includes: Title 24, California Code of Regulations, which adopts the current edition of the California Building Code (CBC) as minimum legal building standards; the 1998 CBC for design of structures; American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code; and National Electrical Manufacturers Association (NEMA) standards.

ANALYSIS

The basis of this analysis is the applicant's proposed analysis methods, construction methods and list of LORS and design criteria set forth in the AFC. Applicable engineering sections include:

Section 1.2	Project Schedule
Section 1.3	Project Ownership
Section 2	Facility Description and Location
Section 2.2	Transmission Line Description
Section 7	Laws, Ordinances, Regulations and Standards (LORS)
Section 7.3	Project Siting, Design and Construction
Section 8	Engineering

Appendices

1. Appendix K — Preliminary Geotechnical Report
2. Appendix M — Foundation and Civil Engineering Design Criteria
3. Appendix N — Structural and Seismic Design Criteria
4. Appendix O — Mechanical Engineering Design Criteria
5. Appendix P — Control Systems Engineering Design Criteria
6. Appendix Q — Electrical Engineering Design Criteria
7. Appendix R — Major Equipment List

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access. Staff has assessed the criteria for designing and constructing linear support facilities such as a natural gas pipeline and electric transmission line. The applicant proposes to use accepted industry standards (see AFC Appendix M for a list of the applicable industry standards), design practices, and construction methods in preparing and developing the site. The applicant's proposed methods follow industry standard practices. Staff concludes that the project, including its linear facilities, will likely comply with all applicable site preparation LORS, and proposes conditions of certification included below to ensure compliance.

MAJOR STRUCTURES, SYSTEMS AND EQUIPMENT

Major structures, systems and equipment are defined as those structures and associated components or equipment that are necessary for power production and are costly to repair or replace, or that require a long lead time to repair or replace, or those used for the storage, containment, or handling of hazardous or toxic materials. Major structures and equipment are listed in the conditions of certification (**GEN-2** below).

The AFC contains a list of the civil, structural, mechanical and electrical design criteria that demonstrate the likelihood of compliance with applicable LORS, and which staff believes are essential to ensuring that the project is designed in a manner that protects the environment and public health and safety.

PROPOSED MODIFICATIONS

The AFC (TMPP 1999a, Section 8, Appendices M and N) identifies applicable LORS that are applicable to the project. The project should be designed and constructed to the 1998 edition of the CBC, and other applicable codes and standards in effect at the time design and construction of the project actually commence. In the event the design of TMPP is submitted to the Chief Building Official (CBO)[1] for review when the successor to the 1998 CBC is in effect, the 1998 CBC provisions, identified herein, shall be replaced with the applicable successor provisions.

[1]The CBO is the CEC's duly appointed representative, who may be the City or County Chief Building Official, or other appointed representative.

CBC LATERAL FORCE REQUIREMENTS

The procedures and limitations for the seismic design of structures by the 1998 CBC are determined considering seismic zoning, site characteristics, occupancy, structural configuration, structural system and height. Different design and analysis procedures are recognized in the 1998 CBC for determining seismic effects on structures. The dynamic lateral force procedure of Section 1631 is always acceptable for design. The static lateral force procedure of Section 1630 is allowed under certain conditions of regularity, occupancy and height determined under Section 1629. Nonbuilding structures are included in Section 1634. Most of the structures in powerplant projects are considered nonbuilding structures.

STATIC LATERAL FORCE PROCEDURE

In seismic Zones 3 and 4, the static lateral force procedure of Section 1630 may be used for the following:

1. Regular structures under 240 feet in height with lateral force resistance provided by systems, listed in Table 16-N, except where Section 1629.8.4, Item 4, applies. (Structures, regular or irregular, located on Soil Profile Type S_F, that has a period greater than 0.7 second require dynamic analysis.)

2. Irregular structures not more than five stories or 65 feet in height.

DYNAMIC LATERAL FORCE PROCEDURE

In seismic zones 3 and 4, the dynamic lateral force procedure of Section 1631 shall be used for all other structures, including the following:

1. Structures having a stiffness, weight or geometric vertical irregularity of Type 1, 2 or 3, as defined in Table 16-L, or structures having irregular features not described in Table 16-L or 16-M, except as permitted by Section 1630.4.2. (Where a combination of structural systems is included in the same structure, the structure can be analyzed as two independent structures for purposes of determining regularity.)
2. Structures over five stories or 65 feet, not having the same structural system throughout their height except as permitted by Section 1631.2. (An elastic design response spectrum constructed in accordance with Figure 16-3 of the 1998 CBC, using the values of C_a and C_v consistent with the specific site can be used.)
3. Structures, regular or irregular, located on Soil Profile Type S_F, that have a period greater than 0.7 seconds.

RIGID STRUCTURES LATERAL FORCE DESIGN

Rigid structures (those with a fundamental period less than 0.06 second) and their anchorage shall be designed using procedures consistent with the requirements of Section 1634.3 and any other applicable provisions of Section 1634.

TANKS WITH SUPPORTED BOTTOMS

Flat bottom tanks or other tanks with supported bottoms founded at or below grade shall be designed consistent with Section 1634.4 and any other applicable provisions of Section 1634.

OTHER NONBUILDING STRUCTURES

Nonbuilding structures not covered by Sections 1634.3 and 1634.4 shall be designed consistent with the requirements of Section 1634.5 and any other applicable provisions of Section 1634.

ENSURING THE APPROPRIATE LATERAL FORCE PROCEDURE

In order to ensure that structures are analyzed using the appropriate lateral force procedure, staff has included Proposed Condition of Certification **STRUC-1** below, which in part requires review and approval by the CBO of the project owner's proposed lateral force procedures prior to the start of construction.

CIVIL/STRUCTURAL FEATURES

The TMPP will consist of two combustion turbine generators (CTGs), two heat recovery steam generators (HRSGs), one steam turbine generator (STG) and one condenser. The balance of plant (BOP) will include a 500,000 gallon pretreatment water storage tank, 150,000 gallon demineralized water storage tank, a wet cooling tower, a 10,000 gallon aqueous ammonia storage tank, control and administrative buildings, and feedwater pumps.

The applicant proposes, and staff concurs that small, lightly loaded structures, not subject to vibratory loading be supported on shallow footings or mat foundations on properly compacted fill or undisturbed native soils. Foundation depth should extend to at least 12 inches below lowest adjacent grade. If any portion of the foundation bears on bedrock, the entire foundation should be deepened to bear on bedrock. Large, heavily loaded structures, and structures subjected to vibratory loading, should be constructed on deepened foundations that bear on bedrock. Such foundations may include deepened footing or concrete reinforced pier and grade beams. The power plant and related facilities shall be designed to meet the seismic requirements of the latest edition of the California Building Code.

A new substation is proposed to be constructed on-site. Approximately 2,600 feet of a new transmission line connecting the new substation to the existing PG&E 230 kilovolt (kV) transmission system will also be constructed. PG&E will operate both the new substation and the new transmission line.

MECHANICAL SYSTEMS

The power island will consist of two CTGs, two HRSGs, and one STG in a "2-on-1" configuration. Each CTG will produce approximately 170 MW of electricity at site conditions. Power will be generated by the CTGs at 18 kV and stepped up by two transformers to 230 kV.

Exhaust gas from each CTG will flow directly through a HRSG with duct burner and SCR, before passing through the exhaust stack. Up to 230 MW of additional power will be produced by the steam turbine at standard conditions. The duct firing option is provided on the HRSG to allow for added steam production during the hot summer months.

The CTGs will be equipped with dry low nitrogen oxide (NO_X) combustors used to control NO_X. The HRSG will be equipped with a selective catalytic reduction (SCR) system, utilizing aqueous ammonia, and associated support equipment.

Other features of the project include: water and wastewater treatment equipment; pressure vessels, piping systems and pumps; aqueous ammonia storage, handling and piping system; air compressors; fire protection systems; and heating, ventilation, air conditioning (HVAC), potable water, plumbing and sanitary sewage systems.

MECHANICAL LORS AND DESIGN CRITERIA

The application (TMPP 1999a, Appendix O) lists and describes the mechanical codes, standards and design criteria that will be employed in project design documents, procurement specifications and contracts. Design work will be performed in accordance with the appropriate LORS. This list indicates that the applicant is aware of the codes, standards, and design criteria appropriate for such a project. This approach will likely assure the project's mechanical systems are designed to the appropriate codes and standards. Staff has proposed conditions of certification (**MECH-1** through **MECH-4**, below) to monitor compliance with this requirement.

ELECTRICAL SYSTEMS

Major electrical features of the project other than transmission include generators, power control wiring, protective relaying, grounding system, cathodic protection system and site lighting (TMPP 1999a, Appendix Q).

1. Power and Control Wiring. In general, conductors will be insulated based on a normal maximum conductor temperature of 90ºC in 40ºC ambient air with a maximum emergency overload temperature of 130ºC and a short circuit temperature of 250ºC. In areas with higher ambient temperatures, larger conductors will be used or higher temperature rated insulation will be selected.
2. Protective Relaying. These relays protect equipment in the auxiliary power supply system, generator terminal systems, 230 kV system, 4.16 kV systems, turbine-generator system, and the electrical loads powered from these systems. The protective relaying scheme will be designed to remove or alarm any of the abnormal occurrences.
3. Classification of Hazardous Areas. Areas where flammable and combustible liquids, gases, and dusts are handled and stored will be classified for determining the minimum criteria for design and installation of electrical equipment to minimize the possibility of ignition. The criteria for determining the appropriate classification are specified in Article 500 of the National

Electrical Code's National Fire Protection Association/American National Standards Institute (NFPA/ANSI), Section C1.

4. Grounding. The station grounding system will be an interconnected network of bare copper conductors and copper clad ground rods. The system will be provided to protect plant personnel and equipment from hazard, which can occur during power system faults and lightning strikes. The station-grounding grid will be designed for adequate capacity to dissipate heat from ground current under the most severe conditions in areas of high ground fault current concentrations.
5. Site Lighting. The site lighting system will provide personnel with illumination for the performance of general yard tasks, safety, and plant security. Power used to supply outdoor roadway and area lighting will be 277 volts.
6. Freeze Protection. A freeze protection system will be provided for selected outdoor piping as required. Parallel circuit type heating cable will be utilized where possible.
7. Cathodic Protection System. Cathodic protection and other corrosion control measures for all plant structures, including the exterior surface of underground piping and bottoms of surface mounted steel tanks will be provided as required.

The AFC (TMPP 1999a, Appendix Q) lists and describes the electrical codes, standards and design criteria that will be employed in project design documents, procurement specifications and contracts. Design work will be performed in accordance with the appropriate LORS. This list indicates that the applicant is aware of the codes, standards, and design criteria appropriate for such a project. This approach will likely assure the project's electrical systems are designed to the appropriate codes and standards.

Staff concludes that the applicant can design the electrical systems in accordance with all LORS and in a manner which protects the environment and public health and safety by complying with the applicable LORS and electrical design criteria (TMPP 1999a, Appendix Q). Staff has proposed conditions of certification (**ELEC-1** and **ELEC-2**, below) to monitor this compliance.

ANCILLARY FACILITIES

NATURAL GAS SUPPLY LINE

A new 12-inch diameter natural gas supply line will deliver approximately 200,000 cubic feet per day of natural gas from the PG&E natural gas transmission line to the proposed project site. Three alternate routes for this supply line are discussed in detail in the AFC (TMPP 1999a § 5.1.3).

EMISSION CONTROLS

NOx emissions from the combustion process will be reduced to 2.5 parts per million by volume dry (ppmvd), or less, at 15 percent oxygen, by utilizing dry low NOx

combustion technology and a SCR system. The SCR system will use aqueous ammonia for the reduction process.

WATER SUPPLY PIPELINE

A new 24-inch diameter and 1-mile long water line will deliver about 2,300 gallons per minute (gpm) of water from the Burney Water District to the powerplant site. The water line will be developed and owned by the Burney Water District.

PROJECT QUALITY PROCEDURES

The AFC (TMPP 1999a, § 8.3.2.9) describes a Project Quality Program that will be used on the project to maximize confidence that systems and components will be designed, fabricated, stored, transported, installed, and tested in accordance with the technical codes and standards appropriate for a powerplant. Compliance with design requirements will be verified through an appropriate program of inspections and audits. Employment of this Quality Assurance/Quality Control (QA/QC) program will ensure that the project is designed, procured, fabricated and installed in accordance with LORS.

COMPLIANCE MONITORING

THE ENERGY COMMISSION'S DESIGN REVIEW AND CONSTRUCTION INSPECTION PROCESS

Under Section 104.2 of the CBC, the building official is authorized and directed to enforce all the provisions of the CBC. For all energy facilities certified by the Energy Commission, the Energy Commission is the building official and has the responsibility to enforce the code. In addition, the Energy Commission has the power to render interpretations of the CBC and to adopt and enforce rules and supplemental regulations to clarify the application of the CBC's provisions.

The Energy Commission's design review and construction inspection process is developed to conform to CBC requirements and ensure that all facility design conditions of certification are met. As provided by Section 104.2.2 of the CBC, the Energy Commission appoints experts to carry out the design review and construction inspections and act as delegate CBO on behalf of the Energy Commission. These delegate agents typically include the local building official and independent consultants hired to cover technical expertise not provided by the local official. The applicant, through permit fees as provided by CBC Sections 107.2 and 107.3, pays the costs of the reviews and inspections. While building permits in addition to the Energy Commission certification are not required for this project, in lieu permit fees are paid by the applicant consistent with CBC Section 107, to cover the costs of reviews and inspections.

Engineering and compliance staff has completed, or will complete, the following to ensure the design review and construction inspection process is consistent with the applicant's timing of the project:

1. Staff has met with the local building department to discuss the Energy Commission compliance process and the potential involvement of the local building official as delegate agent.
2. Staff will propose an MOU with Shasta County outlining the roles and responsibilities of the County and its subcontractors as delegate agents appointed by the Energy Commission to ensure compliance with the CBC and facility design conditions of certification.
3. Staff will meet with the County and its subcontractor (if applicable) to discuss the details of the design review and construction inspection process, fees, types of submittals required of the process and timing of the review.

Staff has developed conditions of certification (see the section below, titled "Proposed Conditions of Certification") to ensure compliance with LORS and protection of the environment and public health and safety. Some of these facility design conditions address the roles, responsibilities and qualifications of TMPP's engineers responsible for the design and construction of the project (proposed conditions of certification **GEN-1** through **GEN-8**). Engineers responsible for the design of the civil, structural, mechanical, and electrical portions of the project are required to be registered in California, and to sign and stamp each submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that no element of construction proceed without approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility with construction activities, these conditions are written to require that no element of construction of permanent facilities, which is difficult to reverse, may proceed without approval of plans from the CBO. For those elements of construction that are not difficult to reverse and are allowed to proceed without approval of the plans, the applicant shall have the responsibility to fully modify those elements of construction to comply with all design changes that result from the CBO's plan review and approval process.

APPLICANT'S COMMENTS ON PSA

In their January 7, 2000 comments on staff's PSA, the applicant requested that the CPM be required to approve or reject compliance submittals within 15 days; otherwise, submittals are assumed to be approved.

Note that, with only one exception,[2] the Conditions of Certification following this section do not require staff, through the CPM, to approve anything. Rather, approvals by the Chief Building Official (CBO) are required, with only notification to the CPM. These approvals are required by law (principally the California Building Code); staff could not recommend circumventing these approval requirements. Allowing work to proceed without the requisite CBO approval leaves open the

[2] **GEN-9** requires CPM approval of the Decommissioning Plan. This would occur only when the plant is to be shut down; it cannot affect project construction.

possibility of violation of LORS, of unsafe construction, or of significant unmitigated adverse impacts on the environment.

The majority of submittals to the CBO allow a thirty day turnaround time. It is staff's experience, from numerous previous power plant projects, that this is the minimum period of time that allows the CBO's comments to be incorporated into project designs before construction proceeds. Any shorter period would likely lead to construction delays, or to construction proceeding without the CBO's approval.

FACILITY CLOSURE

A facility closure was evaluated under three scenarios; Planned Closure, Unexpected Temporary Closure and Unexpected Permanent Closure.

PLANNED CLOSURE

The removal of a facility from service, or decommissioning, as a result of the project reaching the end of its useful life, may range from "mothballing" to removal of all equipment and appurtenant facilities. Future conditions that may affect the decommissioning Decision are largely unknown at this time.

In order to assure that decommissioning of the facility will be completed in a manner that is environmentally sound, safe, and will protect public health and safety, the applicant shall submit a decommissioning plan to the Energy Commission and Shasta County for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of the following items:

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

UNEXPECTED TEMPORARY CLOSURE

Under this scenario, it is expected that the facility is closed unexpectedly, on a short-term basis. Natural disasters, such as an earthquake or severe storm, can cause an unexpected temporary closure of the facility. If damage to the facilities is too great, the temporary closure may become permanent.

If the facility is closed on a temporary basis, the applicant shall secure the site in order to protect public health and safety. If temporary closure becomes permanent, the applicant shall follow the "Planned Closure" procedures outlined in the Planned Closure.

UNEXPECTED PERMANENT CLOSURE

Under this scenario, the project owner closes the facility unexpectedly on a permanent basis. In this case, the project owner shall implement the closure procedures outlined above for "Planned Closure".

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. To ensure that these measures are included in the Facility Closure Plan, staff has proposed a Condition of Certification (**GEN-9**) to ensure that these measures are included in the Facility Closure Plan.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. The laws, ordinances, regulations, and standards (LORS), identified in the AFC and supporting documents, are those applicable to the project.
2. Staff has evaluated the AFC, and the project LORS and design criteria in the record. Staff concludes that the design, construction and eventual closure of the project are likely to comply with applicable LORS. If properly implemented, design criteria, including staff proposed modifications, will ensure that LORS are met during the project design and construction phases.
3. The conditions of certification proposed will ensure that the proposed facilities are designed, constructed, operated, and eventually closed in accordance with applicable LORS. This will occur through the use of design review, plan checking and field inspections, which are to be performed by the local CBO or other commission delegate agent. Staff will audit the CBO to ensure satisfactory performance.
4. The Energy Commission design review and construction inspection process will be in place for the project and will allow construction to start as scheduled if the project is certified. The process will provide the necessary reviews to ensure compliance with applicable facility design LORS and conditions of certification.
5. Whereas future conditions that may affect decommissioning are largely unknown at this time, it can reasonably be concluded that if the project owner submits a decommissioning plan required by **GEN-9**, prior to the commencement of decommissioning, that the decommissioning procedure is likely to result in satisfactory decommissioning performance.

RECOMMENDATIONS

If the Energy Commission certifies the project, staff recommends that:

1. The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to comply with applicable LORS, and also to protect environmental quality, and assure public health and safety;

2. The project be designed and built to the 1998 CBC (or successor standard, if such is in effect); and
3. The CBO review the final designs, conduct plan checking and perform field inspections during construction, and staff audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct and inspect the project in accordance with the 1998 California Building Code (CBC)[3] and all other applicable LORS in effect at the time initial design plans are submitted to the CBO for review and approval. The CBC in effect is that edition that has been adopted by the California Building Standards Commission and published at least 180 days previously.

Protocol: In the event that the TMPP is submitted to the CBO when a successor to the 1998 CBC is in effect, the 1998 CBC provisions identified herein shall be replaced with the applicable successor provisions. *Where, in any specific case, different sections of the code specify different materials, methods of construction, or other requirements, the most restrictive shall govern.* Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

Verification: Within 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) after receipt of the Certificate of Occupancy, the project owner shall submit to the California Energy Commission Compliance Project Manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable LORS and the Energy Commission's Decision have been met for facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [1998 CBC, Section 109 – Certificate of Occupancy.]

GEN-2 The project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List, and a Master Specifications List. 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 structures and equipment in **Table 1: Major Equipment List** below). To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

[3] The Sections, Chapters, Appendices and Tables, unless otherwise stated, refer to the Sections, Chapters, Appendices and Tables of the 1998 California Building Code (CBC).

Table 1: Major Equipment List

Quantity*	Description	Size/Capacity*	Remarks
2	CTG – Combustion Turbine	172.5 MW	
2	CTG – Generator Assemblies	187.0 MW	220 MVA/0.85 PF
2	CTG Evaporative Cooler Packages	37-43.5 gpm	Evaporative Media
1	STG – Steam Turbine	220 MW	
1	STG – Generator Assemblies	187 MW	220 MVA/0.85 PF
1	Surface Condenser	1,305.76 MMBtu/hr	2 Pass/ ~150,000 ft^2
1	Induced Draft Cooling Tower	1,250 MMBtu/hr	Counterflow 125,000 gpm/DT=20°F
2	HRSG – Heat Recovery Steam Generators	126'5"x28'8"	3 Pressure levels / Reheat /1,800 psig
2	HRSG – Stack w/ CEM	17'-6" Ø x 140' high	
2	Aqueous Ammonia (NH_3) Vessels	10,000 gallons	19% solution
1	Pretreatment Water Storage Tank	500,000 gallons	
1	Demineralized Water Storage Tank	150,000 gallons	
1	Condensate Storage Tank	75,000 gallons	
1	Neutralization Storage Tank	75,000 gallons	
2	Circulating Water Pumps	57,750 gpm	1,800 hp ea.
2	Auxiliary Water Pumps	15,000 gpm	600 hp ea.
2	Hotwell Condensate Pumps	2,185 gpm	200 hp ea.
6	HP/IP BFW Pumps	2,150 gpm	3,400 hp ea.
3	18kV/230kV Gen. Step-up XFMR		
2	18kV/4160 V Aux. XFMR		
4	230 kV Circuit Breakers		

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

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

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

Verification: The project owner shall make the required payments to the CBO at the time of submittal of the plans, design calculations, specifications, or soil reports. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fee has been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project

[Building Standards Administrative Code (Cal. Code Regs., tit. 24, § 4-209, Designation of Responsibilities).]

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

Protocol: The RE shall:

1. Monitor construction progress to ensure compliance with LORS;

2. Ensure that construction of all the facilities conforms in every material respect to the applicable LORS, these Conditions of Certification, approved plans, and specifications;

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

4. Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;

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

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

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

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

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

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

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; D) a mechanical engineer; and E) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.]

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

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

Protocol: A: The civil engineer shall:

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

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

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

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

2. Prepare the soils engineering reports required by the 1998 CBC, Appendix Chapter 33, Section 3309.5 – Soils Engineering Report, and Section 3309.6 – Engineering Geology Report;

3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 1998 CBC, Appendix Chapter 33, section 3317, Grading Inspections;

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

5. Review the geotechnical report, field exploration report, laboratory tests, and engineering analyses detailing the nature and extent of the site soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load; and

6. Prepare reports on foundation investigation to comply with the 1998 CBC, Chapter 18 section 1804, Foundation Investigations.

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

Protocol: C: The design engineer shall:

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

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

3. Monitor construction progress to ensure compliance with LORS;

4. Evaluate and recommend necessary changes in design; and

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

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

Protocol: E: The electrical engineer shall:

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

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

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

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

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section, 1701.5 Type of Work (requiring special inspection), and Section 106.3.5, Inspection and observation program.

Protocol: The special inspector shall:

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

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

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

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

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

Verification: At least 15 days prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.

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

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

Verification: The project owner shall submit monthly construction progress reports to the CBO and CPM. The project owner shall transmit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. When the work and the "as-built" and "as graded" plans conform to the approved final plans, the project owner shall notify the CPM regarding the CBO's final approval. The marked up "as-built" drawings for the construction of structural and architectural work shall be submitted to the CBO. Changes approved by the CBO shall be identified on the "as-built" drawings [1998 CBC, Section 108, Inspections.]

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans.

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

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

1. The proposed closure/decommissioning activities for the project and all appurtenant facilities constructed as part of the project;

2. All applicable LORS, all local/regional plans, and a discussion of the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;

3. Activities necessary to restore the site if the TMPP decommissioning plan requires removal of all equipment and appurtenant facilities; and

4. Closure/decommissioning alternatives, other than complete restoration of the site.

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

CIVIL-1 Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;

3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and

4. Soils report as required by the 1998 CBC, Appendix Chapter 33, Section 3309.5, Soils Engineering Report and Section 3309.6, Engineering Geology Report.

Verification: At least 15 days prior to the start of site grading, the project owner shall submit the documents described above to the CBO for review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area. [1998 CBC, Section 104.2.4, Stop orders.]

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

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

If, in the course of inspection, it is discovered that the work is not being done in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action, and send copies to the CBO and the CPM.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a Non-Conformance Report (NCR), and the proposed corrective action. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following Monthly Compliance Report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage facilities, the project owner shall obtain the CBO's approval of the final "as-graded" grading plans, and final "as-built" plans for the erosion and sedimentation control facilities [1998 CBC, Section 109, Certificate of Occupancy.]

Verification: Within 30 days of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall submit to the CBO the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of this report to the CPM in the next Monthly Compliance Report.

STRUC-1 Prior to the start of any increment of construction, the project owner shall submit to the CBO for review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for:

1. Major project structures;

2. Major foundations, equipment supports and anchorage;

3. Large field fabricated tanks;

4. Turbine/generator pedestal; and

5. Switchyard structures.

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

Protocol: The project owner shall:

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

2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications [1998 CBC, Section 108.4, Approval Required];

3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures at least 90 days (or a lesser number of days mutually agreed to by the project owner and the CBO), prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation [1998 CBC, Section 106.4.2, Retention of plans and Section 106.3.2, Submittal documents.]; and

4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations and specifications shall be signed and stamped by the responsible design engineer [1998 CBC, Section 106.3.4, Architect or Engineer of Record.]

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of construction, the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

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

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

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

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

2. Concrete pour sign-off sheets;

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

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

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

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

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

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 1998 CBC, Chapter 1, Section 106.3.2, Submittal documents, and Section 106.3.3, Information on plans and specifications, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give the CBO prior notice of the intended filing.

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

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in Chapter 3, Table 3-E of the 1998 CBC shall, at a minimum, be designed to comply with Occupancy Category 2 of the 1998 CBC. Chapter 16, Table 16–K of the 1998 CBC requires use of the following seismic design criteria: $I = 1.25$, $I_p = 1.5$ and $I_W = 1.15$.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of installation of the tanks or vessels containing the above specified quantities of highly toxic or explosive substances that would be hazardous to the safety of the general public if released, the project owner shall submit to the CBO for review and approval, final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

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

MECH-1 Prior to the start of any increment of piping construction, the project owner shall submit, for CBO review and approval, the proposed final design drawings, specifications and calculations for each plant piping system (exclude domestic water, refrigeration systems, and small bore piping, i.e., piping and tubing with a diameter less than two and one-half inches). The submittal shall also include the applicable QA/QC procedures. The project owner shall design and install all piping, other than domestic water, refrigeration, and small bore piping to the applicable edition of the CBC. Upon completion of construction of any piping system, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 106.3.2, Submittal documents, Section 108.3, Inspection Requests.]

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

1. The proposed final design plans, specifications and calculations conform with all of the piping requirements set forth in the Energy Commission's Decision; and

2. All of the other piping systems, except domestic water, refrigeration systems and small bore piping have been designed, fabricated and installed in accordance with all applicable ordinances, regulations, laws and industry standards, including, as applicable:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI B31.2 (Fuel Gas Piping Code);
- ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31.8 (Gas Transmission and Distribution Piping Code); and
- Specific City/County code.

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

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of piping construction, the project owner shall submit to the CBO for approval, with a copy of the transmittal letter to the CPM, the above listed documents for that increment of construction of piping systems, including a copy of the signed and stamped engineer's certification of conformance with the Energy Commission's Decision. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation [1998 CBC, Section 108.3 – Inspection Requests.]

The project owner shall:

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

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

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for review and approval, final design plans, specifications and calculations, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

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

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

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the applicable edition of the CBC. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS [1998 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record.]

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, with a copy of the transmittal letter to the CPM.

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

MECH-4 Prior to the start of each increment of plumbing construction, the project owner shall submit for CBO's approval the final design plans, specifications, calculations, and QA/QC procedures for all plumbing systems, potable water systems, drainage systems (including sanitary drain and waste), toilet rooms, building energy conservation systems, and temperature control and ventilation systems, including water and sewer connection permits issued by the local agency. Upon completion of any increment of construction, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 108.3, Inspection Requests, Section 108.4, Approval Required.]

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

1. Plumbing, potable water, all drainage systems, and toilet rooms in accordance with Title 24, California Code of Regulations, Division 5, Part 5 and the California Plumbing Code (or other relevant section(s) of the currently adopted California Plumbing Code and Title 24, California Code of Regulations); and

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

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

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any of the above systems, the project owner shall submit to the CBO the final design plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the next Monthly Compliance Report following completion of that increment of construction.

ELEC-1 For the 480 volts and higher systems, the project owner shall not begin any increment of electrical construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [1998 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests.]

Protocol: 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 electrical

construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for electrical equipment and systems 480 volts and greater, including a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

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

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

B. Final plant calculations to establish:
   1. short-circuit ratings of plant equipment;
   2. ampacity of feeder cables;
   3. voltage drop in feeder cables;
   4. system grounding requirements;
   5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
   6. system grounding requirements;
   7. lighting energy calculations; and
   8. other reasonable calculations as customarily required by the CBO.

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

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical equipment installation, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations, for electrical equipment and systems 480 volts and greater enumerated above, including a copy of the signed and stamped statement from the responsible electrical engineer certifying compliance with the applicable LORS. The project owner shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

REFERENCES

TMP, LLC. 1999a. Application for Certification, Three Mountain Power Project (99-AFC-2). Submitted to the California Energy Commission, March 3, 1999.

TMP, LLC, 1999b. Responses to Energy Commission Staff's Data Requests. September 1, 1999.

TMP, LLC, 1999c. Additional Information for its Application for Certification, Three Mountain Power Plant Project, Submitted to the California Energy Commission, June 3, 1999.

POWER PLANT RELIABILITY

Testimony of Steve Baker

INTRODUCTION

In this analysis, staff addresses the reliability issues of the project to determine if the power plant is likely to be built in accordance with typical industry norms for reliability of power generation. Staff uses this level of reliability as a benchmark because the resulting project would likely not degrade the overall reliability of the electric system it serves.

The scope of this power plant reliability analysis covers:

- Equipment availability;
- Plant maintainability;
- Fuel and water availability; and
- Power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While Three Mountain Power, LLC (the applicant) has predicted a level of reliability for the power plant (see below), staff believes the applicant should not be held responsible for achieving this goal, so long as the plant's reliability matches or exceeds that of similar plants.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Presently, there are no laws, ordinances, regulations or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the commission must make findings as to the manner in which the project is to be designed, sited and operated to ensure safe and reliable operation (Cal. Code Regs., tit. 20, § 1752(c)). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if the project exhibits reliability at least equal to that of other power plants on that system.

SETTING

In the regulated monopoly electric industry of past decades, the utility companies assured overall system reliability, in part, by maintaining a "reserve margin." This amounted to having on call, at all times, sufficient generating capacity, in the form of standby power plants, to quickly handle unexpected outages of generating or transmission facilities. The utilities generally maintained a seven- to ten-percent reserve margin, meaning that sufficient capacity was on call to quickly replace from seven to ten percent of total system resources. This margin proved adequate, in part because of the reliability of the power plants that constituted the system.

Now, in the newly restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the California Independent System Operator (Cal-ISO), a newly-formed entity that will work with the California Power Exchange (PX) to purchase, dispatch and sell electric power throughout the state. How Cal-ISO will ensure system reliability is only now being determined; protocols are being developed and put in place that will, it is anticipated, allow sufficient reliability to be maintained under the competitive market system. "Must-run" power purchase agreements and "participating generator" agreements are two mechanisms currently being considered to ensure an adequate supply of reliable power (Mavis 1998, pers. comm.).

The Cal-ISO also requires those power plants selling ancillary services, as well as those holding reliability must-run contracts, to fulfill certain requirements, including:

- filing periodic reports on plant reliability;
- reporting all outages and their causes; and
- scheduling all planned maintenance outages with the Cal-ISO (Detmers 1999, pers. comm.).

The Cal-ISO's mechanisms to ensure adequate power plant reliability apparently are being devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, there is cause to believe that, under free market competition, financial pressures on power plant owners to minimize maintenance expenditures will act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants exhibit individual reliability sufficiently lower than this historical level, the assumptions used by Cal-ISO to ensure system reliability will prove invalid, with potentially disappointing results. Until the restructured competitive electric power system has undergone a shakeout period, and the effects of varying power plant reliability are understood and compensated for, staff deems it wise to encourage power plant owners to continue to build and operate their projects to the level of reliability to which all in the industry have become accustomed.

The applicant proposes to operate the Three Mountain Power Project (TMPP) as a 500 MW baseload unit, selling energy and capacity to wholesale customers and to the market via the PX while operating at an overall annual availability factor between 90 and 95 percent (TMP 1999a, AFC §§ 2.1, 8.3.2; Table 2.1-1). The applicant mentions no plans to sell reliability-related power services.

ANALYSIS

A reliable power plant is one that is available when called upon to operate. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability, fuel and water availability, and resistance to natural hazards. Staff examines these factors for the TMPP and compares them to industry

norms. If they compare favorably, staff can conclude that the TMPP will not degrade utility system reliability.

Throughout its intended life, the project will be expected to perform reliably in baseload duty. Power plant systems must be able to operate for extended periods (sometimes months on end) without shutting down for maintenance or repairs. This requirement for equipment availability is typically addressed by control of quality in machinery design, construction, and installation. Plant reliability is further assured by providing for plant maintainability and sufficient redundancy of critical equipment, fuel and water availability, and resistance to natural hazards.

EQUIPMENT AVAILABILITY

Equipment availability will be ensured by use of appropriate quality assurance/quality control (QA/QC) programs during design, procurement, construction and operation of the plant, and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

QA/QC PROGRAM

The QA/QC program delineated by the applicant (TMP 1999a, AFC § 8.3.2.9) describes a program typical of the power industry. Equipment and supplies will be purchased from qualified suppliers, suppliers' capabilities will be evaluated, purchased equipment will be inspected upon receipt, and construction and installation will be inspected and tested, all in accordance with the QA plan. Staff expects implementation of this program to yield typical reliability of design and construction. To ensure such implementation, staff has proposed appropriate conditions of certification under the portion of this document entitled **Facility Design**.

PLANT MAINTAINABILITY

EQUIPMENT REDUNDANCY

A generating facility called on to operate in baseload service for long periods of time must be capable of being maintained while operating. A typical approach for achieving this is to provide redundant examples of those pieces of equipment most likely to require service or repair.

The applicant plans to provide some redundancy of function (TMP 1999a, AFC §§ 2.1.2.1.5, 2.1.2.1.11, 2.1.2.3.2, 8.3.2.7, 8.3.2.8). For example:

- The following plant components are provided in sets of two 100 percent capacity units:

  — HRSG feedwater pumps;
  — condensate pumps;
  — auxiliary cooling water pumps;
  — air compressors; and
  — the demineralizer system.

- The following plant components are provided in a set of two 55 percent capacity units:

  — circulating water pumps.

- The computerized control and protective system for the gas turbine generators and HRSGs, known as the Distributed Control and Information System (DCIS), will exhibit typical redundancy.

While some power plants may exhibit greater levels of equipment redundancy, the fact that the project consists of two parallel trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other train to fail, thus allowing the plant to continue to generate (at reduced output). With this opportunity for continued operation in the face of equipment failure, and in light of the fact that the applicant does not purport to sell system reliability services, staff believes that the equipment redundancy described here represents an adequate design approach for a project such as this.

MAINTENANCE PROGRAM

The applicant proposes to establish a plant maintenance program typical of the industry (TMP 1999a, AFC §§ 2.1.2.3.2, 8.3.2.5, 8.3.2.9.3). In conjunction with an overall plant quality control program (TMP 1999a, AFC § 8.3.2.9), staff expects that this will allow the project to 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 TMPP will burn natural gas from a nearby PG&E interstate pipeline, transmitted to the plant via a new 2,900-foot long, twelve-inch diameter pipeline (TMP 1999a, AFC §§ 1.1.1, 2.1.2.1.6, 2.1.2.5, 8.3.1). The PG&E natural gas system, which provides access to gas from the Northwest and the Southwest, represents a resource of considerable capacity. This system offers access to far more gas than the plant would require (TMP 1999a, AFC Table 2.1-1). 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 TMPP may obtain raw and potable water from the Burney Water District (BWD). The applicant proposes to enter into a long-term agreement with the BWD to supply the project from groundwater resources. The BWD will construct the necessary storage and delivery system, including new 14- and 24-inch diameter pipelines, to serve the project (TMP 1999a, AFC §§ 1.1.1.3, 1.1.4.13, 2.1.1.2.5,

2.1.2.1.7, 2.1.2.1.13, 6.14.1.2, 8.3.2.10). If the applicant cannot reach a satisfactory agreement with BWD, they will drill their own water wells in the same location as the proposed BWD wells (TMP 2000). While this may result in a reliable source of water for the project, there remains a question as to the feasibility of overall water supply and wastewater disposal for the project. Accordingly, staff cannot conclude at this time that a reliable source of water exists. (Please refer to that portion of this document entitled **Soil and Water Resources**.)

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, flooding, tsunamis (tidal waves) and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but seismic shaking (earthquake) presents a credible threat to reliable operation (see that portion of this document entitled **Facility Design**).

SEISMIC SHAKING

The site lies within Seismic Zone 3 (TMP 1999a, AFC § 2.1.1.2.7). The project will be designed and constructed to the latest appropriate LORS. Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking, compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. (Please see that section of this document entitled **Facility Design**.) 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. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

COMPARISON WITH EXISTING FACILITIES

Industry statistics for availability factors (as well as many other related reliability data) are kept by the North American Electric Reliability Council (NERC). NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics on the Internet (http://www.nerc.com). NERC reports the following summary generating unit statistics for the years 1993 through 1997 (NERC 1998):

For Combined Cycle units (All MW sizes)
Availability Factor = 91.10 percent

The General Electric and Siemens-Westinghouse gas turbines that will be employed in the project have been on the market for several years now, and can be expected to exhibit typically high availability. The applicant's prediction of an annual availability factor from 90 to 95 percent (TMP 1999a, AFC § 8.3.2) is quite reasonable compared to the NERC figure for similar plants throughout North America (see above). In fact, these new, large machines can well be expected to outperform the fleet of various gas turbines that make up the NERC statistics. Further, since the plant will consist of two parallel gas turbine generating trains,

maintenance will 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 (TMP 1999a, AFC §§ 2.1.2.3.2, 8.3.2.5). The applicant's estimate of plant availability therefore appears realistic. The stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, cannot impact project reliability. Reliability impacts on the electric system from facility closure, should there be any, are dealt with in that portion of this document entitled **Transmission System Engineering**.

CONCLUSION

The applicant predicts an equivalent availability factor from 90 to 95 percent, which staff believes is achievable in light of the industry norm of 91 percent for this type of plant. Based on a review of the proposal, staff concludes that, if the questions regarding water supply and disposal can be answered satisfactorily, the plant will be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability.

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POWER PLANT EFFICIENCY

Testimony of Steve Baker

INTRODUCTION

The Energy Commission makes findings as to whether energy use by the Three Mountain Power Project (TMPP) 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 TMPP's consumption of energy creates a significant adverse impact, it must determine whether there are any feasible mitigation measures that could eliminate or minimize the impacts. In this analysis, staff addresses the issue of inefficient and unnecessary consumption of energy.

In order to support the Energy Commission's findings, this analysis will:

- determine whether the facility will likely present any adverse impacts upon energy resources;
- determine whether these adverse impacts are significant; and if so,
- determine whether feasible mitigation measures exist that would eliminate the adverse impacts, or reduce them to a level of insignificance.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

No federal laws apply to the efficiency of this project.

STATE

CALIFORNIA ENVIRONMENTAL QUALITY ACT GUIDELINES

CEQA Guidelines state that the environmental analysis "…shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy" (Cal. Code Regs., tit. 14, § 15126.4(a)(1)). Appendix F of the Guidelines further suggests consideration of such factors as the project's energy requirements and energy use efficiency; its effects on local and regional energy supplies and energy resources; its requirements for additional energy supply capacity; its compliance with existing energy standards; and any alternatives that could reduce wasteful, inefficient and unnecessary consumption of energy (Cal. Code regs., tit. 14, § 15000 et seq., Appendix F).

LOCAL

No local or county ordinances apply to power plant efficiency.

SETTING

Three Mountain Power, LLC (the applicant) proposes to construct and operate a (nominal) 500 MW combined cycle power plant to generate baseload power (TMP 1999a, AFC §§ 1.1.1.5, 2.1, 8.4.2). The TMPP will consist of two F-class combustion turbine generators with evaporative inlet air coolers producing approximately 170 MW each, two heat recovery steam generators (HRSGs) with duct burners, and one 230 MW reheat steam turbine generator, totaling approximately 500 MW (TMP 1999a, AFC §§ 2.1.2.1.1, 2.1.2.1.3, 8.4.1; Figure 2.1-4; Appendix S).

ANALYSIS

ADVERSE IMPACTS ON ENERGY RESOURCES

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient and unnecessary consumption of fuel or energy.

PROJECT ENERGY REQUIREMENTS AND ENERGY USE EFFICIENCY

Any power plant large enough to fall under Energy Commission siting jurisdiction will consume large amounts of energy. The TMPP will burn natural gas at a maximum rate exceeding 78 billion Btu per day (TMP 1999a, AFC Fig. 2.1-4; Table 2.1-1). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies.

Under expected project conditions, electricity will be generated at a peak load efficiency of approximately 52.2 percent LHV[1] (TMP 1999a, AFC Table 2.1-1); compare this to the average fuel efficiency of a typical utility company baseload power plant at approximately 35 percent LHV.

ADVERSE EFFECTS ON ENERGY SUPPLIES AND RESOURCES

The applicant has described its source of supply of natural gas for the TMPP (TMP 1999a, AFC §§ 1.1.1.2, 2.1.2.1.6). The project will burn natural gas from a Pacific Gas & Electric (PG&E) interstate pipeline that lies to the southeast of Highway 299. The applicant will buy gas from domestic and Canadian sources through a gas marketer or by contract with producers or supply aggregators. These sources represent far more gas than would be required for a project this size. It is highly

[1] Lower heating value.

unlikely that the TMPP could pose a substantial increase in demand for natural gas in California.

Additional Energy Supply Requirements

Natural gas fuel will be supplied to the project via a new 2,900-foot long, 12-inch diameter pipeline from the existing PG&E interstate pipeline southeast of Highway 299 (TMP 1999a, AFC § 2.1.2.1.13). The natural gas supply system in California is so large and well-established, there is no real likelihood that the TMPP will require development of new sources of energy.

Compliance with Energy Standards

No standards apply to the efficiency of the TMPP or other non-cogeneration projects.

Alternatives to Reduce Wasteful, Inefficient and Unnecessary Energy Consumption

The TMPP 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 TMPP will be configured as a compound-train combined cycle power plant, in which electricity is generated by two gas turbines, and additionally by a reheat steam turbine that operates on heat energy recuperated from the gas turbines' exhaust. By recovering this heat, which would otherwise be lost up the exhaust stacks, the efficiency of any combined cycle power plant is increased considerably from that of either gas turbines or steam turbines operating alone. Such a configuration is well suited to the large, steady loads met by a baseload plant, intended to supply energy efficiently for long periods of time.

The number of turbines further contributes to efficiency at part load. Gas turbine generators operate most efficiently at one particular output level, typically at full load. Whenever desired output is less than full load, the unit must be throttled back. Rather than being forced to throttle back one large turbine, with the consequent reduction in efficiency, the power plant operator will have the option of shutting off one gas turbine. This allows the plant to generate at less than full load while maintaining optimum efficiency, suitable for a plant meant for flexible generation, such as load-following duty. Loads down to 50 percent of full load allow one gas turbine, operating at full load, and the steam turbine to maintain peak efficiency.

Additionally, for further operational flexibility, the HRSGs will be equipped with duct burners, to supply additional steam to the steam turbine generator for power augmentation on hot days (TMP 1999a, AFC §§ 2.1.2.1.1, 2.1.2.1.3, 2.1.2.3.2;

Figure 2.1-4; Table 2.1-1). This increases maximum power output, and extends the range of power output at which the plant can operate at optimum or near optimum efficiency.

Equipment Selection

Modern gas turbines embody the most fuel-efficient electric generating technology available today. The "F-class" gas turbines to be employed in the TMPP represent some of the most modern and efficient such machines now available. The applicant will employ a combined cycle power train from a prominent manufacturer: either the Siemens-Westinghouse 501F, nominally rated in a two-on-one train combined cycle configuration at 546 MW and 55.8 percent efficiency LHV at ISO[2] conditions; or the General Electric Frame 7FA, another F-class gas turbine nominally rated in a two-on-one train combined cycle at 530 MW and 56.5 percent efficiency at ISO conditions (TMP 1999a, AFC §§ 1.1.1, 2.1.2.1.1, 5.2.2.2.3, 8.3.2; Table 2.1-1; GTW 1998).

A possible alternative is the ASEA Brown-Boveri KA-24, another "F-class" machine. While the KA-24 promises slightly higher fuel efficiency (57.9 percent) (GTW 1998) than the other F-class machines, any differences among the three in actual operating efficiency will be insignificant. Selecting among these machines is thus based on other factors, such as generating capacity, cost, ability to meet air pollution limitations, and commercial availability. The ABB machine, for instance, is available only in one-on-one power trains, with one gas turbine and one steam turbine paired on a single shaft generating a nominal 271 MW (Orsini 1999, pers. comm.). The GE and Siemens-Westinghouse machines, which can be configured more flexibly, offer some advantage here.

Efficiency of Alternatives to the Project

The project objectives include generation of baseload electricity, as market conditions dictate (TMP 1999a, AFC §§ 1.1.1.5, 2.1, 8.4.2).

Alternative Generating Technologies

The applicant addresses alternative generating technologies in its application (TMP 1999a, AFC § 5.2.2). Oil-burning, coal-burning, solar, wind, hydroelectric, biomass and geothermal technologies are all considered. Given the project objectives, location and air pollution control requirements, staff agrees with the applicant that only natural gas-burning technologies are feasible.

Natural Gas-Burning Technologies

Fuel consumption is one of the most important economic factors in selecting an electric generator; fuel typically accounts for over two-thirds of the total operating costs of a fossil-fired power plant (Power 1994). Under a competitive power market system, where operating costs are critical in determining the competitiveness and

[2] International Standards Organization (ISO) standard conditions are 15°C (59°F), 60 percent relative humidity, and one atmosphere of pressure (equivalent to sea level).

profitability of a power plant, the plant owner is thus strongly motivated to purchase fuel efficient machinery.

Capital cost is also important in selecting generating machinery. Recent progress in the development of large, stationary gas turbines, aided by the incorporation into these machines of technological advances made in the development of aircraft jet engines, has created a situation in which several large manufacturers compete vigorously to sell their machines. This, combined with the cost advantages of assembly-line manufacturing, has driven down the prices of these machines. Thus, the power plant developer can purchase a turbine generator that not only offers the best available fuel efficiency, but at the same time sells for the lowest per-kilowatt capital cost.

One possible alternative to an F-class gas turbine is the Siemens-Westinghouse 501G gas turbine generator, which employs partial steam cooling to allow slightly higher temperatures, yielding greater efficiency. While the 501G is rated at 58 percent efficiency, 2.2 percent higher than the 501F, the G machine produces 367 MW to the 501F's 272 MW; a 500 MW power plant would thus not be practical. Instead, a single 501G would yield a 367 MW (nominal) plant, while a dual arrangement would yield a 726 MW plant. Additionally, the 501G is brand new; the first such machine is now in startup at a site in Florida owned by Lakeland Electric and Water (Power 1999). Given the minor efficiency improvement promised by the G-class turbine, the likelihood that the plant will frequently be dispatched at less than full load, and the lack of a proven track record for the 501G, the applicant's decision to purchase "F-class" machines is a reasonable one.

A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler and the chiller; both devices increase gas turbine power output by cooling the gas turbine inlet air. A chiller can offer greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An evaporative cooler boosts power output best on dry days; it uses less electric power than a chiller, thus yielding slightly higher operating efficiency. The applicant plans to install evaporative cooling (TMP 1999a, AFC §§ 2.1.2.1.1, 2.1.2.1.3, 2.1.2.3.2). Given the very dry project climate (TMP 1999a, AFC § 5.2.2.2.4), staff deems this an approach that will yield no adverse energy impacts.

In conclusion, the project configuration (combined cycle) and generating equipment ("F-class" gas turbines) chosen appear to represent the most efficient feasible combination to satisfy the project objectives. There are no alternatives that could significantly reduce energy consumption.

CUMULATIVE IMPACTS

There are no nearby power plant projects that hold the potential for cumulative efficiency impacts when aggregated with the TMPP.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, will not influence, nor will it be influenced by, project efficiency. Any efficiency impacts due to closure of the project would be on the electric system as a whole. Yet the vast size of the electric system serving California, the number of generating plants offering to sell power into it, and the existence of the California Independent System Operator and Power Exchange to ensure the efficient management of the system, all lend assurance that closure of this facility will not produce significant adverse impacts on efficiency.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The TMPP, if constructed and operated as proposed, would generate 500 MW of electric power at an overall project fuel efficiency of approximately 52 percent. While it will consume substantial amounts of energy, it will do so in the most efficient manner practicable. It will not create significant adverse effects on energy supplies or resources, will not require additional sources of energy supply, and will not consume energy in a wasteful or inefficient manner. No energy standards apply to the project. Staff therefore concludes that the TMPP would present no significant adverse impacts upon energy resources.

No cumulative impacts on energy resource are likely. Facility closure would not likely present significant impacts on electric system efficiency.

RECOMMENDATION

From the standpoint of energy efficiency, staff recommends certification of the TMPP. No Conditions of Certification are proposed.

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TRANSMISSION SYSTEM ENGINEERING

Testimony of Laiping Ng and Al McCuen

INTRODUCTION

The Transmission System Engineering (TSE) analysis provides the basis for the findings in the California Energy Commission's (Commission) decision. This final staff analysis (FSA) indicates whether or not the transmission facilities associated with the proposed project conform to all applicable laws, ordinances, regulations and standards (LORS) required for safe and reliable electric power transmission.

The Three Mountain Power, L.L.C. (applicant) proposes to connect their project, the Three Mountain Power Project (TMPP) to Pacific Gas & Electric Company's (PG&E) transmission system. The California Independent System Operator (Cal-ISO) is responsible for ensuring electric system reliability for all participating transmission owning utilities and determines both the standards necessary to achieve reliability and whether a proposed project conforms with those standards. The Energy Commission will rely on the Cal-ISO's determinations to make its finding related to applicable reliability standards, the need for additional transmission facilities, and environmental review of the whole of the project. In this case, staff is primarily a facilitator, coordinating the Cal-ISO's process and results with the certification process and the Energy Commission decision. The Cal-ISO will provide testimony at the Energy Commission's Hearings.

Staff's analysis also evaluates outlet alternatives identified by the applicant and provides proposed conditions of certification to ensure that the project complies with applicable LORS during the design, construction, operation and potential closure of the project.

Public Resources Code Section 25523 requires the Energy Commission to "prepare a written decision…which includes: …findings regarding conformity of the proposed site and related facilities…with public safety standards…and with other relevant local, regional, state, and federal standards, ordinances, and laws." Under the California Environmental Quality Act (CEQA) the Energy Commission must conduct an environmental review of the "whole of an action," which may include facilities ancillary to the project that are not licensed by the Energy Commission (Cal. Code Regs., tit. 14, §15378). Therefore, the Energy Commission makes reasonable attempts to identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities beyond the project's interconnection with the existing transmission system that are required as a result of the power plant addition to the California transmission system.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction," formulates uniform requirements for construction of overhead lines. Compliance with this order

ensures adequate service and safety to persons engaged in the construction, maintenance, operation or use of overhead electric lines and to the public in general.

- CPUC Rule 21 provides standards for the reliable connection of parallel generating stations connected to participating transmission owners.
- Western Systems Coordinating Council (WSCC) Reliability Criteria provides the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria includes the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 "Criteria for Transmission System Contingency Performance" which requires that the results of power flow and stability simulations verify established performance levels. Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas during major disturbances (such as loss of all lines in a right of way). While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).
- North American Electric Reliability Council (NERC) Planning Standards provides policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions, however the NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).
- Cal-ISO Reliability Criteria also provide policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid.
- Cal-ISO Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria. These

standards will be applied the assessment of the system reliability implications of the Three Mountain Power Project. Also of major importance to the TMPP, and other privately funded projects which may sell through the California Power Exchange (Cal-PX) are the Cal-ISO Day/Hour Ahead Inter-zonal Congestion Management Scheduling Protocol (SP 10), the Transmission System Loss Management Scheduling Protocol (SP 4), and the Creation of the Real Time Merit Order Stack (SP 11). The Congestion Management Scheduling Protocol provides that the operation of power plants not violate system criteria when market participants request generation dispatch or the use of major interties. The Real Time Merit Order Stack is developed based on increasing energy bid prices so that the least cost bids are accepted early on and if congestion is anticipated the highest bids are not selected. The Transmission System Loss Management Scheduling Protocol uses the Cal-ISO power flow model to identify the effects on total transmission losses at each generating unit and scheduling point. Additional calculations are performed to the actual net power output required by the generating units meet their scheduled obligations (Cal-ISO 1998b, Cal-ISO 1998c).

- Cal-ISO Participating Generator Agreement consists of detailed explanations of the requirements in the Cal-ISO Tariff pertaining to the paralleled generating unit.

PROJECT DESCRIPTION

The Three Mountain Power Project is a 500 MW generation project and will be located on a 40-acre industrial site that is approximately one mile northeast of the town of Burney, and approximately 45 miles east of Redding, California. Approximately one-third of the site is used by Burney Mountain Power. The TMPP will provide a nominal electrical output of 500 MW for sale into the California electricity market. The project will connect to PG&E's 230 kilovolt (kV) network adjacent to the existing McCloud River Railway right-of-way utilizing a new PG&E 230 kV switchyard via two new double circuit 230 kV lines and a new 230 kV single circuit transmission line from the TMPP switchyard to the PG&E switchyard (TMPP 1999a, AFC pages 2-1, 2-65, Figure 3).

The new PG&E switchyard will be located on the project site Northeast to the new power plant facility. The line connecting the TMPP facility to PG&E's switchyard will be a 230 kV single circuit transmission line, which will connect the two switchyards. The tie-in with the existing PG&E 230 kV Pit River hydro transmission line is approximately 800 feet west and then 1800 feet in a north direction adjacent to the McCloud River easement. The Pit #1-Pit #3 230 kV transmission circuit and the Pit #1-Cottonwood 230 kV transmission circuit will be intersected and looped to the new PG&E switchyard (TMPP 1999b, AFC pages 2-65, 2-73). (See Attachment 3). To accommodate the TMPP power output, 60 linear miles of reconductoring[1] utilizing existing towers to the Round Mountain and Cottonwood substations is proposed.

[1] Reconductoring consists of removing the old insulators, installing new insulators and replacing the old conductors with new conductors with a higher capacity.

EXISTING FACILITIES AND RELATED SYSTEMS

Transmission system engineering Figure 1 and Figure 2 (attached) depict transmission facilities in northern California. While two circuits of the California Oregon Intertie (COI) are shown, the other 500 kV circuit constituting the COI is to the west and is only partially shown. Power flows in northern California are almost always from north to south on the lines shown because of the large amount of native hydro (2000 MW) and imports on the COI. On vary rare occasions power is transported from south to north on the COI.

Attached Figure 2 shows the existing Pit River hydro lines prior to modification to accommodate the TMPP project. Existing facilities in the immediate project area include:

- PG&E Pit #1 – Cottonwood 230 kV transmission circuit
- PG&E Pit #3 – Round Mountain 230 kV transmission circuit
- Burney Mountain Power 10 MW biomass power plant
- Burney Forest Products substation connected to PG&E Pit #1 –Cottonwood 230 kV circuit
- Sierra Pacific Industries substation connected to PG&E Pit #3 230 kV circuit.

ANALYSIS

INTERCONNECTION FACILITIES

Three separate facilities are proposed to provide a reliable connection to PG&E's existing 230 kV lines in the Burney area. These outlet facilities consist of a new single circuit 230 kV transmission line, a new PG&E 230 kV switchyard and two new 230 kV double-circuit steel pole transmission lines to connect to the existing PG&E Pit River hydro unit lines (see Figure 3). To accommodate the power output of the TMPP project, approximately 60 linear miles of PG&E's existing Pit River hydro lines down to the Cottonwood and Round Mountain substation will be reconductored. (See Figure 1 and 3).

SWITCHYARDS

The power plant switchyard is located at the project site. It consists of four circuit breakers and four associated disconnect switches. Power is generated by the facility at 18 kV and stepped up to 230 kV by transformers in the power plant switchyard (TMPP 1999b, AFC page 2-25 Figure 2.1-8).

The new PG&E switchyard is located 1300 feet from the power plant switchyard and will occupy 185 feet by 400 feet of land in an east-west direction. The PG&E switchyard configuration is a double-bus single-breaker station. Five 230 kV circuit breakers, one bus tie breaker for the project and space for four future breakers will be located in the PG&E switchyard (TMPP 1999b, AFC page 2-67).

TRANSMISSION LINES

The TMPP 230 kV line connecting the project switchyard and the PG&E switchyard will be a 1300 feet long single-circuit line with 795 kcmil ACSS conductors. These conductors are rated at 634 MVA, which is adequate to accommodate the maximum output of the TMPP project (530 MW). The connecting lines from the PG&E switchyard to the existing PG&E lines will be approximately 2600 feet long and consist of two double circuit 230 kV steel pole structures. The pole height is 118-foot minimum and the maximum span is 1000 feet. The 795 kcmil conductors have sufficient ampacity to carry the full output of the TMPP project and the area generation with one circuit out of service. The lines will be designed and constructed to comply with General Order 95. (TMPP 1999b, AFC page 2-66).

RECONDUCTORING

The applicant considered two alternatives for interconnecting the TMPP to the existing PG&E transmission system:

1. Loop Pit #1 and Pit #3 230 kV transmission circuits into the new PG&E switchyard. Construct a 1300-foot single-circuit line to the project switchyard, and reconductor the lines from the existing PG&E Pit # 1 and Pit # 3 tower to the Round Mountain and Cottonwood substations (see Figure 3). From the connection point at the existing PG&E line to the Round Mountain substation, both circuits will be reconductored. From the Round Mountain to Cottonwood Substation one circuit will be reconductored and will parallel an existing Western Area Power Administration 230 kV line[2]. The total length of the reconductoring construction is approximately 60 linear miles.

   The reconductoring is accomplished by removing the existing insulator strings, installing new insulator strings and pulling new conductors in shieves (pulleys). Removal and installation of insulator strings is done via helicopter.

   At the Pit River # 3 substation, Sierra Pacific Industries (Burney), Burney Forest Products, Malacha, Round Mountain, and Cottonwood substations existing circuit breakers within the substation's fence line may be replaced as discussed below. The facilities discussed above are considered acceptable subject to approval of the Detailed Facilities Study and implementation of staff's proposed Conditions of Certification.

2. Construct a single circuit 230 kV transmission line from the project substation to either Round Mountain (approximately 19 linear miles[3]) or to the Table Mountain Cottonwood (50 miles) substations (TMPP 1999b, AFC page 2-70).

The applicant selected alternative #1 because alternative #2 adds additional facilities and would pass through National Forest, timberland and pastures.

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[2] This parallel line must be coordinated with the Western Area Power Administration and in accordance with TSE-1f.

[3] In the AFC, the applicant indicated that the distance is 38 miles.

SYSTEM RELIABILITY

INTRODUCTION

A system reliability study, called a Preliminary Facilities Study (or System Impact Study), is performed to determine the effects of connecting a new power plant to the existing electric grid. The study should not only identify impacts but also identify how negative impacts can be eliminated. Any new transmission outlet facilities, or downstream facilities[4], required for connection to the grid are considered part of the project and are subject to the full AFC review process (See Figure 3 for major project facilities). The Cal-ISO has reviewed the Preliminary Facilities Study for the TMPP and has given preliminary approval to the study and the proposed interconnection of the project.

The TMPP applicant indicated in the AFC that it would compete for the use of the existing transmission capabilities and would curtail its generation if necessary.[5] This curtailment -- if it occurs -- may be accomplished by the use of a remedial action scheme (RAS) which decreases power output or trips one or more generating units. The Cal-ISO and staff do not anticipate the need for any mitigation other than the proposed reconductoring of the transmission lines described in the reconductoring section and possible replacement of circuit breakers at substations within the fence line. Additional voltage support may be required as a result of additional studies to be conducted as part of a Detailed Facilities Study (or Facilities Study). Any additional voltage support required would most likely be able to be located within the fence line of existing substations.

The Cal-ISO through a lengthy and involved Stakeholder process determined that responsibility for congestion on transmission facilities caused by a new generator is most appropriately assigned to the new generator. The FERC, based on a perceived flaw rejected this Cal-ISO Tariff amendment and directed the Cal-ISO to reconvene a stakeholder process to develop a solution to this flaw. The Cal-ISO subsequently filed a Request for Rehearing at FERC, and FERC has taken this request under advisement. At this point, is not clear whether FERC will accept the

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[4] Downstream facilities are those that are beyond the point where the line emanating from the power plant joins with the (existing) interconnected system (California Public Utilities Commission v. California Energy Resources Conservation and Development Commission (1984) 150 Cal.App.3d 437, 197 Cal.Rptr. 866)

[5] The Transmission Agency of Northern California is concerned about competing with the TMPP regarding power transport on the COI (TANC 1999b). TANC's issues are of a contractual nature and relate to contracts and operational agreements between PG&E and TANC. Congestion is a necessary outcome of AB 1890 and the ensuing Cal-ISO tariffs that implement restructuring. Staff does not believe this issue is relevant to the findings that the Commission must make or those that the Commission should make because TANC's issues do not concern reliability or environmental impacts. Evaluation of this issue does not add substantively to the hearing record and can only be resolved in a different venue before the Cal-ISO an FERC. Studies to further evaluate potential impacts on TANC in furtherance of discussions between TANC and other stakeholders will be conducted as part of the Detailed Facilities Study. The Detailed Facility Study is anticipated to be available during the latter part of the Commission's licensing process but is not required for identification of facilities required to terminate and operate the TMPP.

Cal-ISO's Tariff as originally filed or they will order a revision of the Tariff to fix the perceived flaw.

Under the filed Tariff amendment, there are six options from which a new generator can choose to satisfy its responsibility to mitigate any incremental congestion it causes. The six options are: 1) upgrading overloaded facilities or constructing new facilities; 2) remedial action schemes (RAS); 3) absorbing the incremental congestion costs created by their new generation; 4) paying others to curtail; 5) self-curtailment; or6) choosing another location.

The applicant, PG&E, and the ISO will develop RAS or other operational solutions that will mitigate congestion caused by the TMPP project. The RAS or operational solutions will be developed in a Detailed Facilities Study, which is subject to Commission approval in the recommended conditions of certification for the project. Completion of the Detailed Facilities Study, the Commission's approval, and the issuance of the Cal-ISO's conclusions and findings regarding the study will assure conformance with NERC, WSCC, and Cal-ISO reliability criteria. The Cal-ISO will provide testimony on the Preliminary Facilities Study and will provide preliminary conclusions and findings at Energy Commission hearings.

SYSTEM RELIABILITY STUDY

A system reliability evaluation determines whether the new project would cause thermal overloads, voltage violations (voltages too high or low), and/or electric system instability (excessive oscillations). In addition to the above analysis, studies may be performed to verify that sufficient reactive power (see Definition of Terms) is available. The reliability evaluation must be conducted for all credible "emergency" conditions. Emergency conditions could include the loss of a single or double circuit line, the loss of a transformer or generator, or a combined loss of these facilities. A Preliminary Facilities Study is conducted in advance of potential system changes, such as the addition of the TMPP into the system, in order to prevent criteria violations. The criteria used in this evaluation include the WSCC Planning Criteria, NERC Planning Standards and applicable Cal-ISO reliability criteria. The reliability implications of the TMPP and the need for additional facilities will be determined by the Cal-ISO based on the Detailed Facilities Study. A preliminary determination of compliance with applicable reliability criteria has been provided by the Cal-ISO (Cal-ISO 1999c, October 5, 1999).

SCOPE OF RELIABILITY STUDIES

The TMPP will have a maximum plant delivery of 530 MW. PG&E performed power flow, short circuit and stability studies with and without insertion of the TMPP into the system to determine conformance with reliability criteria. PG&E study cases include: heavy summer case for 2001, light spring case for 2002, and light winter case for 2002. The assumptions made in these base cases are as follow:

	Heavy Summer (2001)	Light Spring (2002)	Light Winter (2002)
Flow Direction	North to South	North to South	South to North
California-Oregon Transfer	4778 MW	4677 MW	3652 MW
Midway-Vincent Transfer	1493 MW	2139 MW	1247 MW
Pacific DC intertie Transfer	3100MW	1800MW	3100MW
McCloud-Pit Hydro System	97%	97%	93%
Northern Central valley Projects Hydro System	100%	100%	90%
Cow-Battle Creek Hydro System	96%	96%	96%
PG&E System Load	23364	13318	12444

These factors were selected for study to place significant stress on the northern California transmission system to evaluate the effect of inserting TMPP power into the existing system. The study results provide snapshots of highly stressed operation and are not illustrative of month to month or day to day operation[6].

POWER FLOW STUDY RESULTS

The study identified normal and contingency impacts under light spring, heavy summer and light winter conditions. Impacts under normal operating conditions are caused by the addition of TMPP to the system. By interconnecting to the PG&E lines, the TMPP would have the most impact on the Round Mountain - Table Mountain 500 kV lines, Round Mountain 500/230 kV bank, the transmission network's ability to move power from the north to the south during heavy load periods, and from the south to north during light load periods. However, this congestion occurs very infrequently. As stated in footnote 7, historically the levels of COI imports necessary to result in congestion have never occurred in comparison to the 8760 hours of annual operation. Thus, the Burney Resource Group's position that "there will be no net gain in useable generation to the transmission system" (BRG 1999, page 3) is overstated as it assumes that system "snapshots" used to determine reliability can be used to generalize about annual operations. Snapshot cover only a few of the hundreds of operating conditions

[6] Indeed the COI has not operated at 4778 megawatts for one hour during the last three years. Additionally, in 1998 and 1999 The COI on a day to day basis has never been rated at it's theoretical limit of 4800 MW and there were only two partial months when the COI was even rated at 4415 MW. Unless the COI rating exceeds 4415 MW and actual flows in the summer or spring after TMPP exceed that value no congestion will occur. During these day or actually hours, the flow on the COI came nowhere near the rating. While historic imports cannot be used to confidently predict future imports, significant increases in the magnitude and duration of imports would have to occur simultaneously with high native hydro, increased rating of the COI and full output of the TMPP to create substantial congestion.

encountered during annual operation and are deliberately developed to place the system under great stress—not typical operating conditions. For all periods of normal operation[7] (even assuming that native hydro is near maximum) the imports on the COI do not reach 4415 MW and the TMPP -- if called upon to dispatch -- can provide up to 530 MW of useable generation.

CURE has also suggested potential capacity issues related to theoretical COI import reductions under the studied system conditions. They have questioned whether hydro spill at any Pacific Northwest dams would occur as a result of TMPP generation (CURE 1999, page 30). As previously discussed, the number of instances where COI theoretical import reductions would occur appear to be extremely unlikely. Additionally, the duration of such theoretical reductions would likely be of short duration. Hydro generation in Northern California is “must take” if spill conditions are present and would be dispatched ahead of other generation. Finally, with sustained hydro peak capacity of 25,887 MW in the Pacific Northwest (BPA 1999b) and a worst case theoretical curtailment of about 370 MW (about 1.4 percent of the total hydro peak capacity) for the COI it appears that any impact would be speculative and insignificant.

System Impact Under Normal Conditions With The TMPP Project:

As indicated in the table below, the Round Mountain-Table Mountain 500 kV lines and Round Mountain 500/230 kV bank will be overloaded in light spring and light winter cases under normal conditions (TMPP1999, AFC Attachment A page 3). These potential overloads will be precluded by utilizing congestion management techniques.

	Line Voltage	Loaded with TMPP Project
Round Mountain – Table Mountain	500 kV	107% in Heavy Summer and Light Spring
Round Mountain	500/230 kV Bank	123% in Light Winter

System Impact Under Contingency Conditions:

System sensitivity studies under contingency conditions were also analyzed. The studies include: 500 kV line contingencies, 230 kV line contingencies, single generator contingencies, single transformer contingencies, single line plus single generator contingencies, bus outages, breaker failures, double circuit tower line contingencies, and system impact sensitivity for the year of 2006 summer peak.

In the light spring case and the heavy summer case, several 500 kV line outages will cause adverse impacts on the ISO Controlled Grid. The light spring case had overloads for five contingencies and the heavy summer case had overloads for four. Among the five light spring contingencies, two contingencies cause overloads even before addition of the TMPP project. Tripping all three TMPP generators for these two outages reduces the overloads to the levels that occurred before the addition of the TMPP to the grid. The other three contingencies cause overloads only after the

[7] Normal system operation assumes that there are no equipment outages.

TMPP generators are added. However, tripping one of the three TMPP generators will eliminate the overloads for these three contingencies.

Among the four heavy summer contingencies, two contingencies cause overloads even before addition of the TMPP project. Tripping one or more TMPP generators for these two outages reduces the overloads to the levels that occurred before the addition of the TMPP to the grid. The other two contingencies cause overloads only after the TMPP generators are added. However, tripping one of the three TMPP generators will eliminate the overloads for these two contingencies.

Similar situations also apply to the 230 kV line contingencies, single transformer contingencies, bus outages, and breaker failures in both light spring and light winter cases.

The single-line plus single-generator contingencies cause less impact on the system than the single-line outages because outage of a generator reduces stress on the system (since the area where the TMPP is located has more generation than load and loss of a generator would reduce the loading seen on the transmission lines in the area). Therefore, these contingencies were not studied (TMPP 1999, AFC Attachment A, Appendix 1-2).

SHORT CIRCUIT STUDY RESULTS

Short circuit analyses are conducted to assure that existing and proposed breaker ratings are sufficient to withstand high levels of current during a fault (such as when a line touches the ground). The addition of a generation unit to the grid can significantly increase the level of current that flows through circuit breakers. The acceptability of breaker ratings can also be determined during the compliance phase; it need not be done during the AFC process.

A short circuit study was performed for the TMPP. The analysis shows that the project increases stresses to the equipment at the Pit #1, #3, Burney Forest Products, Sierra Pacific Industries, Round Mountain, and Cottonwood substations. The Cal-ISO will make its final determination of whether breakers need to be replaced based on the Detailed Facilities Study that is expected to be received later (TMPP 1999, AFC Attachment A, Appendix 3). Condition of certification (TSE-1b) is recommended to ensure that breaker ratings will be adequate to interrupt post-project fault currents.

STABILITY STUDY RESULTS

Stability studies were performed to ensure that the transmission system remains stable during normal and abnormal operating conditions with TMPP connected to the system. The stability studies have been performed on the 2002 Spring Case with TMPP connected to the system and reduced power transfer on the California Oregon Intertie (COI). Except for two cases, the transient stability performance of the system was as acceptable. In both unacceptable cases, the minimum transient frequencies were below the ISO criteria of 59.6 Hz. One of the unacceptable cases was caused by the connection of the TMPP; the other was aggravated by an

existing problem in the area. The stability concerns will need to be further studied in the Detailed Facility Study.

CAL-ISO REVIEW

The Cal-ISO has reviewed TMPP's Preliminary Facilities Study and has concluded that the Preliminary Facilities Study is adequate for the Cal-ISO to grant preliminary interconnection approval. Based on the Preliminary Facilities Study, there are a number of facilities that may need to be reinforced in order for TMPP to be interconnected to Cal-ISO controlled grid. The identified facilities are needed to relieve congestion and maintain system reliability. The criteria violations that will be mitigated by those facilities have been identified in the Cal-ISO's approval letter:

- Some frequency deviation criteria violations occur on generator terminal buses
- Some system overloads occur after TMPP is connected to the system under normal conditions

The Cal-ISO indicated that further investigation should be performed to determine if the frequency deviation violations would cause a load or generation loss. If no loss of load or generation would occur, modification of the frequency deviation criteria for these buses could be considered. PG&E will have to perform additional work in the Detailed Facilities Study prior to the Cal-ISO granting final interconnection approval to TMPP. However, it is likely that no downstream facilities not already identified would be required as a result of these additional studies.

CUMULATIVE IMPACTS

There are no cumulative environmental impacts resulting from the TMPP relative to this technical discipline.

FACILITY CLOSURE

INTRODUCTION

The parallel operation of generating stations is controlled, in part by CPUC Rule 21. This rule and standard utility practices for interconnecting a generating unit provide for the participating transmission owner (PTO) to have control of breakers and disconnect switches where the outlet line terminates (the Three Mountain Power plant switchyard) and general control over the interconnected generators. Prior to construction and interconnection of a generating unit, the PTO reviews and comments on the plans and specifications for the power plant and termination equipment that is important to safe and reliable parallel operation[8] and inspects the interconnection facilities. Contractual provisions may be developed to provide backup or other power service and codify procedures to be followed during parallel operation. Before generating stations are permitted to bid into the Cal-PX and be dispatched by the Cal-ISO, generator standards must be met and the generating

[8] As an example the PTO has control over the generating unit breakers so that only when the PTO's line crews have completed maintenance, for instance and are clear of the line or other facilities could the unit reclose into the system.

station must commit to comply with instructions of the Cal-ISO dispatchers. All participating generators must sign a Participating Generator Agreement (Cal-ISO 1998a, Cal-ISO 1998b). Procedures for planned, unexpected temporary closure and unexpected permanent closure must be developed or verified to facilitate effective communication and coordination between the generating station owner, PTO and the Cal-ISO to ensure safety and system reliability.

CPUC General Order 95, Rule 31.6 requires that "lines or portions of lines permanently abandoned shall be removed by their owners so that such lines shall not become a public nuisance or a hazard to life or property." Condition of certification TSE-1c requires compliance with this rule.

The ability of the above LORS to reasonably assure safe and reliable conditions in the event of facility closure was evaluated for three scenarios:

PLANNED CLOSURE

This type of closure occurs in a planned and orderly manner such as at the end of its useful economic or mechanical life or due to gradual obsolescence. Under such circumstances the requirement for the owner to provide a closure plan 12 months prior to closure in conjunction with applicable LORS is considered sufficient to provide adequately for safety and reliability. For instance, a planned closure provides time for the owner to coordinate with the PTO[9] to assure (as one example) that the PTO's system will not be closed into the outlet thus energizing the power plant switchyard. Alternatively, the owner may coordinate with the PTO to maintain some power service via the outlet line to supply critical station service equipment or other loads[10.]

UNEXPECTED TEMPORARY CLOSURE

This unplanned closure occurs when the facility is closed suddenly and/or unexpectedly for a short term due to unforeseen circumstances such as a natural or other disaster or emergency. During such a closure the facility cannot insert power into the utility system. Closures of this sort can be accommodated by establishment of an on-site contingency plan (see General Conditions Including Compliance Monitoring and Closure Plan).

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs when the project owner closes the facility suddenly and/or unexpectedly, or abandons the facility or a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. An on-site contingency plan that is in place and approved by the CPM prior to the beginning of commercial operation of the facilities will be developed to

[9] The PTO in this instance is PG&E e.g., the system owner to which the project is interconnected.

[10] These are mere examples; many more exist.

assure safety and reliability (see General Conditions Including Compliance Monitoring and Closure Plan).

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff has reviewed the Preliminary Facilities Study and the Cal-ISO has issued preliminary findings regarding the TMPP connection to the existing PG&E 230 kV Pit River hydro transmission lines. The Cal-ISO's preliminary findings indicate that reliability criteria will be met assuming implementation of the recommended Conditions of Certification, and no downstream facilities other than potential changes to circuit breakers within existing substation fence lines 60 linear miles of reconductoring and the implementation of new or modified remedial action schemes will be required for the interconnection of the TMPP to meet NERC, WSCC and Cal-ISO reliability criteria; staff concurs.

The proposed power plant switchyard configuration (single circuit 230 kV outlet, PG&E switchyard configuration, two 230 kV double circuit outlet lines 2600 feet long, 60 miles of reconductored existing PG&E 230 kV Pit River hydro lines and termination facilities at the Cottonwood and Round Mountain substations) will comply with applicable LORS and good engineering practices subject to implementation of the recommended Conditions of Certification.

RECOMMENDATIONS

Staff proposes the following conditions of certification to insure system reliability and conformance with LORS.

CONDITIONS OF CERTIFICATION

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

a. The power plant switchyard will contain four 230 kV circuit breakers and associated disconnect switches. The PG&E switchyard will consist of a double bus configuration with 6 circuit breaker bays with associated disconnected switches.
b. Breakers and bus in the power plant substation and other substations where applicable shall be sized to comply with a short circuit analysis.
c. The transmission facilities shall meet or exceed the requirements of CPUC General Order 95.
d. Approximately 60 linear miles of the existing PG&E Pit River hydro 230 kV lines shall be reconductored to the Round Mountain and Cottonwood substations. The new conductors will be place on the existing towers with

minor modification of tower arms with one conductor per phase. Insulator removal and placement of new insulators shall be performed by helicopter and the existing conductors shall be removed by withdrawal via the old conductors.

e. Termination facilities shall comply with applicable Cal-ISO and PG&E interconnection standards (PG&E Interconnection Handbook and CPUC Rule 21).
f. Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner/operator no later than 30 days prior to planned construction and comply with the owner's standards
g. The new transmission facilities shall use steel pole construction and conductors, which could be as small as 795 kcmil (Condor) aluminum conductor, steel-supported (ACSS) cable. Larger conductors resulting in more than minor modifications to the existing PG&E Pit River hydro lines shall not be used without written authorization of the CPM
h. The applicant shall provide a Detailed Facilities Study including a description of RAS sequencing and timing and an executed Facility Interconnection Agreement for the Three Mountain Power Project transmission interconnection with PG&E. The Detailed Facility Study shall include the analysis recommended by the Cal-ISO (Cal-ISO 1999a) and shall evaluate reactive margin for the SMUD and adjacent service areas. The Detailed Facilities Study and Interconnection Agreement shall be coordinated with the Cal-ISO and shall comply with the Cal-ISO's tariffs.
i. Sustained outages of the Pit River # 1, Pit River # 3, Sierra Pacific Industries, Burney Forest Products, Round Mountain, and Cottonwood substations and parallel lines, where applicable, due to construction activities shall be coordinated with the owner/operator of these facilities and minimized commensurate with CPUC General Order 95 and good engineering practices.

Verification: At least 60 days prior to start of construction or modification of transmission facilities or switchyards, the project owner shall submit for approval to the CPM, electrical one-line diagrams signed and sealed by a registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements 1a through 1i above. Substitution of equipment and line or substation configurations shall be identified and justified by the project owner for CPM approval.

TSE-2 The project owner shall inform the CPM of any impending changes, which may not conform to the requirements 1a through 1i of TSE-1, and have not received CPM approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment, transmission facilities or switchyard configurations shall not begin without prior written approval of the changes by the CPM.

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

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

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

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DEFINITION OF TERMS

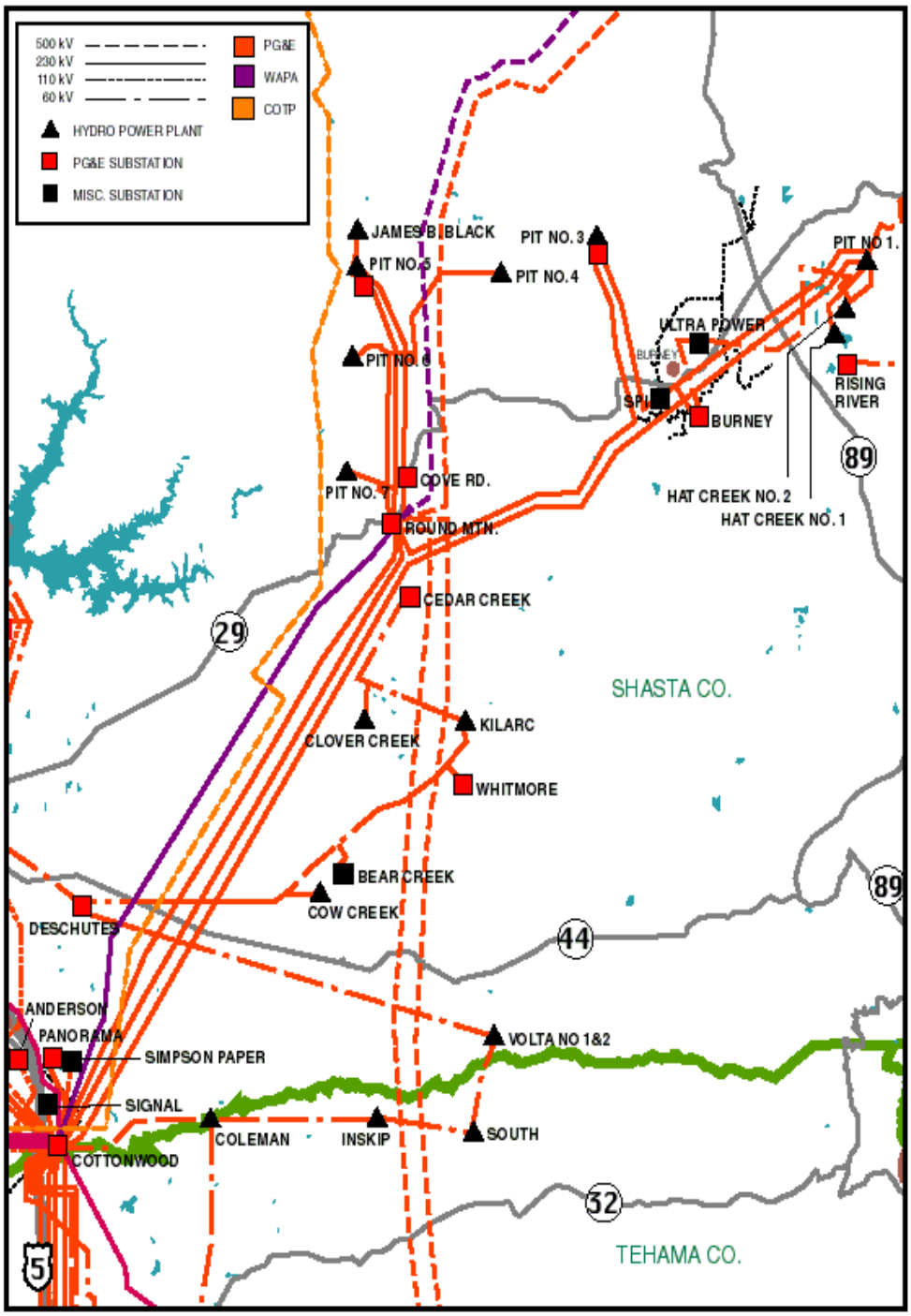
ACSS	Aluminum conductor steel -supported. A composite conductor made up of a steel core surrounded by aluminum wire.
Ampacity	Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.
Ampere	The unit of current flowing in a conductor.
Bundled	Two wires 18 inches apart.
Bus	Conductors that serve as a common connection for two or more circuits.
Conductor	The part of the transmission line (the wire) which carries the current.
Congestion Management	Congestion management is a scheduling protocol, which provides that dispatched generation, and transmission loading (imports) will not violate criteria.
Emergency Overload	See Single Contingency. This is also called an L-1.
Kcmil or kcm	Thousand circular mil. A unit of the conductor's cross sectional area; when divided by 1,273, the area in square inches is obtained.
Kilovolt	kV. A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.
L-1	The outage of a single circuit.
Loop	An electrical cul de sac. A transmission configuration, which interrupts an existing circuit, diverts it to another connection and returns a different circuit forming a loop or cul de sac.
Megavar	One megavolt ampere reactive.
Megavars	Mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.

Megavolt ampere	MVA. A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.
Megawatt	MW. A unit of power equivalent to 1,341 horsepower.
Normal Operation/ Normal Overload	When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.
N-1 Condition	See Single Contingency. Also called an L-1.
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.
Thermal rating	See ampacity.
TSE	Transmission System Engineering.
Undercrossing	A transmission configuration where a transmission line crosses below the conductors of another transmission line – generally at 90 degrees.

Underbuild	A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

Transmission System Engineering

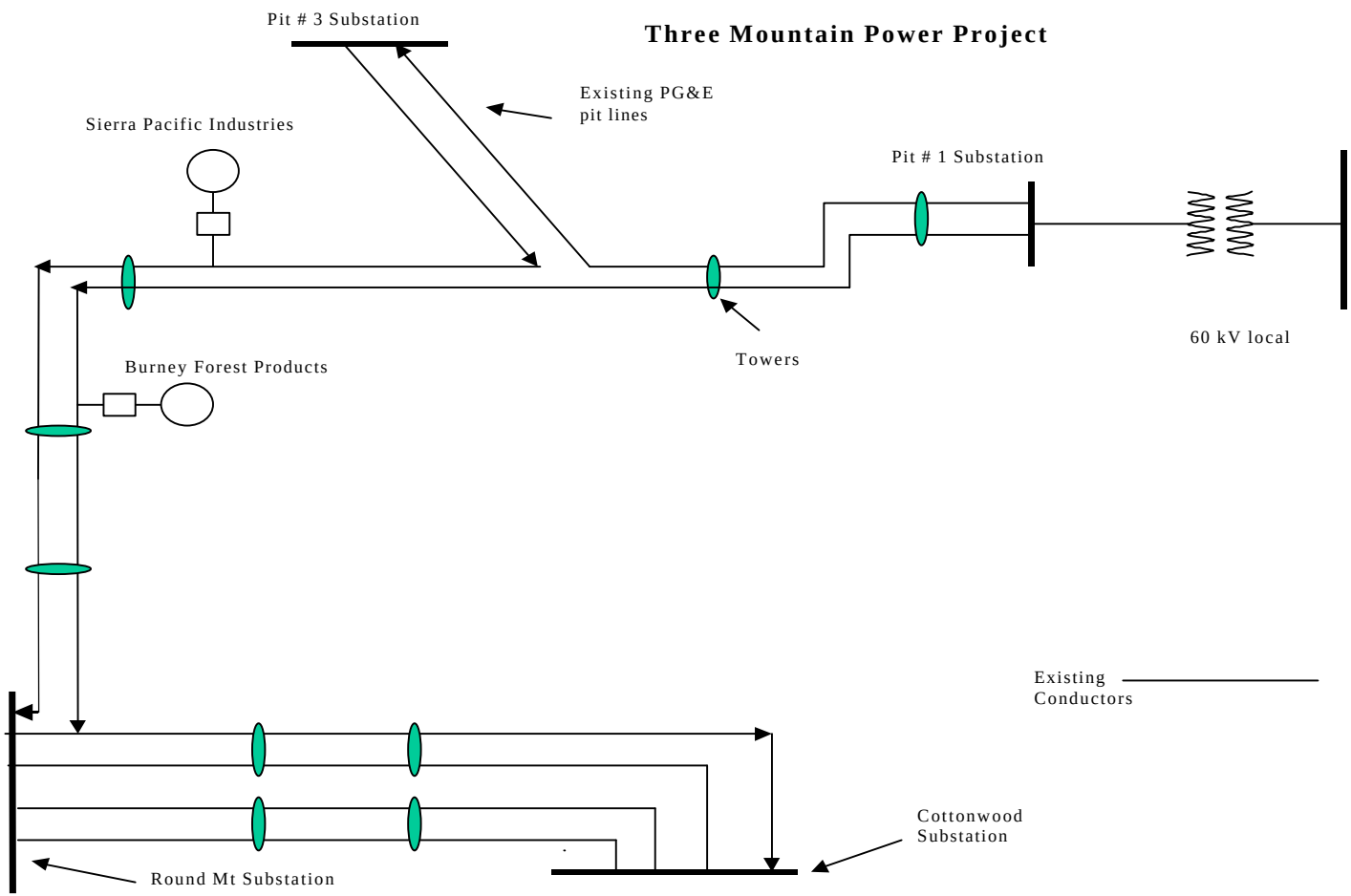
Figure 1- Transmission Facilities in Northern California



Source: CEC Staff

Transmission System Engineering

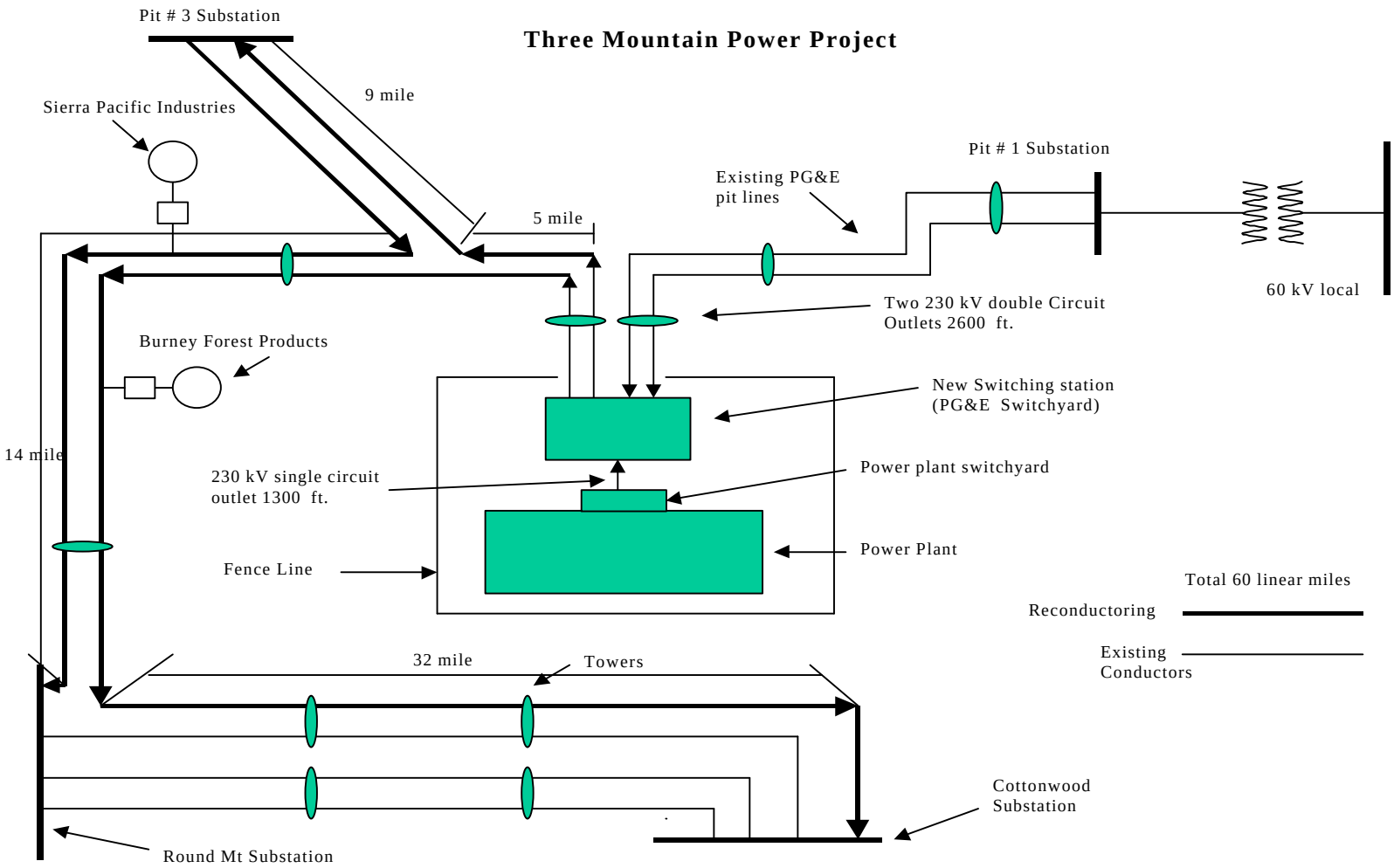
Figure 2 - Existing System



Source: CEC Staff

TRANSMISSION SYSTEM ENGINEERING

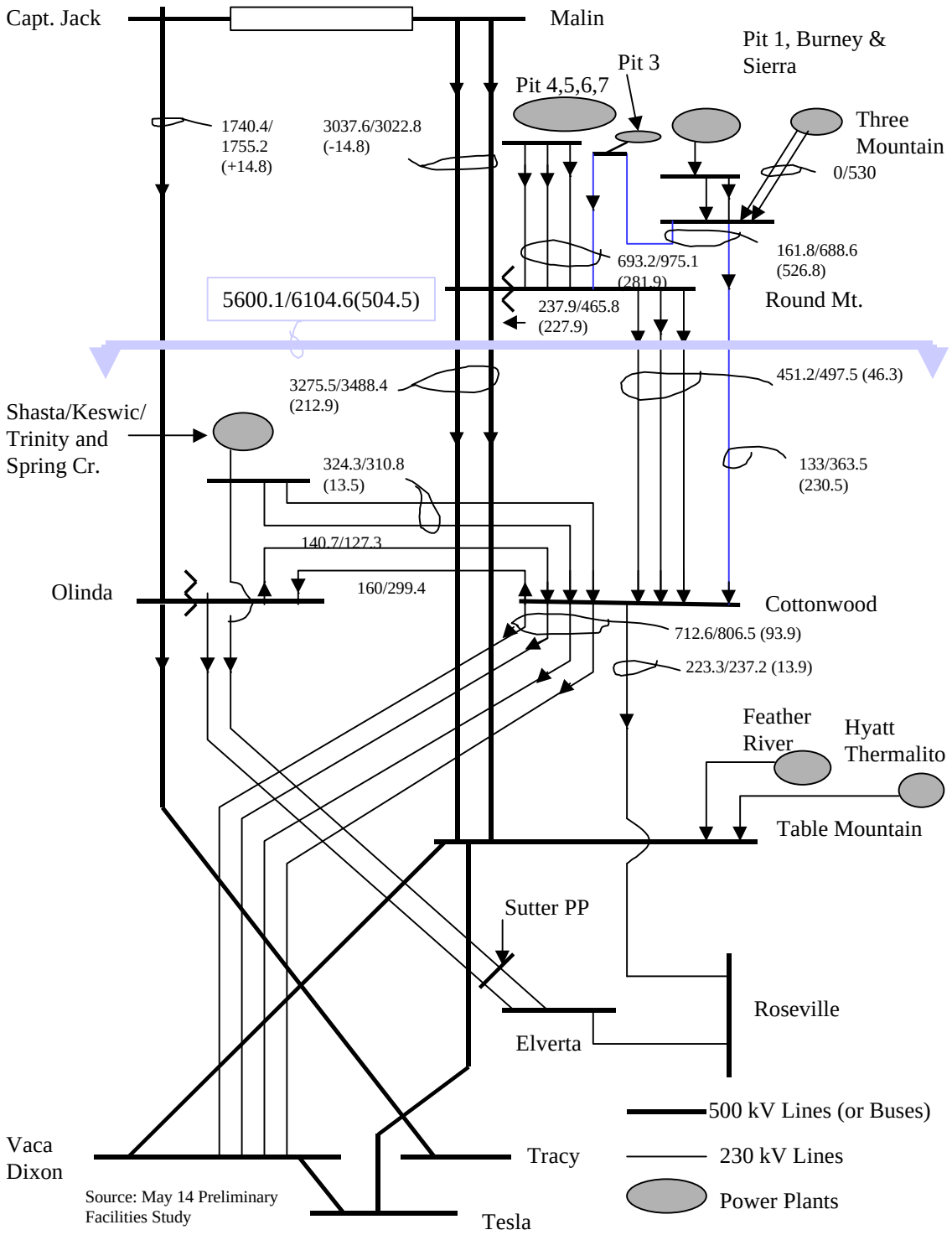
Figure 3 – Reconductoring



Source: CEC Staff

Transmission System Engineering
Figure 4

Three Mountain Power Flow Sensitivity



Source: May 14 Preliminary Facilities Study

GENERAL CONDITIONS
INCLUDING COMPLIANCE MONITORING AND CLOSURE PLAN

Testimony of Connie Bruins

INTRODUCTION

The project General Conditions Including Compliance Monitoring and Closure Plan (Compliance Plan) has been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in conjunction with air and water quality, public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission (Energy Commission) and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of the following elements:

1. General conditions that:

   - 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; and
   - state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions; and
   - establish requirements for facility closure plans.

2. Specific conditions of certification:

   - Specific conditions of certification that follow each technical area contain the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of verifying that the condition has been satisfied.

GENERAL CONDITIONS OF CERTIFICATION

COMPLIANCE PROJECT MANAGER (CPM) RESPONSIBILITIES

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

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

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

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval, it should be understood that the approval would involve all appropriate staff and management.

The Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Commission about power plant construction or operation-related questions, complaints or concerns.

PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING

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

ENERGY COMMISSION RECORD

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

1. all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
2. all monthly and annual compliance reports filed by the project owner;
3. all complaints of noncompliance filed with the Energy Commission; and,

4. all petitions for project or condition changes and the resulting staff or Energy Commission action taken.

PROJECT OWNER RESPONSIBILITIES

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

ACCESS

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

COMPLIANCE RECORD

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

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

COMPLIANCE VERIFICATIONS

Each condition of certification is followed by a means of "verification". The verification describes the Energy Commission's procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified, as necessary by the CPM, and in most cases without full Energy Commission approval.

Verification of compliance with the conditions of certification can be accomplished by:

1. reporting on the work done and providing the pertinent documentation in monthly and/or annual compliance reports filed by the project owner or authorized agent as required by the specific conditions of certification;
2. appropriate letters from delegate agencies verifying compliance;

3. Energy Commission staff audit of project records; and/or
4. Energy Commission staff inspection of mitigation and/or other evidence of mitigation.
5. Verification lead times (e.g., 90,60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

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

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

All submittals shall be addressed as follows:

Compliance Project Manager
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814

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

COMPLIANCE REPORTING

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

COMPLIANCE MATRIX

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to

provide the CPM with the current status of all compliance conditions in a spreadsheet format. The compliance matrix must identify:

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

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

Pre-Construction Matrix

Prior to commencing construction a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with the project owner's **first** compliance submittal. It will be in the same format as the compliance matrix referenced above.

Tasks Prior to Start of Construction

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Project owners frequently anticipate starting project construction as soon as the project is certified. In some cases it may be necessary for the project owner to file submittals prior to certification if the required lead-time extends beyond the date anticipated for start of construction. It is also important that the project owner understand that pre-construction activities that are initiated prior to certification are performed at the owner's own risk. Failure to allow specified lead-time may cause delays in start of construction.

Various lead times for verification submittals to the CPM for conditions of certification are established to allow sufficient staff time to review and comment, and if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

Monthly Compliance Report

The first Monthly Compliance Report is due the month following the Energy Commission business meeting date that the project was approved, unless the

otherwise agreed to by the CPM. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the Key Events List. The Key Events List is found at the end of this section.

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

1. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;
3. an initial, and thereafter updated, compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
4. a list of conditions which have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;
5. a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;
6. a cumulative listing of any approved changes to conditions of certification;
7. a listing of any filings with, or permits issued by, other governmental agencies during the month;
8. a projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance conditions of certification;
9. a listing of the month's additions to the on-site compliance file; and
10. any requests to dispose of items that are required to be maintained in the project owner's compliance file.
11. a listing of complaints, notices of violation, official warnings, and citations received during the month; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

ANNUAL COMPLIANCE REPORT

After the air district has issued a Permit to Operate, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over

the life of the project unless otherwise specified by the CPM. Each Annual Compliance Report shall identify the reporting period and shall contain the following:

1. an updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
2. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Annual Compliance Report;
4. a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;
5. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. a listing of filings made to, or permits issued by, other governmental agencies during the year;
7. a projection of project compliance activities scheduled during the next year;
8. a listing of the year's additions to the on-site compliance file, and
9. an evaluation of the on-site contingency plan for unexpected facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section].
10. a listing of complaints, notices of violation, official warnings, and citations received during the year; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

CONFIDENTIAL INFORMATION

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

DEPARTMENT OF FISH AND GAME FILING FEE

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

REPORTING OF COMPLAINTS, NOTICES, AND CITATIONS

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering, with date and time stamp recording. The telephone number shall be posted at the project site and easily visible to passersby during construction and operation.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt, to the CPM. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the Complaint Form which follows:

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made which provide the flexibility to deal with the specific situation and project setting which will exist at the time of closure. LORS pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

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

PLANNED CLOSURE

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

UNEXPECTED TEMPORARY CLOSURE

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

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency

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.)

plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned.

GENERAL CONDITIONS FOR FACILITY CLOSURE

PLANNED CLOSURE

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

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.

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;

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

address conformance of the plan with all applicable laws, ordinances, regulations, standards, local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

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

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

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

UNEXPECTED TEMPORARY CLOSURE

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

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

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

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

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

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

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

UNEXPECTED PERMANENT CLOSURE

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

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

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

A closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the permanent closure (or other period of time agreed to by the CPM).

DELEGATE AGENCIES

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

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

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

ENFORCEMENT

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may

impose a civil penalty for any significant failure to comply with the terms or conditions of the Commission Decision.

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

NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1230 et. seq., but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by current law or regulations.

INFORMAL DISPUTE RESOLUTION PROCEDURE

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

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1230 et. seq., but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The procedure encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be referred to the full Energy Commission for consideration via the complaint and investigation process. The procedure for informal dispute resolution is as follows:

REQUEST FOR INFORMAL INVESTIGATION

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

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

to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and within seven (7) working days of the CPM's request, provide a written report of the results of the investigation, including corrective measures proposed or undertaken, to the CPM. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to provide an initial report, within forty-eight (48) hours, followed by a written report filed within seven (7) days.

REQUEST FOR INFORMAL MEETING

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

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

secure the attendance of appropriate Energy Commission staff and staff of any other agency with expertise in the subject area of concern as necessary;

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,

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

FORMAL DISPUTE RESOLUTION PROCEDURE-COMPLAINTS AND INVESTIGATIONS

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution process, such party may file a complaint or a request for an investigation with the Energy Commission's General Counsel. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230 et. seq.

The Chairman, upon receipt of a written request stating the basis of the dispute, may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Commission shall have the authority to consider all relevant facts

involved and make any appropriate orders consistent with its jurisdiction (Title 20, California Code of Regulations, sections 1232 - 1236).

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

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

A petition is required for **amendments** and for **insignificant project changes**. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the Commission's Docket in accordance with Title 20, California Code of Regulations, section 1209. The criteria that determine which type of change process applies are explained below.

AMENDMENT

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

INSIGNIFICANT PROJECT CHANGE

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

VERIFICATION CHANGE

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

KEY EVENT LIST

PROJECT _____ DATE ENTERED

DOCKET # _____ PROJECT MANAGER

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

GLOSSARY OF TERMS AND ACRONYMS

A

A Ampere

AAL All aluminum (electricity conductor)

AADT Annual Average Daily Traffic

AAQS Ambient Air Quality Standards

AC Alternating Current

ACEC Area of Critical Environmental Concern

ACGIH American Conference of Government and Industrial Hygienists

ACE (U.S.) Army Corps of Engineers

ACSR Aluminum Covered Steel Reinforced (electricity conductor)

AERA

AFC Application for Certification

AFY acre-feet per year

AHM Acutely Hazardous Materials

AIHA American Industrial Hygienists Association

ANSI American National Standards Institute

APCD Air Pollution Control District

APCO Air Pollution Control Officer

AQMP Air Quality Management Plan

ARB Air Resources Board

ARCO Atlantic Richfield Company

ASAE American Society of Architectural Engineers

ASHRAE American Society of Heating Refrigeration & Air Conditioning Engineers

ASME American Society of Mechanical Engineers

ATC Authority to Construct

AWS American Welding Society

B

BACT Best Available Control Technology

BARCT Best Available Retrofit Control Technology

bbl barrel

BCF billion cubic feet

Bcfd billion cubic feet per day

b/d barrels per day

BO Biological Opinion

BLM (U.S.) Bureau of Land Management

BR Biennial Report

BRMIMP Biological Resources Mitigation and Monitoring Plan

Btu British thermal unit

C

CAA (U.S.) Clean Air Act

CAAQS California Ambient Air Quality Standards

CalEPA California Environmental Protection Agency

Cal-OSHA California Occupational Safety and Health Administration

Cal-PX California Power Exchange

Caltrans California Department of Transportation

CAPCOA California Air Pollution Control Officers Association

CARB California Air Resources Board

CATEF California Toxic Emissions Factors

CBC California Building Code

CBO Chief Building Official

CCAA California Clean Air Act

CCR California Code of Regulations

CDF California Department of Forestry

CDFG California Department of Fish and Game

CEERT Coalition for Energy Efficiency and Renewable Technologies

CEM Continuous Emissions Monitoring

CEQA California Environmental Quality Act

CERCLA Comprehensive Environmental Response Compensation and Liability Act

CESA California Endangered Species Act

CFB Circulating Fluidized Bed

CFCs Chloro-fluorocarbons

cfm cubic feet per minute

CFR Code of Federal Regulations

cfs cubic feet per second

CLUP Comprehensive Land Use Plan

CNEL Community Noise Equivalent Level

CNLM Center for Natural Lands Management

CO Carbon Monoxide

CO2 Carbon Dioxide

COC Condition of Certification

CPM Compliance Project Manager

CPUC California Public Utilities Commission

CRTR Cultural Resources Technical Report

CT Combustion Turbine
Current Transformer

CTG Combustion Turbine Generator

CUPA Certified Unified Program Agency

CURE California Unions for Reliable Energy

D

dB decibel

dB(A) decibel on the A scale

DC Direct Current

DCS Distributed Control System

DCTL Double Circuit Transmission Line

DEIR Draft Environmental Impact Report

DEIS Draft Environmental Impact Statement

DHS (California) Department of Health Services

DISCO Distribution Company

DOC Determination of Compliance

DOE (U.S.) Department of Energy

DOG (California) Department of Oil and Gas

DSM Demand Side Management

DTC Desert Tortoise Council

DTSC (CalEPA) Department of Toxic Substances Control

DWR (California) Department of Water Resources

E

EA Environmental Assessment

EDF Environmental Defense Fund

EDR Energy Development Report

EEGL Emergency Response Planning Guidelines

EFS&EPD Energy Facilities Siting and Environmental Protection Division

EIA (U.S.) Energy Information Agency

EIR Environmental Impact Report

EIS Environmental Impact Statement

EJ Environmental Justice

ELFIN Electric Utility Financial and Production Simulation Model

EMF Electromagnetic Field

EPA (U.S.) Environmental Protection Agency

EPA-ARI (U.S.) Environmental Protection Agency-Accidental Release Information Program

EPRI Electric Power Research Institute

ER Electricity Report

ERC Emission Reduction Credit {offset}

ERNS Emergency Response Notification System

ERPG Emergency Response Planning Guidelines

ESA Endangered Species Act (Federal) Environmental Site Assessment

ETSR Energy Technologies Status Report

F

FAA (U.S.) Federal Aviation Administration

FBE Functional Basis Earthquake

FCAA Federal Clean Air Act

FCC Federal Communications Commission

FE Federally (listed) Endangered

FEIR Final Environmental Impact Report

FERC Federal Energy Regulatory Commission

FIP Federal Implementation Plan

FLPMA Federal Land Policy Management Act

FONSI Finding of No Significant Impact

FP (State) Fully Protected

FSA Final Staff Assessment

FT Federally (listed) Threatened

G

GE General Electric

GEP Good Engineering Practice

GIS Gas Insulated Switchgear Geographic Information System

gpd gallons per day

gpm gallons per minute

GW gigawatt

GWh gigawatt hour

H

H2S Hydrogen Sulfide

HCP Habitat Conservation Plan

HHV Higher Heating Value

HRA Health Risk Assessment

HRSG Heat Recovery Steam Generator

HV High Voltage

HVAC Heating, Ventilation and Air Conditioning

I

IAR Issues and Alternatives Report

IDLH Immediately Dangerous to Life and Health Level

IEA International Energy Agency

IEEE Institute of Electrical & Electronics Engineers

IIPP Injury and Illness Prevention Program

IIR Issues Identification Report

IMPLAN Impact Analysis for Planning

IOU Investor-Owned Utility

IS Initial Study

ISO Independent System Operator

ISCST3 Industrial Source Complex Short-Term model, Version 3

J

None

K

KCFD Kern County Fire Department

KCM thousand circular mils (also KCmil) (electricity conductor)

km kilometer

KOP Key Observation Point

kV kilovolt

KVAR kilovolt-ampere reactive

kW kilowatt

kWe kilowatt, electric

kWh kilowatt hour

kWp peak kilowatt

L

LAER Lowest Achievable Emission Rate

lbs pounds

lbs/hr pounds per hour

lbs/MMBtu Pounds Per Million British Thermal Units

LORS Laws, Ordinances, Regulations and Standards

LOS Level of Service

M

m (M) meter, million, mega, milli or thousand

MCE Maximum Credible Earthquake

MCF thousand cubic feet

MCL Maximum Containment Level

MCM thousand circular mil (electricity conductor)

µg/m3 micro grams (10-6 grams) per cubic meter

MG milli gauss

mgd million gallons per day

MOU Memorandum of Understanding

MPE Maximum Probable Earthquake

m/s meters per second

MS Mail Station

MVAR megavolt-ampere reactive

MW megawatt (million watts)

MWh megawatt hour

MWp peak megawatt

N

N-1 One transmission circuit out

N-2 Two transmission circuits out

NAAQS National Ambient Air Quality Standards

NAHC Native American Heritage Council

NCR Non-Conformance Report

NEC National Electrical Code

NEPA National Energy Policy Act
National Environmental Policy Act

NERC National Electric Reliability Council

NESHAPS National Emission Standards for Hazardous Air Pollutants

NIOSH National Institute of Occupational Health and Safety

NMHC nonmethane hydrocarbons

NO nitrogen oxide

NOI Notice of Intention

NOx nitrogen oxides

NO2 nitrogen dioxide

NOP Notice of Preparation (of EIR)

NOV Notice of Violation

NRC National Research Council
National Response Center

NRDC Natural Resources Defense Council

NSPS New Source Performance Standards

NSR New Source Review

O

O3 Ozone

OASIS Open Access Same-Time Information System

OCB Oil Circuit Breaker

OCSG Operating Capability Study Group

O&M Operation and Maintenance

OLM Ozone Limiting Method

OSHA Occupational Safety and Health Administration (or Act)

P

PAH Polycyclic Aromatic Hydrocarbons

PG&E Pacific Gas & Electric Company

PHC(S) Prehearing Conference (Statement)

PIFUA Federal Powerplant & Industrial Fuel Use Act of 1978

PM Project Manager
particulate matter

PMPD Presiding Member's Proposed Decision

PM10 Particulate matter 10 microns and smaller in diameter

PM2.5 Particulate matter 2.5 microns and smaller in diameter

PPE Personal Protective Equipment

ppb parts per billion

ppm parts per million

ppmvd parts per million by volume, dry

ppt parts per thousand

PSA Preliminary Staff Assessment

PRC (California) Public Resources Code

PSD Prevention of Significant Deterioration

PT Potential Transformer

PTO Permit to Operate
Participating Transmission Owner

PU per unit

PURPA Federal Public Utilities Regulatory Policy Act of 1978

PV photovoltaic

PX Power Exchange

Q

QA/QC Quality Assurance/Quality Control

QF Qualifying Facility

R

RACT Reasonably Available Control Technology

RCRA Resource Conservation and Recovery Act

RDF Refuse Derived Fuel

RE Resident Engineer

RMP Risk Management Plan

ROC Report of Conversation
Reactive Organic Compounds

ROG Reactive Organic Gas

ROW Right-of-Way

RWQCB Regional Water Quality Control Board

S

SARA Superfund Amendments and Reauthorization Act of 1986

SB Senate Bill

SCFM standard cubic feet per minute

SCH State Clearing House

SCR Selective Catalytic Reduction

SCTL Single Circuit Transmission Line

SE State (listed) Endangered

SHPO State Office of Historic Preservation

SIC Standard industrial classification

SIP State Implementation Plan

SJVAB San Joaquin Valley Air Basin

SJVUAPCD San Joaquin Valley Unified Air Pollution Control District

SMP Safety Management Plan

SNCR Selective Noncatalytic Reduction

SNG Synthetic Natural Gas

SO2 Sulfur Dioxide

SOx Oxides of Sulfur

SO4 Sulfates

SSC Species of Special Concern

ST State (listed) Threatened

STEL Short Term Exposure Limit

STPEL Short Term Public Emergency Limit(s)

STIG Steam Injected Gas Turbine

SWP State Water Project

SWRCB State Water Resources Control Board

T

TAC Toxic Air Contaminant

Tbtu trillion Btu

TCF trillion cubic feet

TCM Transportation Control Measure

TDS Total Dissolved Solids

TE Transmission Engineering

TEOR Thermally Enhanced Oil Recovery

TL Transmission Line (or lines)

T-Line Transmission Line

TLV Threshold Limit Value

TOG Total Organic Gases

TPD tons per day

TPY tons per year

TS&N Transmission Safety and Nuisance

TSE Transmission System Engineering

TSIN Transmission Services Information Network

TSP Total Suspended Particulate Matter

U

UBC Uniform Building Code

UDC Utility Displacement Credits

UDF Utility Displacement Factor

UEG Utility Electric Generator

UFC Uniform Fire Code

USC United States Code

USC(A) United States Code (Annotated)

USCOE U.S. (Army) Corps of Engineers

USEPA U.S. Environmental Protection Agency

USFS U.S. Forest Service

USFWS U.S. Fish and Wildlife Service

USGS U.S. Geological Survey

V

VISCREEN

VOC Volatile Organic Compound(s)

VRM Visual Resource Management

W

W Watt

WAA Warren-Alquist Act

WEPEX Western Energy Power Exchange

WHO World Health Organization

WICF Western Interconnection Forum

WIEB Western Interstate Energy Board

WPLT Western Pluvial Lakes Tradition

WRTA Western Region Transmission Association

WSCC Western System Coordination Council

WSPP Western System Power Pool

PREPARATION TEAM

Executive Summary ..... Richard Buell

Introduction ..... …Richard Buell

Project Description ..... Richard Buell

Need Conformance ..... Dick Ratliff

Air Quality ..... Tuan Ngo

Public Health ..... Obed Odoemelam

Worker Safety and Fire Protection ..... Chris Tooker

Transmission Line Safety and Nuisance ..... Obed Odoemelam

Hazardous Materials ..... Rick Tyler

Waste Management ..... Michael Ringer

Land Use ..... Gary Walker

Traffic and Transportation ..... Steve Brown

Noise ..... M. Kisabuli

Visual Resources ..... David Flores

Cultural Resources ..... Kathy Matthews

Socioeconomics ..... Jim Adams

Biology ..... Linda Spiegel

Water and Soils ..... Richard Sapudar/Linda Bond

Geology ..... Robert Anderson

Facility Design ..... M. Kisabuli, Steve Baker and Al McCuen

Reliability ..... Steve Baker

Efficiency ..... Steve Baker

Transmission System Engineering ..... Laiping Ng and Al McCuen

Alternatives.....Richard Buell/Gary Walker/Lance Shaw

Compliance Monitoring Plan and General Conditions ..... Connie Bruins

Glossary of Terms and Acronyms .....Bert Fegg

Project Secretary.....Pat Owen

Support Staff .....Luz Manriquez, Sharee Knight and Chester Hong

WITNESS QUALIFICATIONS AND DECLARATIONS