STAFF REPORT

Preliminary Staff Assessment

MOSS LANDING POWER PLANT PROJECT

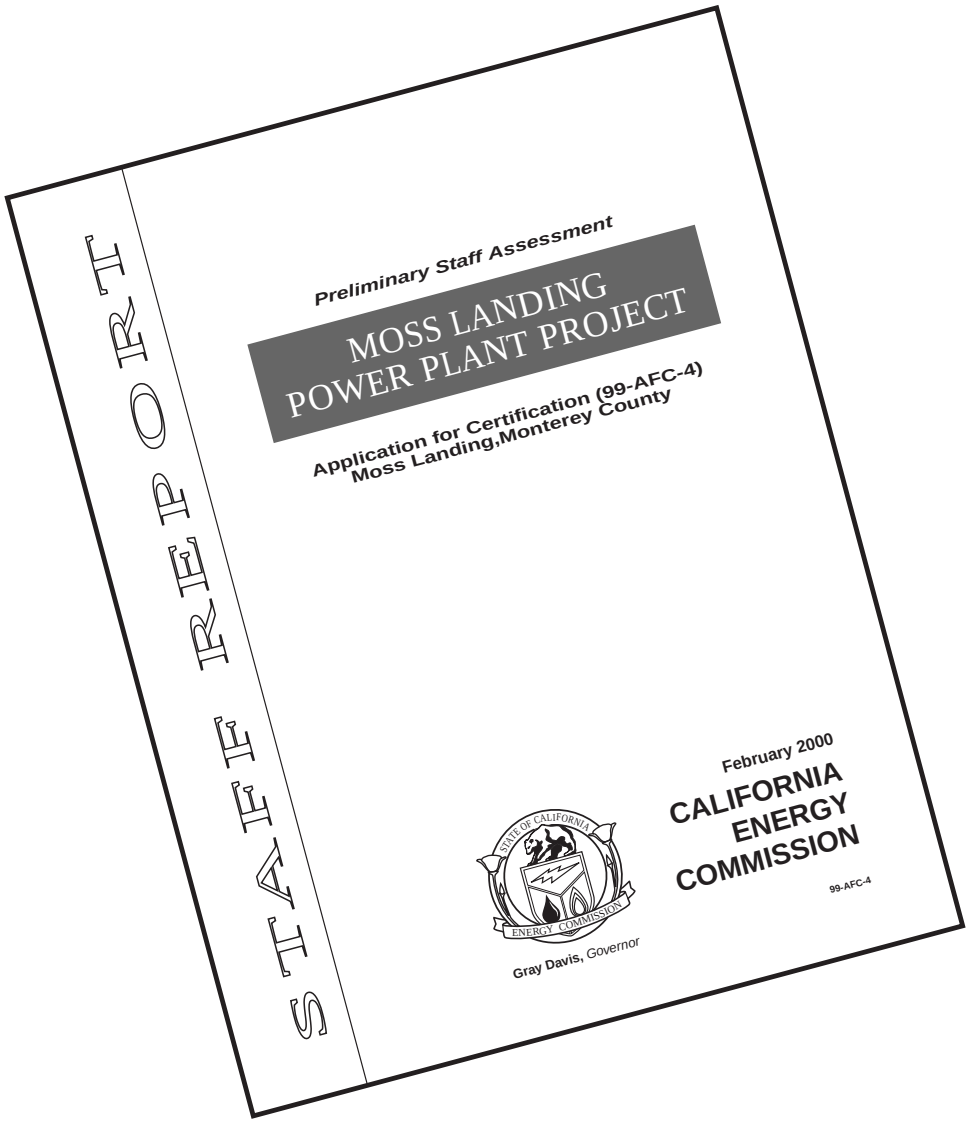
Application for Certification (99-AFC-4)
Moss Landing,Monterey County

February 2000

CALIFORNIA ENERGY COMMISSION

Gray Davis, *Governor*

99-AFC-4



CALIFORNIA ENERGY COMMISSION

Paul Richins, Jr., *Energy Commission Project Manager*
Robert Haussler, *Manager*

SITING OFFICE

Robert L. Therkelsen, *Deputy Director*

ENERGY FACILITIES SITING &
ENVIRONMENTAL PROTECTION DIVISION

Table of Contents
MOSS LANDING POWER PLANT PROJECT

EXECUTIVE SUMMARY

INTRODUCTION

PROJECT DESCRIPTION

NEED CONFORMANCE

AIR QUALITY

PUBLIC HEALTH

WORKER SAFETY AND FIRE PROTECTION

TRANSMISSION LINE SAFETY AND NUISANCE

HAZARDOUS MATERIALS MANAGEMENT

WASTE MANAGEMENT

LAND USE

TRAFFIC AND TRANSPORTATION

NOISE

VISUAL RESOURCES

CULTURAL RESOURCES

SOCIOECONOMIC RESOURCES

BIOLOGICAL RESOURCES

SOILS AND WATER RESOURCES

GEOLOGY AND PALEONTOLOGY

FACILITY DESIGN

POWER PLANT RELIABILITY

POWER PLANT EFFICIENCY

TRANSMISSION SYSTEM ENGINEERING

ALTERNATIVES

COMPLIANCE MONITORING AND FACILITY CLOSURE

PREPARATION TEAM

EXECUTIVE SUMMARY

On May 7, 1999, Duke Energy Moss Landing LLC filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) to construct and operate the proposed Moss Landing Power Plant Project (MLPPP). The AFC was determined to be data adequate by the Energy Commission at the August 11, 1999 business meeting. This finding triggers the beginning of the staff s review and analysis of the project.

The existing Moss Landing Power Plant is an extensive industrial complex of 7 electric generation units, 10 225-foot exhaust stacks, 19 fuel storage tanks, 2 seawater inlet and out fall structures, various warehouse and office buildings, and other related equipment on a 239-acre site. The power plant has been generating electricity since 1950. Units 1-5 (613 MWs), originally built in the 1950 s was shut down in 1995. Units 6 and 7 (1,500 MWs) are currently in operation. On July 1, 1998, Duke Energy purchased the 239-acre site from PG&E. PG&E retained the adjacent 500/230/115-kV substation.

The project is proposed to be located at the existing Moss Landing Power Plant site. This site is located about 12 miles northwest of Salinas, California in Monterey County at the intersection of Highway 1 and Dolan Road, east of the community of Moss Landing. The plant is situated near the Moss Landing Harbor in an area that includes industrial facilities, agricultural lands, spare residences, recreational beaches and tidal wetlands.

The Moss Landing Power Plant Project consists of replacing the existing electric power generation Units 1-5 with two 530 MW, natural gas-fired, combined cycle, units. Each combined cycle unit consists of two natural gas fired combustion turbine generators (CTGs), two unfired heat recovery steam generators (HRSGs) and a reheat, condensing steam turbine generator (STG). Each combined cycle unit will use seawater for once through cooling. In addition, they plan to dismantle 8 of the existing 225-foot stacks that were previously used for Units 1-5.

There are no linear facilities outside the property owned by Duke Energy and the adjacent PG&E substation. The natural gas pipeline connection, interconnection to the PG&E substation, ocean water intake are all contained on these two adjacent properties.

In addition, Duke will be removing the large fuel storage tanks on site and adding SCR (air emission control technology) to existing Units 6 and 7. Monterey County is the lead agency for the environmental review of these projects but the analysis in this document includes a discussion and analysis of any potential cumulative impacts from these projects.

If the project were to be approved by the Energy Commission, construction is expected to begin immediately after the decision and will take about 29 months. Full-scale commercial operation is expected by mid 2002. Duke Energy expects a peak work force of approximately 732 craft laborers, supervisory, support and construction management personnel on the site during construction. The capital cost of the project is estimated to be about $475 million.

ENERGY COMMISSION JURISDICTION

The Moss Landing Power Plant Project and related facilities such as the electric transmission lines, natural gas line, steam lines and wastewater lines are under the Energy Commission jurisdiction (Pub. Resources Code (PRC)∥25500 et seq.). When issuing a license, the Energy Commission acts as lead state agency (PRC∕25519(c)) under the California Environmental Quality Act (PRC∥21000 et seq.), and its process is functionally equivalent to the preparation of an environmental impact report (PRC∕21080.5).

Staff's primary responsibility is to provide an independent assessment of the project's potentially significant effects on the environment, the public's health and safety, conformance with all applicable laws, ordinances, regulations and standards (LORS), and measures to mitigate any identified potential effects. The analyses contained in this FSA were prepared in accordance with PRC Sections 25500 et seq.; the California Code of Regulations (CCR) Title 20, Sections 12001 et seq.; and the California Environmental Quality Act (PRC∥21000 et seq.) and its guidelines (CCR title 14∥15000 et seq.).

The Preliminary Staff Assessment (PSA) presents draft conclusions and conditions of certification for the design, construction, operation and closure of the facility. The analyses contained in this document are based upon information from the AFC and subsequent revisions; responses to data requests; supplemental information from local, state and federal agencies, local citizens and interested parties; existing documents and publications; independent field study and information gained at various workshops.

PUBLIC AND AGENCY COORDINATION

Extensive coordination has occurred with the numerous local, state and federal agencies that have an interest in the project. Particularly, Energy Commission staff and Duke Energy have worked with the County of Monterey, the California Independent System Operator (Cal-ISO), the Monterey Bay Unified Air Pollution Control District, California Air Resources Board, and the U.S. Environmental Protection agency, California Coastal Commission, California Water Control Board and the Regional Water Quality Control Board to identify and resolve issues of concern. In addition we have coordinated the review and analysis of the project with U.S. Fish and Wildlife Service, Department of Fish and Game, National Marine Fisheries, U.S. Army Corp of Engineers, California Unions for Reliable Energy, and the interested residents of the community.

The Regional Water Quality Control Board has established a technical working group to advise on the Section 316(a) and 316(b) Clean Water Act studies. Duke

Energy, the Regional Water Quality Control Board, the Energy Commission and other interested agencies have actively participated in reviewing the recently collected data. At a recently held meeting of the technical advisory group it was determined that additional data would need to be gathered prior to the completion of the final draft and final Section 316 reports could be completed and accepted by the Regional Water Quality Board. The number of additional months of data collection is undetermined at this time.

Another important part of our coordination efforts has been with the California Coastal Commission. In accordance with state law, the California Coastal Commission is required to complete an analysis and provide the Energy Commission with their assessment of any power plant proposed in California s coastal zone. Originally the Coastal Commission had planned to complete its report and provide it to the Energy Commission prior to the PSA so that it could be incorporated into the document. For a variety of reasons this optimistic schedule did not occur and we are now hopeful that the report can be received prior to evidentiary hearings.

Workshops on the PSA will be held to receive input from intervenors, interested public participants, and local, state, and federal agencies. Input from these publicly noticed workshops will be incorporated into the Final Staff Assessment.

SCHEDULING ISSUES

For the California Coastal Commission to complete its report to the Energy Commission, it must have an accepted Section 316 study. Originally these studies were to be completed by March 1. With the requirement that additional data collection is necessary, the completion date for the Section 316 studies is unknown at this time.

Although the Energy Commission staff has received and reviewed the numerous interim reports and draft Section 316 studies, we desire the completed Section 316 studies on which to make a recommendation on water resources and biological resources. The Energy Commission staff can complete the Final Staff Assessment by the required March 28 date but would not have complete information on which to make a recommendation regarding impacts to water resources and biological resources. If the applicant feels that more time is necessary, they should request a delay in the schedule and waive the one-year requirement for a final decision in the Moss Landing proceedings.

CONCLUSION AND RECOMMENDATIONS

Each technical area assessment in the PSA includes a discussion of the project and the existing environmental setting; the project's conformance with laws, ordinances, regulations and standards (LORS) and whether the facility can be constructed and operated safely and reliably; project specific and cumulative impacts; the environmental consequences of the project using the proposed mitigation measures; conclusions and recommendations; and any proposed conditions of certification under which the project should be constructed and operated, if it is approved.

In summary we conclude that:

- the Energy Commission has not received the Coastal Commission s report and assessment as required by California statute;
- the project could, without mitigation, potentially result in a significant impacts to air quality, marine biology and water resources. These issues are under further review and additional data is being gathered by Duke Energy on these issues;
- the project is in conformance with all Laws, Ordinances, Regulations and Standards (LORS) with the potential exception of air quality, water resources, biological resources, Monterey County Local Coastal Program (public access, height limit, and approval of the Moss Landing site master plan),
- each of the four sites reviewed in the alternative site analysis had both advantages and disadvantages, but no alternative site was without major defect; they either had the potential for significant environmental impacts or were potentially infeasible for a variety of other reasons.
- if the project is approved, the proposed conditions of certification included in the various technical areas should be adopted to ensure that project s specific impacts for both construction and operation are mitigated to a level less than significant.

INTRODUCTION

On May 7, 1999, Duke Energy Moss Landing LLC filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) to construct and operate the proposed 1060-megawatt (MW) Moss Landing Power Plant Project. On August 11, 1999, the Energy Commission found the AFC to be data adequate. Acceptance of the AFC by the Energy Commission initiates staff s review and analysis of the project.

This document presents the California Energy Commission staff's independent assessment[1] of Duke Energy s Application for Certification (AFC) for the Moss Landing Power Plant Project (MLPPP). The Preliminary Staff Assessment (PSA) includes our draft evaluation of the proposed project in 19 technical areas.

Workshops on the PSA will be held to receive input from intervenors, interested public participants, and local, state, and federal agencies. Input from these publicly noticed workshops will be incorporated into the Final Staff Assessment.

ORGANIZATION OF THE REPORT

The PSA describes the following:

- the project and the existing environmental setting;
- whether the facilities can be constructed and operated safely and reliably in accordance with applicable laws, ordinances, regulations and standards;
- the environmental consequences of the project using mitigation measures proposed by Duke Energy, Energy Commission staff, and federal, state and local agencies;
- cumulative analysis of the potential impacts of the project along with the potential impacts from other existing developments or known planned developments;
- the proposed conditions under which the project should be constructed and operated if it is certified;
- project closure conditions; and
- project alternatives.

[1] The Energy Commission is responsible for reviewing and ultimately approving or denying all thermal electric power plants, 50 MW and greater, proposed for construction in California. The Commission's responsibilities are similar to those of a lead agency under the California Environmental Quality Act (CEQA). The FSA carefully examines public health and safety, environmental impacts and engineering aspects of proposed power plants and all related facilities such as electric transmission lines, natural gas pipelines and water lines. The FSA was prepared pursuant to Title 20, California Code of Regulations, Sections 1742.5, 1743 and 1744.

The staff assessment contained in this document is based upon information from the Application for Certification (Docket 99-AFC-4), supplemental AFC information filed by Duke Energy, responses to Energy Commission data requests, Duke Energy s mitigation measures, existing documents and publications, independent field studies and research, information gathered from local, state and federal agencies, and input provided by interested individuals and intervenors. The PSA presents draft conclusions and draft proposed conditions of certification applicable to both the construction and operation of the project.

The PSA contains an Executive Summary, Introduction, Project Description, Project Alternatives and staff recommendation on Need Conformance. The environmental, engineering, and public health and safety analysis of the proposed project is contained in 19 technical areas. Each technical area is included in a separate chapter and are as follows: air quality, public health, worker safety and fire protection, transmission line safety, hazardous material management, waste management, land use, traffic and transportation, noise, visual resources, cultural resources, socioeconomics, biological resources, water resources, geology (including geologic hazards, surface water hydrology, paleontological resources, geological resources) facility design, power plant reliability, power plant efficiency and transmission system engineering. These chapters are followed by a discussion of facility closure, project construction and operation compliance monitoring plans, witness qualifications, glossary of terms and a list of staff that assisted in preparing this report.

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

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

In addition to the project as described, Duke will be removing the large fuel storage tanks on site and adding SCR (air emission control technology) to existing Units 6 and 7. Monterey County is the lead agency for the environmental review of these projects. However, the analysis in this document includes a discussion and analysis of any potential cumulative impacts from these projects and appropriate conditions of certification.

FEDERAL, STATE AND LOCAL AGENCY COORDINATION

Extensive coordination has occurred with the numerous local, state and federal agencies that have an interest in the project. Particularly, Energy Commission staff and Duke Energy have worked with the County of Monterey, the California Independent System Operator (Cal-ISO), the Monterey Bay Unified Air Pollution Control District, California Air Resources Board, and the U.S. Environmental Protection agency, California Coastal Commission, California Water Control Board and the Regional Water Quality Control Board to identify and resolve issues of concern. In addition we have coordinated the review and analysis of the project with U.S. Fish and Wildlife Service, Department of Fish and Game, National Marine Fisheries, U.S. Army Corp of Engineers, California Unions for Reliable Energy, and the interested residents of the community.

An important part of our coordination efforts has been with the California Coastal Commission. In accordance with state law, the California Coastal Commission is required to complete an analysis and provide the Energy Commission with their assessment of any power plant proposed in California s coastal zone. Originally the Coastal Commission had planned to complete its report and provide it to the Energy Commission prior to the PSA so that it could be incorporated into the document. For a variety of reasons this optimistic schedule did not occur and we are now hopeful that the report can be received prior to evidentiary hearings.

PROJECT DESCRIPTION

The existing Moss Landing Power Plant is an extensive industrial complex of 7 electric generation units, 10 225-foot exhaust stacks, 19 fuel storage tanks, 2 seawater inlet and out fall structures, various warehouse and office buildings, and other related equipment on a 239-acre site. The power plant has been generating electricity since 1950. Units 1-5 (613 MWs), originally built in the 1950 s was shut down in 1995. Units 6 and 7 (1,500 MWs), are currently in operation. On July 1, 1998, Duke Energy purchased the 239-acre site from PG&E. PG&E retained the adjacent 500/230/115-kV substation.

The project is proposed to be located at the existing Moss Landing Power Plant site. This site is located about 12 miles northwest of Salinas, California in Monterey County at the intersection of Highway 1 and Dolan Road, east of the community of Moss Landing. The plant is situated near the Moss Landing Harbor in an area that includes industrial facilities, agricultural lands, spare residences, recreational beaches and tidal wetlands. The site is bordered by Highway 1 and the Moss Landing Harbor on the west, Dolan Road and Moro Cojo Slough on the south, and Elkhorn Slough including the Elkhorn Slough National Estuarine Research Reserve to the north.

The project, as originally proposed by Duke Energy, consisted of replacing the existing electric power generation Units 1-5 with two 530 MW, natural gas-fired, combined cycle, units. Each combined cycle unit consists of two natural gas fired combustion turbine generators (CTGs), two unfired heat recovery steam generators (HRSGs) and a reheat, condensing steam turbine generator (STG). Each combined cycle unit will use seawater for once through cooling. Duke Energy also proposed to upgrade each of the existing Units 6 and 7 by replacing the high pressure rotors and increasing the steam flow rate. This would have produced 146 MWs (73 MWs each) of additional capacity. These originally proposed changes totaled 1,206 MWs (530 + 530 + 73 + 73 MWs). In addition, they plan to dismantle 8 of the existing 225-foot stacks that were previously used for Units 1-5.

In a supplement to the AFC, Duke Energy dropped the upgrade to Units 6 and 7. The project that is now under the Energy Commission s jurisdiction is 1,060 MWs in size.

There are no linear facilities outside the property owned by Duke Energy and the adjacent PG&E substation. The natural gas pipeline connection, interconnection to the PG&E substation, ocean water intake are all contained on these two adjacent properties.

- The two new electric generating units will supply an additional 1060 MW of electricity to the 230-kV transmission system and through the 230/115-kV transformer into the 115-kV system at the PG&E substation located at the site. An additional 30 MW from Units 6 and 7 will be added to the 500-kV system.

- Natural gas is available on site and a short line will be constructed to the two new units.
- Duke Energy proposes to modify the existing seawater once-through cooling intake structure by installing new traveling screens near the shoreline of the Moss Landing Harbor.
- The new units will use the existing Units 6 and 7 waste water discharge. This will require some onsite modifications to the out fall line.

In addition, Duke will be removing the large fuel storage tanks on site and adding SCR (air emission control technology) to existing Units 6 and 7. Monterey County is the lead agency for the environmental review of these projects but the analysis in this document includes a discussion and analysis of any potential cumulative impacts from these projects.

If the project were to be approved by the Energy Commission, construction is expected to begin immediately after the decision and will take about 29 months. Full-scale commercial operation is expected by mid 2002. Duke Energy expects a peak work force of approximately 732 craft laborers, supervisory, support and construction management personnel on the site during construction. The capital cost of the project is estimated to be about $475 million.

PROJECT DESCRIPTION Figure 1 - NOT AVAILABLE IN ON LINE VERSION
Regional Setting

PROJECT DESCRIPTION Figure 2 - NOT AVAILABLE IN ON LINE VERSION
Local Setting

NEED CONFORMANCE

Jeff Ogata

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

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

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

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

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

AIR QUALITY

Matt Layton

INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the construction and operation of the proposed combined cycle units at the Moss Landing Power Plant (MLPP). Criteria air pollutants are defined as those for which a state or federal ambient air quality standard has been established to protect public health. They include nitrogen dioxide (NO2), sulfur dioxide (SO2), carbon monoxide (CO), ozone (O3), volatile organic compounds (VOC) and particulate matter less than 10 microns in diameter (PM10).

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

- whether the combined cycle units at the Moss Landing Power Plant are likely to conform with applicable Federal, State and Monterey Bay Unified Air Pollution Control District air quality laws, ordinances, regulations and standards, as required by Title 20, California Code of Regulations, section 1742.5 (b),
- whether the combined cycle units at the Moss Landing Power Plant are likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards, as required by Title 20, California Code of Regulations, section 1742 (b), and
- whether the mitigation proposed for the combined cycle units at the Moss Landing Power Plant are adequate to lessen the potential impacts to a level of insignificance, as required by Title 20, California Code of Regulations, section 1744 (b).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Under the Federal Clean Air Act (40 CFR 52.21), there are two major components of air pollution law, New Source Review (NSR) and Prevention of Significant Deterioration (PSD). NSR is a regulatory process for evaluation of those pollutants that violate federal ambient air quality standards. Conversely, PSD is a regulatory process for evaluation of those pollutants that do not violate federal ambient air quality standards. The NSR and PSD analyses has been delegated by the Environmental Protection Agency (EPA) to the Monterey Bay Unified Air Pollution Control District (District). Additionally, the District s NSR program has been designated equivalent to PSD. The NSR permit will serve as the PSD permit. The PSD requirements apply only to those projects (known as major sources) that exceed 100 tons per year for any pollutant.

STATE

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

LOCAL

The proposed project is subject to the Monterey Bay Unified Air Pollution Control District (District) rules and regulations. The rules and regulations are discussed in the Preliminary Determination of Compliance (PDOC) issued January 7, 2000 (District 2000a). Rules that apply to the MLPP are summarized here for convenience.

DISTRICT RULE NO. 200 PERMITS REQUIRED

New emission sources shall obtain a separate written authority to construct for each permit unit from the Air Pollution Control Officer. An authority to construct shall remain in effect until the permit to operate the equipment for which the application was filed is granted or denied or the application is cancelled. Duke Energy Moss Landing LLC has applied for and will be issued Authorities to Construct (ATCs) for the installation and temporary operation of this equipment. Upon completion of initial compliance testing, Permits to Operate (PTOs) will be issued.

DISTRICT RULE NO. 203 APPLICATION

Duke Energy Moss Landing LLC supplied separate applications for each permit unit and utilized the District s permit application forms as required by this Rule.

DISTRICT RULE NO. 205 PROVISION OF SAMPLING AND TESTING FACILITIES

The permits will include conditions establishing sampling facilities as required by this Rule.

DISTRICT RULE NO. 206 STANDARDS FOR GRANTING APPLICATIONS

The Air Pollution Control Officer shall not issue an Authority to Construct or Permit to Operate unless the applicant has shown that the equipment may be expected to operate without emitting air contaminants in violation of Section 41700, 41701, or 44300 (et.seq.) of the Health & Safety Code, or of the District Rules and Regulations. Prior to issuing the PTO, the District will verify that the equipment has been installed pursuant to the ATC.

DISTRICT RULE NO. 207 REVIEW OF NEW OR MODIFIED SOURCES

This rule requires that the project be publicly noticed prior to issuance of the permits, and identifies the BACT and offset provisions. The permits will be conditioned such that compliance with the emission limits established by this Rule will be continuously monitored.

SECTION 4.1 - BEST AVAILABLE CONTROL TECHNOLOGY

Best Available Control Technology is defined as: a) has been contained in any State Implementation Plan and approved by EPA; b) the most stringent emission limitation or control technique that has been achieved in practice for a class of source, or c) any other emission limitation or control technique which the District s Air Pollution Control Officer (APCO) finds is technologically feasible and is cost effective. BACT will apply to any air pollutant that results in an emissions increase of 150 pounds per day for NOx as NO2, SOx as SO2, and Total Suspended Particulates (TSP); of 550 pounds per day of CO; or 82 pounds per day of PM10.

SECTION 4.2 - OFFSETS

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

- Volatile organic compounds - 150 lbs/day
- Oxides of nitrogen - 150 lbs/day
- Sulfur oxides - 150 lbs/day
- Carbon Monoxide - 150 lbs/day
- Total Suspended Particulates - 150 lbs/day
- Particulate Mater less than 10 microns - 82 lbs/day

The emission offsets provided shall be adjusted according to the distance of the offsets from the MLPP. The ratios range from 1:1 to 2.5:1, depending on the relative offset location, air pollutant attainment status, and interpollutant trading.

DISTRICT RULE NO. 208 STANDARDS FOR GRANTING PERMITS TO OPERATE

This rule contains the criteria by which the District issues Permits to Operate (PTOs) to replace Authorities to Construct.

DISTRICT RULE NO. 213 CONTINUOUS EMISSIONS MONITORING

The requirements of this Rule are applicable to all of the combustion equipment contained in these applications, such that CEMs will be installed, calibrated, maintained, and operated in accordance with EPA standards.

DISTRICT RULE NO. 214 BREAKDOWN CONDITIONS

This is the implementing regulation in which the District has established the criteria for reporting breakdowns.

DISTRICT RULE NO. 218 TITLE V: FEDERAL OPERATING PERMITS

The permits will be conditioned such that the facilities Title V permit must undergo a Major Modification prior to combusting fuel in the gas turbines. Upon completing this Title V permit issuance for this Major Modification , the facility will be in compliance with the requirements of this Rule.

DISTRICT RULE NO. 219 TIT LE IV: ACID DEPOSITION CONTROL

The facility is presently an Acid Rain source, and will remain so after this project. The District s Acid Rain permits are incorporated into a facilities Title V Permit.

DISTRICT RULE NO. 400 V ISIBLE EMISSIONS

The equipment can not exceed the 20% opacity standard.

DISTRICT RULE NO. 402 N UISANCES

A person shall not discharge from any source whatsoever such quantities of air contaminants which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public. Appropriate conditions will be included on the permits to ensure compliance with the requirements of this Rule.

DISTRICT RULE NO. 403 P ARTICULATE MATTER

The 0.15 grains per dry standard cubic foot emission limit is applicable to the Gas Turbines at the facility, but this standard is superseded by the emission limitations imposed through the NSR (Rule 207) permitting process.

DISTRICT RULE NO. 404 S ULFUR COMPOUND AND NITROGEN OXIDES

The Gas Turbines are subject to BACT limits imposed by Rule 207 and are therefore exempt from the requirements of this Rule.

DISTRICT RULE NO. 412 S ULFUR CONTENT OF FUELS

This rule requires that the sulfur content of any gaseous fuel combusted contain 50 grains or less of sulfur per 100 cubic feet.

DISTRICT RULE NO. 421 V IOLATIONS AND DETERMINATION OF COMPLIANCE

This Rule provides standards for compliance determinations required by, or derived from federal law.

DISTRICT RULE NO. 423 N EW SOURCE PERFORMANCE STANDARDS (NSPS)

40 CFR Part 60, Subpart A - General Provisions. The facility is subject to the requirements of this part because the equipment is subject to 40 CFR Subpart GG.

The notification and record keeping, performance tests, compliance with standards and maintenance requirements, circumvention, monitoring requirements, and general notification and reporting requirement provisions contained in ⁄⁄60.7, 60.8, 60.11, 60.12, 60.13, and 60.19 will be subsumed under the testing, monitoring, reporting requirements established as conditions on this permit pursuant to District requirements. This will include initial testing, annual testing, record keeping, reporting, and the requirement to monitor operations with the use of CEMs.

40 CFR Part 60, Subpart GG -Standards Of Performance For Stationary Gas Turbines. The Gas Turbines are subject to the requirements of this NSPS. In addition to utilizing good combustion practices and combusting only natural gas, the Gas Turbines utilize dry-low NOx combustors, and the back-end control of SCR to

limit pollutant emissions. The allowable NOx concentration limit derived from ⁄60.332(a)(1) would be 141 ppmvd.

The allowable SO2 concentration limit derived from ⁄60.333 would be 150 ppmv.

The testing and monitoring requirements contained in ⁄⁄60.334 and 60.335 will be subsumed under the testing and monitoring requirements established under the NSR conditions contained on the permits. This will include the annual emissions testing requirement and the requirement to monitor operations with the use of CEMs.

DISTRICT RULE NO. 424 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS)

40 CFR Part 61, Subpart A -General Provisions. The facility is subject to the requirements of this part because the facility is subject to 40 CFR Part 61, Subpart M.

40 CFR Part 61, Subpart M -National Emission Standard For Asbestos
The facility is subject to the requirements of 61.145 - 61.147, Standards for Demolition and Renovation.

DISTRICT RULE NO. 431 EMISSIONS FROM ELECTRIC POWER BOILERS

This rule establishes numerous requirements on Boilers 6-1 and 7-1 at the Moss Landing Power Plant. Included in these requirements is the elimination of fuel oil as a primary fuel (allowed only for emergency use) and a NOx limit of 10 ppm when combusting gaseous fuels with future effective dates of December 31, 2000 for the first unit and December 31, 2001 for the second unit.

The elimination of fuel oil and the 10 ppm NOx limit when combusting gaseous fuels established the methodology for calculating both the historical (baseline) emissions for the facility, and the future potential to emit of Boilers 6-1 and 7-1. In calculating the baseline for the facility, the District utilized the natural gas emission factors including this 10 ppm NOx limit for the heat input from the fuel oil combusted during the baseline period.

ENVIRONMENTAL SETTING

METEOROLOGICAL CONDITIONS

The semi-permanent Pacific High over the eastern Pacific Ocean dominates the climate at the project site. During the summer months, the high blocks low pressure systems from passing through the Monterey Bay area. The summer is typically mild with little precipitation. The onshore airflow typical in the summer over the cool ocean waters results in the fog and clouds common along the Northern California coast. On an annual basis, the onshore winds from the western quadrant, occur 39% of the time (MLPP 1999a and 1999b).

During the winter months, the Pacific High weakens and migrates to the south allowing Pacific storms into California. Most of the annual rainfall of 20 inches occurs between November and March. During the winter, winds from the east are more frequent, resulting from land temperature being cooler than the ocean temperatures. Annual wind roses can be found in the Application for Certification (MLPP 1999a) and quarterly wind roses can be found in the data responses (MLPP 1999b).

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

EXISTING AIR QUALITY

The Federal Clean Air Act and the California Air Resources Board (CARB) both required the establishment of allowable maximum ambient concentrations of air pollutants, called ambient air quality standards (AAQS). The state AAQS, established by CARB, are typically lower (more protective) than the federal AAQS, which are established by the federal Environmental Protection Agency (USEPA). The state and federal air quality standards are listed in AIR QUALITY Table 1. As indicated in AIR QUALITY Table 1, the averaging times for the various air quality standards (the duration over which they are measured) range from one-hour to an annual average. The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per a volume of air, in milligrams or micrograms of pollutant in a cubic meter of air (mg/m3 and μg/m3).

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

AIR QUALITY Table 1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O3)	1 Hour	0.12 ppm (235 $\mu g/m^3$)	0.09 ppm (180 $\mu g/m^3$)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO2)	Annual Average	0.053 ppm (100 $\mu g/m^3$)	---
	1 Hour	---	0.25 ppm (470 $\mu g/m^3$)
Sulfur Dioxide (SO2)	Annual Average	80 $\mu g/m^3$ (0.03 ppm)	---
	24 Hour	365 $\mu g/m^3$ (0.14 ppm)	0.04 ppm (105 $\mu g/m^3$)
	3 Hour	1300 $\mu g/m^3$ (0.5 ppm)	---
	1 Hour	---	0.25 ppm (655 $\mu g/m^3$)
Respirable Particulate Matter (PM10)	Annual Geometric Mean	---	30 $\mu g/m^3$
	24 Hour	150 $\mu g/m^3$	50 $\mu g/m^3$
	Annual Arithmetic Mean	50 $\mu g/m^3$	---
Sulfates (SO_4)	24 Hour	---	25 $\mu g/m^3$
Lead	30 Day Average	---	1.5 $\mu g/m^3$
	Calendar Quarter	1.5 $\mu g/m^3$	---
Hydrogen Sulfide (H_2S)	1 Hour	---	0.03 ppm (42$\mu g/m^3$)
Vinyl Chloride (chloroethene)	24 Hour	---	0.010 ppm (26 $\mu g/m^3$)
Visibility Reducing Particulates	1 Observation	---	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

The MLPP is located in the Monterey County portion of the Northern Central Coast Air Basin and, as stated above, is under the jurisdiction of the Monterey Bay Unified Air Pollution Control District. The District collects ambient air quality data at monitoring sites throughout the air basin. The data is used to determine attainment status and define air quality trends. This area is designated attainment for the state s CO, NO2, SO2, SO4 and lead standards, and attainment for the federal SO2 standard, and unclassified/attainment for the federal CO and NO2 standards (ARB 1999).

In part of 1993 and 1994, the District established the Moss Landing Air Monitoring Program (Moss 1996) that collected meteorological and ambient air quality data (including NO2, NOx, PM10, PM2.5, fallout type particulate — FTP) and in the

vicinity of the MLPP, in response to local citizen complaints. The five monitoring sites were located to the east, west, and south of the operating Moss Landing Power Plant and the National Refractories and Minerals facilities.

The year long monitoring program concluded that local ambient PM10 data were dominated by sea salts, soils, or soot from the wildfires in Malibu — local industries did not contribute significantly to PM10 concentrations. There was some correlation of FTP episodes (acidic iron particles 50 micron and larger) with the use of fuel oil at the Moss Landing Power Plant, but FTP was not considered a health hazard as it is not inhalable. The data did not demonstrate a significant relationship between fuel use at the two industrial facilities and ambient NOx measurements. The program found ambient levels very low, with local vehicle traffic tending to dominate the diurnal patterns of NO and NO2.

AMBIENT OZONE

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants. Nitrogen oxides (NOx) and hydrocarbons (Volatile Organic Compounds [VOCs]) interact in the presence of sunlight to form ozone. The reaction can take several hours to occur, so ozone generally forms downwind and/or lags the timing of the emissions peaks.

The area was redesignated to federal maintenance area in 1997 based on attaining the 1-hour ozone standard in 1990 and submitting a Maintenance Plan in 1994 (District 1999b). The area is non-attainment of the state 1-hour ozone standard, as shown by the data in AIR QUALITY Table 2. Salinas is a close ambient air monitoring stations, but the Hollister station is also representative of the more regional characteristics of ozone.

AIR QUALITY Table 2
North Central Coast Air Basin State 1-hour Ozone Ambient Air Quality Data (ppm)

Monitoring Station	1-hour Measurements	1995	1996	1997	1998	1999
Salinas — Natividad Rd.	Max. concentration (ppm)	0.06	0.07	0.06	0.06	0.06
	# days exceed standard	0	0	0	0	0
Pinnacles National Monument	Max. concentration (ppm)	0.14	0.12	0.11	0.12	0.06
	# days exceed standard	6	14	1	6	0
Hollister - Fairview Rd.	Max. concentration (ppm)	0.1	0.1	0.08	0.11	0.08
	# days exceed standard	1	3	0	5	0
California Ozone Ambient Air Quality Standard: 0.09 ppm (1-hour average)						

Source: ARB 1999

In the most recent ARB report on the contribution of various districts to ozone violations in other districts (ARB 1996), the San Joaquin Valley Air Basin and the San Francisco Bay Area contribute measurably to ambient ozone levels in the North Central Coast Air Basin, a downwind district. Given that the measured ozone

violations occur in Hollister and Pinnacles, which are near these contributing air basins, it is likely that some of the ozone violations in the District may be due to transported air pollutants. This widespread contribution from one geographic area to another demonstrates the regional and temporal nature of the ozone problem and ozone formation.

AMBIENT PM10

PM10 can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NOx, SOx and VOC from turbines, and NH3 from NOx control equipment can, given the right meteorological conditions, form particulate matter known as nitrates (NO3), sulfates (SO4), and organics. These pollutants are known as secondary particulates, because they are not directly emitted but are formed through complex chemical reactions in the atmosphere.

PM10 ambient air quality data presented in AIR QUALITY Table 3 shows that there have been violations of the state 24-hr standard. The basin has not recently experienced any violations of the state and federal annual and the federal 24-hour PM10 ambient air quality standards. Therefore, the area is non-attainment of the state PM10 24-hour standard, and attainment of the state and federal annual, and the federal 24-hour PM10 standards.

AIR QUALITY Table 3
State 24-hour PM10 Ambient Air Quality (μg/m3)

Monitoring Station	Standard	1995	1996	1997	1998	1999	CAAQS
Moss Landing Sandholt Rd.	24-hour	---	---	91	52	43	50
	# of days above [a]	---	---	7	1	---	---
Watsonville Airport Blvd.	24-hour	42	44	35	46	46	50
	# of days above	0	0	0	0	0	---
Salinas [b] Natividad Rd.	24-hour	50	50	59	52	39	50
	# of days above	0	0	1	1	0	---

a. PM10 measurements only occur every 6 days, so the actual number of days that violate the standard can be 6 times greater than the number shown here.
b. Salinas is the most representative ambient air monitoring station. Sea salt and sand dominate the PM10 readings at the Moss Landing station.

Sources: Moss 1996, ARB 1999, District 1999a

As part of their planning and monitoring efforts, the District initiated speciation studies of PM10 measurements from the ambient air monitoring stations at Moss Landing (District 1999a and Moss 1996). The studies found that sea salt was the overwhelming contributor to the PM10 measurements in the Moss Landing area. The results were similar to that of the Davenport air monitoring station, also located on the coastline and studied in the same 1999 report. Therefore, Staff believes that the Moss Landing PM10 measurements are not representative of the highest anthropogenic (man-made) PM10 measurements for the region. The ambient air

monitoring station in Salinas will be used as representing the worst case PM10 measurements for the district. While Salinas only measured one day over the State 24-hour PM10 standard in 1997 and again in 1998, the actual number of days over the standard could be six times as high since the measurements only occur every six days.

PROJECT DESCRIPTION AND EMISSIONS

The present MLPP consists of seven generating units, 10 exhaust stacks, 19 fuel oil tanks, and 2 seawater intake and outfall structures. The applicant proposes to replace 5 of the existing boiler units with four combined cycle combustion turbine generator sets. The new combustion turbines will exhaust to four un-fired heat recovery steam generators, which supply steam to two steam turbines with once-through seawater cooled condensers.

Existing boiler Units 6 and 7 will continue to operate, with some outage time for the SCR retrofit, during construction of the four combustion turbine combined cycle units. Baseline emissions calculations after the installation of SCR will be used to generate emission reductions to offset some of the air emissions from the new combined cycles.

CONSTRUCTION

The construction of the new combustion turbine combined cycle power plant will include the following ancillary facilities and activities:

- Preparation of construction laydown and parking areas,
- Construction of cooling seawater pipeline from the new MLPP to the existing once-through seawater cooling intake structure for decommissioned Units 1 - 5,
- Construction of cooling seawater pipeline to the existing once-through seawater cooling outfall structure Units 6 and 7, and
- Construction of a natural gas pipeline to existing pipelines.

Additional construction activities will be occurring on-site, either in series or parallel with the construction activities associated with the combustion turbines. These include:

- Demolition of the existing 19 fuel oil tanks;
- Demolition of eight 225-foot stacks associated with Units 1 - 5;
- Installation of selective catalytic reduction systems in existing Units 6 and 7;
- Replacement of the high pressure steam turbine rotors on existing Units 6 & 7;
- Construction of an ammonia unloading facility and ammonia tank farm for the SCR systems for the four combustion turbines and Units 6 and 7.

All of the ancillary facilities and activities described above are within the existing plant fenceline.

PROJECT SITE

The combustion turbine combined cycle power plants will take approximately two and half years to construct. The power plant project construction itself consists of three major areas of activity: 1) the civil/structural construction 2) the mechanical construction, and 3) the electrical construction. The largest air emissions are generated during the civil/structural activity, where work such as grading, site preparation, foundations, underground utility installation and building erection will occur. These types of activities require the use of large earth moving equipment, which generate considerable combustion emissions themselves, along with creating fugitive dust emissions. The mechanical construction includes the installation of the heavy equipment, such as the combustion and steam turbines, the heat recovery steam generators, condenser, pumps, piping and valves.

Although not a large fugitive dust generation activity, the use of large cranes to install such equipment generates significantly more emissions than other construction equipment onsite. Finally, the electrical equipment installation occurs, involving such items as transformers, switching gear, instrumentation and wiring, and are relatively small emissions generating activities in comparison to the early construction activities. Not surprisingly, the largest level of construction emissions for the project will occur from the project site activity, most of it due to earth moving and grading activities and large crane operations. The construction of facilities will generate air emissions, primarily fugitive dust from earth moving activities and combustion emissions generated from the construction equipment and vehicles.

The projected highest daily emissions, based on the highest monthly emissions over the 29 month construction activity are shown in AIR QUALITY Table 4. It should be noted that the emissions shown in Table 4 will likely not occur on one single day. For example, the highest NOx emissions for the project site activity occur during month 6, while the highest PM10 emissions for the project site activity occur during month 2.

AIR QUALITY Table 4
Maximum Daily Combustion Turbine Construction Emissions (lbs/day)

Activity/Emission [a]	NOx	VOC	CO	PM10	SOx
Project Site [b]	201.1	53.5	719.7	46.0	7.6
Worker travel, deliveries	131.1	91.1	1094.9	1.2	2.4
Totals	332.2	144.6	1814.6	47.2	10

a. All emissions activities based on an 10-hour workday
b. Maximum daily emissions include site construction and pipeline activities.

Source: MLPP 1999a

SEAWATER AND NATURAL GAS PIPELINES

The construction of the seawater intake and outfall water connection, and the natural gas pipelines includes activities such as clearing and grading, trenching, stringing the pipes and fittings, lining and connecting, and backfill and clean-up.

The emissions generating equipment from these activities are included in the emissions in AIR QUALITY Table 4.

TANK AND STACK DEMOLITION

The applicant is proposing that the tank farm demolition take about 18 months. The demolition will begin before the construction of the combined cycles, but will overlap some combined cycle construction activities by about 9 months. Air emissions for the tank demolition activities are shown in AIR QUALITY Table 5. The six month stack demolition is scheduled to begin after the commissioning of the combined cycles, and should not overlap with any other on-site activities (MLPP 1999b). Therefore, the emissions, which are less than for the other construction activities, are not shown on AIR QUALITY Table 5.

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

Activity/Emission [a]	NOx	VOC [c]	CO [c]	PM10	SOx [c]
Tank demolition [b]	402	---	---	28	---
SCR installation	816	---	---	57	---
Worker travel, deliveries	NA [c]	---	---	NA [c]	---
Fugitive Dust	NA [c]	---	---	NA [c]	---
Totals		---	---		---

a. All emissions activities based on an 10-hour workday
b. Stack demolition is not included here as it does not overlap with other contruction activities.
c. Emissions data not provided for these categories or pollutants.

Source: MLPP 2000

SCR INSTALLATION FOR UNITS 6 AND 7

The applicant is proposing to install the SCR systems in Unit 6 and then Unit 7, over a 12 month period. The SCR installation activities will overlap much of the early construction activities for the combustion turbines ((MLPP 1999b). Some of the expected air emissions for the SCR installation are shown in AIR QUALITY Table 5.

AMMONIA FACILITY

The ammonia unloading facility and ammonia tank farm are integral parts of the SCR retrofit of Units 6 and 7 and the new combustion turbines. The air emissions from the construction of the ammonia unloading facility and tank farm are included in the construction emissions in AIR QUALITY Tables 4 and 5.

OPERATIONAL PHASE

EQUIPMENT DESCRIPTION

- The major components of the MLPP consists of the following:

- Four combustion turbine generators (CTG), using the General Electric Model 7FA, model PG7241, nominally rated at 171.9 MW. Each of the CTGs would be equipped with evaporative inlet air coolers;
- Four unfired heat recovery steam generators (HRSG) and ancillary equipment; and
- Two steam turbines with seawater cooled condensors, each rated at 195.3 MW;
- The existing steam boilers, Units 6 and 7 consist of:
- Two boilers, each rated at 6,662.5 MMBtu/hour;
- Two steam turbines, each rated at 1515 MW after the steam rotor replacement; and
- Seawater cooling intake and outfall structures.

EQUIPMENT OPERATION

The new CTGs and existing boilers will burn only natural gas, and there are no provisions for an alternative back-up fuel.
The applicant is requesting that the combined cycle projects be analyzed with the assumption of 4 hours of start-up per day, and 400 hours of start-up per turbine each year. There are various durations of start-up of the CTGs, depending on length of time that the turbine has been shutdown and the temperatures and pressures on the steam turbine side of the power generation block, so the exact number of start-ups that correlates to 400 hours is not certain. Because of the thermal efficiency of the project, it is highly likely that the combustion turbines will operate extensively, therefore extended shutdowns are not likely to occur. The expected capacity factors of the combustion turbine units will be close to 100 percent.

The usual practice is to define start-ups as either a hot start, a warm start or a cold start, with the start-up period being defined as the length of time until the gas turbine is fully loaded, that is, producing baseload electrical power. A hot start would occur after an overnight turbine shutdown. The duration of a hot start is relatively short, approximately half an hour. A warm start-up is also approximately 30 minutes in duration, although the steam turbine ramping up period would be longer than a hot start. A warm start-up duration would occur after a typical weekend shutdown (approximately 60 to 72 hours). A cold start takes considerably longer, on the order of two hours. However, this type of start-up would be very rare, occurring only after the turbines have been under extended shutdown, such as the annual maintenance inspection that the manufacturer may require.

The proposed capacity factors of Units 6 and 7 will be 80%/80%/100%/100% in Quarters 1 through 4, respectively.

EMISSION CONTROLS

The exclusive use of an inherently clean fuel, natural gas, will limit the formation of SO2 and PM10 emissions. Natural gas contains very small amounts of a sulfur

compound known as mercaptan, which when combusted, results in sulfur compound emissions in the flue gas. However, in comparison to other fuels used in power plants, such as fuel oil or coal, the sulfur dioxide emissions from the combustion of natural gas are very low. A sulfur content of 0.25 grains of sulfur per 100 standard cubic feet of natural gas was assumed for the SO2 emission calculations.

Like SO2, the emissions of PM10 from natural gas combustion are very low compared to the combustion of fuel oil or coal. Natural gas contains very little noncombustible gas or solid residue, and therefore it is a relatively clean-burning fuel.

To minimize NOx, CO and VOC emissions during the combustion process, the GE turbine is equipped with the latest dry low-NOx combustor. A more detailed discussion of this combustion technology is presented in the Mitigation section of this analysis. After combustion, the flue gases pass through the heat recovery steam generator (HRSG), where catalyst systems are placed to further reduce NOx, CO and VOC emissions. MLPP is proposing to use a Selective Catalytic Reduction (SCR) system to reduce NOx emissions. A more complete discussion of these catalyst technologies is included in the Mitigation section.

PROJECT OPERATING EMISSIONS

A single CTG s criteria air pollutant emissions during short periods of time, one hour or less, are shown in AIR QUALITY Table 6. As this table shows, the highest emissions are from the combustion turbine during startup compared to emissions during steady state, full load operation. Most notable, emissions of NOx, VOC and CO are significantly higher during startup. These higher emissions occur because the turbine combustor technology is designed for maximum efficiency during full load steady state operation, not start-up.

AIR QUALITY Table 6
CTG Hourly (unless noted) Emissions (pounds per hour [lbs/hr])

Operational Profile	NOx	SO2	PM10	VOC	CO
CTG Start-up (1 hour)	80	1.2	9	16	902
CTG Start-up (4 hours)	320	---	---	64	3608
CTG Steady State @ 100% load	17.23	1.30	9.0	4.79	25.17

Sources: MLPP 1999a, District 2000

During startup and shutdown, combustion temperatures and pressures are rapidly changing, which results in less efficient combustion and higher emissions. Also, the flue gas controls, the catalyst discussed above, operate most efficiently when the turbine operates near or at full load, at which the catalysts are at or near design temperatures. Those flue gas controls are not as effective during the transitory temperature changes that occur during startup and shutdown. The start-up emissions data reflect information provided by the applicant (MLPP 1999a) that are believed to be most representative of existing and proposed CTG projects.

The daily emissions from the project are shown in AIR QUALITY Table 7. The table shows different operating scenarios, and the resultant emissions, including CTG startup (worst case of 4 hours of start-up) and steady state operation. The highest daily project emissions scenario is presented in the last row of the table. It assumes 4 hours of start-up per each turbine. However, since the start-up of the second set of two CTGs is staggered by 2 hours, this set of CTGs only operates 18 hours for calculating the highest potential daily NOx, CO, and VOC emissions.

AIR QUALITY Table 7
Project Daily Emissions (pounds per day [lbs/day])

Operational Profile	NOx	SO2	PM10	VOC	CO
1 turbine with 4 hours start and 20 hours steady state operation	664.6	31.2	216.0	159.8	4,111.4
1 turbine with 4 hours start and 18 hours steady state operation [a]	630.1	28.6	198.0	150.2	4,061.1
1 turbine with 24 hours steady state operation	413.5	31.2	216.0	115.0	604.1
4 turbines operate full load 24 hours	1,654.1	124.8	864.0	459.8	2,416.3
4-hr start-ups/4 CTGs plus 20 hours/2 CTGs and 18 hours/2 CTGs steady state operation	2,589.4	119.6	828.4	620.0	16,345.0

a. Two CTGs are assumed to start together, while the other two CTGs startup is staggered by 2 hours.

Source: MLPP 1999a and District 2000

Annual emissions are summarized in the AIR QUALITY Table 8. MLPP has requested that the project be analyzed assuming 400 hours of start-ups per turbine per year and 8000 hours of steady state operation per turbine per year. For comparison, staff has presented the scenario of all four turbines operating non-stop throughout the year. The highest annual emissions of SO2 and PM10 would occur with this scenario, since those emissions are a function of the quantity of fuel burned. The annual emissions of NOx, VOC and CO are higher with the inclusion of the start-up emissions. Also included in Table 8 are the typical initial commissioning air emissions, which not surprisingly, are not insignificant in comparison to the likely commercial operation annual emissions. These values need to be refined to reflect actual commissioning activities at the MLPP project site.

AMMONIA EMISSIONS

Due to the large combustion turbines used in this project and the need to control NOx emissions, significant amounts of ammonia will be injected into the flue gas stream as part of the SCR system. Not all of this ammonia mixes in the flue gases to reduce NOx; a portion of the ammonia passes through the SCR and is emitted, unaltered, out the stacks.

AIR QUALITY Table 8

Project Annual Emissions (tons per year [ton/yr])

Operational Profile	NOx	SO2	PM10	VOC	CO
400 hours of start-up and 8000 hours of steady state operation	339.7	21.8	1,124.3	89.4	151.2
Initial Commission Phase — 250 hours of operation (typical [a])	135	NA	20	56	431
a. These emissions data were not provided by the applicant, but are from a similar sized combustion turbine project (La Paloma Generating Project).					

Sources: MLPP 1999a, District 2000a, La Paloma 1999

These ammonia emissions are known as ammonia slip. The District has limited the MLPP to an ammonia slip no greater than 5 ppm, which is the current lowest ammonia slip level being achieved and permitted throughout California. However, the ammonia slip will be limited to approximately 12.73 lbs/hour/CTG, 300.5 lbs/day/CTG, and 1,221.1 lbs/day/project (District 2000b). These limits exclude the start-up periods, when ammonia is generally not injected since the SCR catalysts are not yet at operating temperature.

It should be noted that the ammonia slip of 5 ppm is usually associated with the degradation of the SCR catalyst, usually in a time frame of five years or more after initial operation. At that point, the SCR catalysts are removed and replaced with new catalysts. Through most of the operation of the SCR system, ammonia slip emissions are usually in the range of 1 to 2 ppm, corresponding to a project mass emissions in this case to approximately 400 pounds per day. The implications of these ammonia emissions are discussed later in this analysis.

INITIAL COMMISSIONING PHASE OPERATION AND EMISSIONS

Prior to the first firing of the combustion turbines, a temporary HRSG boilout chemical cleaning boiler may be used, similar to what was done on the La Paloma project. The combustion turbines will then undergo the initial firing and commissioning phase of the project schedule.

Over each commission phase, MLPP will be limited to no more than 250 hour of operation without the SCR system. Additionally, all NOx CO, VOC, PM10 and SO2 will be included in the quarterly emissions. It should be noted that it is in the owner s best interest to minimize this initial commissioning phase in order for the project to be declared ready for commercial operation and thus able to generate revenues. Therefore, it is expected that this initial commissioning phase will, to the extent feasible, be as short as possible and thus minimize the higher than normal operations emissions that are inevitable during the necessary testing.

The District has a rule that at the end of the commissioning period, written results of a source test demonstrating compliance with the permit limits must be submitted within 30 days.

FACILITY CLOSURE

Eventually the MLPP will close, either as a result of the end of its useful life, or through some unexpected situation such as a natural disaster or catastrophic facility breakdown. When the facility closes, then all sources of air emissions would cease and thus all impacts associated with those emissions would no longer occur. If MLPP were to decide to dismantle the project, there would likely be fugitive dust emissions associated with this dismantling effort. The Facility Closure Plan to be submitted to the Energy Commission Compliance Project Manager should include the specific details regarding how MLPP plans to demonstrate compliance with District rules and fugitive dust and construction emission control measures.

PROJECT INCREMENTAL IMPACTS

MODELING APPROACH

The applicant performed an air dispersion modeling analysis to evaluate the project s potential impacts on the existing ambient air pollutant levels, both during construction and operation. An air dispersion modeling analysis usually starts with a conservative screening level analysis. Screening models use very conservative assumptions, such as the meteorological conditions, which may or may not actually occur in the area. The impacts calculated by screening models, therefore, can be double or more than the actual or expected impacts. If the screening level impacts are significant, refined modeling analysis is performed. A major difference in the refined modeling is that hour-by-hour meteorological data collected in the vicinity of the project site is used. The Industrial Source Complex Short-Term model, Version 3, known as the ISCST3 model, was used for the refined modeling.

CONSTRUCTION IMPACTS

MLPP performed air dispersion modeling analyses of the potential construction impacts at the project site. Not included in this modeling is the potential for cumulative impacts from the construction activities associated with the SCR installation and the tank farm demolition, during those time periods when the activities overlap. Staff is pursing additional information for these overlapping construction activities and will evaluate the need for additional modeling prior to the Final Staff Assessment.

The analyses included fugitive dust generated from the project site construction activity (modeled as an area source) and combustion emissions from the equipment (modeled as an area source). The emissions used in the analysis were the highest emissions of a particular pollutant during a one month period, converted to a gram per second emission rate for the model. Most of the highest emissions occurred early in the 29-month construction period. The results of this modeling effort are shown in AIR QUALITY Table 9. They show that the construction activities would further exacerbate existing violations of the state 24-hour and annual average PM10 standards.

These predicted impacts are of such a high magnitude for a number of reasons. First, the model itself calculates impacts that are very conservative, usually exceeding actual impact levels by a considerable margin. Second, some of the sources of combustion emissions (the bulldozers and trucks) are mobile sources, not stationary sources as input into the model. Therefore, as mobile sources, the air quality impacts would not always be at the same locations, so the model results are overstated. Fourth, it was assumed that all the equipment identified for the modeling evaluation would be running simultaneously. It is doubtful that all the major equipment would all be operating at one time, and thus the impacts are overstated.

AIR QUALITY Table 9
Maximum Project Site Construction Impacts

Pollutant	Averaging Time	Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Limiting Stnd ($\mu g/m^3$)	Percent of Standard
NO2	1-hour	322.2 [a]	113	436	470	93
	Annual	43.8 [b]	21	65	100	65
CO	1-hour	6,849.2	6,900	13,749	23,000	60
	8-hour	1,812.7	3,222	5,035	10,000	50
SO2	3-hour	75.4	156	231	1300	18
	24-hour	9.7	39	49	130	38
	Annual	2.3	0	2.3	80	2
PM10	24-hour	86.6	59	146	50	292
	Annual [c]	20.7	20.8	42	30	140
	Annual [d]	20.7	21.4	42	50	84

a. Ozone limiting method applied to the one-hour impacts.
b. ARM applied to the annual average, using the default value of 0.75.
c. Annual arithmetic mean, state standard
d. Annual geometric mean, federal standard.

Source: MLPP 1999a, MLPP 1999c

Finally, the emissions inputs to the model were from the highest monthly emissions assumed during the 29 month construction period. The levels of emissions used reflect a period of activity of approximately one year, not the entire construction period. During the other months of construction work, considerably fewer emissions-generating equipment will be used and thus the impacts will be lower.

Although construction of the MLPP and ancillary facilities will result in unavoidable short-term impacts, it is doubtful that the general public would be exposed to the construction impacts associated with the project. This is because of the project s rather isolated location away from any population centers in a heavily industrial area where the impacts would actually occur. Nevertheless, staff believes that the impact from the construction of the project could have a significant and unavoidable

impact on the PM10 ambient air quality standards, and should be avoided or mitigated, to the extent feasible.

PROJECT OPERATION IMPACTS

The air quality impacts of project operation are shown in the following sections for combustion turbine steady-state operations, and the transitory conditions during turbine start-up and the special meteorological conditions associated with fumigation and shoreline fumigation.

STEADY STATE MODELING

MLPP provided a refined modeling analysis, using the ISCST3 model to quantify the potential impacts of the project during normal steady state operation and conditions. The results of this modeling analysis are summarized shown in AIR QUALITY Table 10. The analysis assumes worst case ambient temperatures during steady state operation to predict the highest impacts possible.

COMBUSTION TURBINE START-UP MODELING

MLPP provided a refined modeling analysis, using the ISCST3 model to quantify the potential impacts of the project during start-up conditions. The results of this modeling analysis are summarized in AIR QUALITY Table 10. The start-up emissions for NOx and CO are generally higher since the combustion turbine and downstream components, including the SCR, are not at design (elevated) temperatures. This results in less complete combustion (i.e., increased CO emissions) and relatively uncontrolled NOx emissions.

The modeling assumes these higher emission rates with stack parameters for turbine operation at 50 percent load. The low load conditions can cause higher impacts since the flue gas temperature and velocity are relatively low, resulting in less plume rise away from the facility. This effect can be seen in the calculated SO2 impacts. During start-up, fuel use is still low, resulting in low SO2 emissions rates compared steady state operation. However, the 50 percent stack parameters, result in higher SO2 impacts during start-up than steady state operation.

FUMIGATION MODELING

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

SHORELINE FUMIGATION MODELING

Additionally, fumigation can occur at shorelines due to the stability differences between the cool stable air mass over the water and the less stable air mass over land. Shoreline fumigation tends to occur on sunny days, and generally persists for 90 minutes. The applicant used the SCREEN3 model, which is an EPA approved model, for the calculation of fumigation impacts and shoreline fumigation impacts. The results of the fumigation modeling analyses are summarized in AIR QUALITY Table 10 (MLPP 1999c).

AIR QUALITY Table 10
Summary of Refined Modeling Maximum 1-Hour Impacts

Pollutant	Averaging Time	Maximum Modeled Concentrations (μg/m3)			
		ISCST3	Fumigation	Shoreline Fumigation	Start-ups (Turbines Only)
NO2	1-hour	20.4	28.5	82.8	148.1 [a]
	Annual	0.17	---	---	---
SO2	1-hour	1.33	1.82	7.11	1.90
	3-hour	0.69	1.18	4.05	1.19
	24-hour	0.10	0.53	0.68	---
	Annual	0.0002	---	---	---
CO	1-hour	95.1	152.7	547.5	2,227.5
	8-hour	184.3	29.77	296.1	---
PM10	24-hour	1.83	4.06	5.91	---
	Annual	0.09	---	---	---

a. Using the ozone limiting method.

Source: MLPP 1999c

PROJECT IMPACTS

MLPP provided a refined modeling analysis, using the ISCST3 model to quantify the potential impacts of the project during normal steady state operation and during start-up and fumigation conditions. The results of these modeling analyses were summarized in AIR QUALITY Table 10. Using the highest impacts from AIR QUALITY Table 10 and the highest measured ambient air quality levels, MLPP predicted the worst case impacts for the various operating scenarios for the project. These impacts are shown in AIR QUALITY Table 11

AIR QUALITY Table 11
Combustion Turbine Refined Modeling Maximum Impacts

Pollutant	Averaging Time	Impact ($\mu g/m^3$) [a]	Back-Ground ($\mu g/m^3$) [e]	Total Impact ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Percent of Standard
NO2	1-hour	148.2 [b]	113	261	470	56
	Annual	0.2	21	21.2	100	21
SO2	1-hour	7.1	156	163	655	25
	24-hour	0.7	39	40	109	37
	Annual	0	0	0	80	0
CO	1-hour	2,228	6,900	9,128	23,000	40
	8-hour	296	3,222	3,518	10,000	35
PM10	24-hour	5.9	59	65	50	130
	Annual [c]	0.01	20.8	20.9	30	70
	Annual [d]	0.01	21.4	21.5	50	43

a. The worst case impacts from AIR QUALITY Table 11.
b. Using the ozone limiting method.
c. Annual Arithmetic mean
d. Annual Geometric Mean
e. Background PM10, NO2, CO and SO2 data was collected between 1988 and 1998 at the Salinas ambient air monitoring station

Source: MLPP 1999c

The project s PM10 impacts could contribute to existing violations of the state 24-hour PM-10 standards. The highest 24-hour PM10 impacts (5.9 µg/m3) are relatively large, about 1/10 the state standard itself. Because of the conservatism of the air dispersion model itself, staff believes that the actual impacts from the project would be significantly less than the projected modeled impacts shown in AIR QUALITY Table 11.

The start-up circumstances of the project are such that two combustion turbines will be started simultaneously, and then, two hours later, the last two combustion turbines can be started. There will not be simultaneous start-up of all four turbines. Start-up circumstances can be troublesome for significant air quality impacts for the following reasons. First, emissions (particularly of NOx and CO) can be high and often uncontrolled, because emission control equipment is not operating at optimum temperature ranges. Second, low volumetric flow rates and exhaust gas temperatures can result in low exhaust plume rise and consequently higher ground level impacts.

The modeling results show that the highest short-term impacts on ambient NO2 and CO levels do, indeed, occur during start-up circumstances. The modeling analysis above indicates that during a project start-up scenario, the impacts from that start-up, plus background NO2 ambient levels, would result in the highest impact of the

project on the 1-hour state NO2 standard. This modeling analysis reflected the use of the Ozone Limiting Method (OLM) to provide a more refined estimate of NO2 impacts. The highest SO2 and PM10 impacts occurred during shoreline fumigation conditions.

SECONDARY POLLUTANT IMPACTS

The project s emissions of gaseous emissions, primarily NOx, SO2 and VOC, can contribute to the formation of secondary pollutants, namely ozone and PM10, particularly ammonium nitrate PM10 and sulfate. There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning efforts where hundreds or even thousands of sources are input into the modeling to determine ozone impacts. There are no regulatory agency models approved for assessing single source ozone impacts. However, because of the known relationship of NOx and VOC emissions to ozone formation, it can be said that the emissions of NOx and VOC from the MLPP do have the potential (if left unmitigated) to contribute in some unquantified way to higher ozone levels in the region.

Concerning secondary PM10 (primarily ammonium nitrate) formation, the process of gas-to-particulate conversion is complex and depends on many factors, including local humidity and the presence of other compounds. Currently, there are no agency (EPA or CARB) recommended models or procedures for estimating nitrate or sulfate formation.

Nevertheless, studies during the past two decades have provided data on the oxidation rates of SO2 and NOx. The data from these studies can be used to approximate the conversion of SO2 and NOx to particulate. This can be done by using an aggregate conversion factor (typically about 0.01 to 1 percent per hour) with Gaussian dispersion models such as ISCST3. The model is run with and without chemical conversion (decay factor) and the difference corresponds to the amount of SO2 and NO2 that is converted to particulate. Staff believes that the emissions of NOx from MLPP do have the potential (if left unmitigated) to contribute, to higher secondary PM10 (particularly of ammonium nitrate) levels in the region.

CUMULATIVE IMPACTS

To evaluate reasonably foreseeable future impacts as part of the project impacts analysis, the applicant performed a cumulative modeling analysis (MLPP 1999c). The cumulative analysis included potential and/or permitted projects located up to nine miles from the proposed facility site, which is greater than the six mile radius generally specified by staff. The applicant worked with the District to identify potential and/or permitted projects, and to secure the necessary stack parameters to perform the air dispersion modeling.

The maximum modeled impacts of the combined MLPP project and the potential and/or permitted projects were below allowable District and federal increments. The maximum modeled impacts were above the Prevention of Significant Deterioration (PSD) significance levels for 8-hour CO and 24-hour PM10. However, MLPP s

contribution to the impact was insignificant. Therefore, the operation of MLPP does not cause or contribute to cumulative impacts.

VISIBILITY IMPACTS

A visibility analysis of the project s gaseous emissions is required under the Federal Prevention of Significant Deterioration (PSD) permitting program. The analysis addresses the contributions of gaseous emissions (primarily NOx) and particulate (PM10) emissions to visibility impairment on the nearest Class 1 PSD areas, which are national parks and national wildlife refuges. The nearest Class 1 areas to the MLPP Project are the Ventana Wilderness Area and the Pinnacles National Monument to the south and southeast, respectively. MLPP used the EPA approved model VISCREEN to assess the project s visibility impacts. The results from the VISCREEN modeling analysis indicated that the project s visibility impacts would be below the significance criteria for contrast and perception (MLPP 1999a). Therefore the project s visibility impacts on these Class 1 areas are considered insignificant.

MITIGATION

APPLICANT S PROPOSED MITIGATION

CONSTRUCTION MITIGATION

Moss Landing Power Project is proposing a number of control measures to limit fugitive dust during the construction phase of a project (MLPP 1999a). These include the use of chemical stabilizing agents and dust suppressants or gravel areas on site, and the wetting or covering of stored earth materials on site. These proposed measures also require that the transporting of borrow fill dirt material be wetted, be covered, or sufficient freeboard be allowed. They also require the use of paved access aprons, gravel strips, wheel washing or other means to limit mud or dirt carry-out onto paved public roads.

To minimize combustion emissions such as NOx, CO and PM10, which is not required by District rules, MLPP is proposing to require that contractors: properly maintain vehicle/equipment engines to control exhaust emissions; use low sulfur and low aromatic fuel meeting California standards; and use diesel engines that meet federal emissions standards.

OPERATIONS MITIGATION

The MLPP s air pollutant emissions impacts will be reduced by using emission control equipment on the project and by providing emission offsets. To reduce NOx emissions, MLPP proposes to use dry-low NOx combustors in the CTGs. In addition, an ammonia injection grid will be used in conjunction with a Selective Catalytic Reduction system.

To reduce CO and VOC emissions, MLPP proposes to use good combustion and maintenance practices. PM10 emissions will be limited by the use of a clean

burning fuel (natural gas) and the efficient combustion process of the CTGs. The use of natural gas as the only fuel will limit SO2 emissions.

DRY LO-NOX COMBUSTORS

Over the last 20 years, combustion turbine manufacturers have focused their attention on limiting the NOx formed during combustion. Because of the expense and efficiency losses due to steam or water injection into the combustor cans to reduce combustion temperatures and the formation of NOx, CTG manufacturers are presently choosing to limit NOx formation through the use of dry low-NOx technologies. In this process, firing temperatures remain somewhat low, thus minimizing NOx formation, while thermal efficiencies remain high. At steady state CTG loads greater than 40 percent load, NOx concentrations entering the HRSG are 25 ppm corrected to 15 percent O2. CO concentrations are more variable, with concentrations greater than 100 ppm at 50 percent load, dropping to 5 ppm at 100 percent load.

FLUE GAS CONTROLS

To further reduce the emissions from the combustion turbines before they are exhausted into the atmosphere, flue gas controls, primarily catalyst systems, will be installed in the HRSGs. MLPP is proposing a selective catalytic reduction system to reduce NOx.

SELECTIVE CATALYTIC REDUCTION (SCR)

Selective catalytic reduction refers to a process that chemically reduces NOx by injecting ammonia into the flue gas stream over a catalyst in the presence of oxygen. The process is termed selective because the ammonia reducing agent preferentially reacts with NOx rather than oxygen, producing inert nitrogen and water vapor. The performance and effectiveness of SCR systems are related to operating temperatures, which may vary with catalyst designs. Flue gas temperatures from a combustion turbine typically range from 950 to 1100oF.

Catalysts generally operate between 600 to 750oF (ARB 1992), and are normally placed inside the HRSG where the flue gas temperature has cooled compared to the combustion turbine exhaust. At temperatures lower than 600oF (i.e., during start-up), the ammonia reaction rate may start to decline, resulting in increasing ammonia emissions, called ammonia slip. At temperatures above about 800oF, depending on the type of material used in the catalyst, damage to some catalysts can occur. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or a noble metal are also used. These newer catalysts (versus the older alumina-based catalysts) are resistant to fuel sulfur fouling at temperatures below 770oF (EPRI 1990).

Regardless of the type of catalyst used, efficient conversion of NOx to nitrogen and water vapor requires uniform mixing of ammonia into the exhaust gas stream. Also, the catalyst surface has to be large enough to ensure sufficient time for the reaction to take place. MLPP proposes to use a combination of the dry low-NOx combustors and SCR system to produce an NOx concentration exiting the HRSG stack of 2.5 ppm, corrected to 15 percent excess oxygen averaged over a 1-hour period.

EMISSION OFFSETS

District Rule 207 requires that MLPP provide emission offsets, in the form of emission reductions or banked Emission Reduction Credits (ERC), for the project s emissions increases of NOx, SO2, VOC and PM10. MLPP will also have some emissions reductions from the SCR modification and baseline emissions calculations for Units 6 and 7. Historical emissions at Units 6 and 7 are shown in AIR QUALITY Table 12. These emissions include air emissions during fuel oil firing, and do not include the emissions reductions mandated by District Rule 431

AIR QUALITY Table 12
Moss Landing Historical Air Emissions (tons per year)

	NOx	SO2	CO	VOC	PM10
Unit 6 and 7 Boilers	2,687.9	749.0	5,827.9	201.3	277

Sources: MLPP 1999a and District 2000a

The total potential annual air emissions for the modernized Units 6 and 7 and the new combined cycle turbines are shown in AIR QUALITY Table 13. The table shows the total emissions, less the baseline emissions, at the Moss Landing facility that will require offsets. The baseline emissions are derived from historical capacities of Units 6 and 7, with the new emissions factors for NOx and SOx required by District Rule 431. Implementation of Rule 431 limits NOx emissions to 10 ppm from Units 6 and 7, requiring the installation of SCR. Additionally, Rule 431 prohibits fuel oil firing, hence the significant reduction in SO2 emissions. Offsets for the project s CO emissions are not required since the project will not cause any violations of any CO standard (as shown by modeling) and the area currently does not experience any violations of any CO standard.

AIR QUALITY Table 13
Moss Landing Facility Potential Air Emissions (tons per year)

	NOx	SO2	CO	VOC	PM10
Units 6/7 @ new capacity factors [a]	638.8	36.5	6,435.2	283.5	391.7
New Combined Cycles	339.7	21.8	1,124.3	89.4	151.2
Total proposed facility emissions					
Units 6/7 @ historical capacity factors (baseline) [b]					
Net Increase to be Offset	524.7	32.5	1,731.6 [c]	171.6	265.9

a. Emissions based on full implementation of Rule 431 for NOx and SO2 emission factors and proposed Unit 6 and 7 quarterly capacity factors of 80%/80%/100%/100% for quarters 1 through 4.
b. Emissions based on full implementation of Rule 431 for NOx and SO2 emission factors and Unit 6 and 7 historical 1994 and 1995 annual capacity factors.
c. CO emission will not be offset.

Source: District 2000a

Moss Landing Power Project has identified a number of offsets generated through emission reductions. A summary of the amounts of credits secured and under negotiation is shown in AIR QUALITY Table 14. These include anticipated reductions of emissions from Units 6 and 7 baseline emissions, and banked ERCs from Units 1 — 5 (PG&E ERCs). Significant portions of the offset package are from AERA Energy, located in southern Monterey County, and the Spreckels Industrial Park located near Salinas. MLPP is still negotiating with these entities. Additionally, the District has suggested that the use of the Quebecor ERCs, as an interbasin interpollutant trade, will require an environmental review. Given these uncertainties, the offset package may change significantly.

ADEQUACY OF PROPOSED MITIGATION

CONSTRUCTION MITIGATION

Moss Landing Power Project will be required to comply with the proposed control measures for limiting fugitive dust emissions during construction. In addition, MLPP has proposed that they will require contractors to maintain their vehicles and equipment to limit exhaust emissions, purchase on-road diesel fuel, and use engines that meet federal emission standards for construction equipment. Staff believes that additional measures are necessary to mitigate potential construction impacts (refer to staff proposed mitigation below).

AIR QUALITY Table 14
Emissions Offsets (tons per year)

	NOx	SO2	VOC	PM10
PG&E [a]	52.622	0.846	1.973	4.228
Firestone Tire and Rubber [a]	---	---	18	---
Estate of RE McDonald [a]	1.268	0.009	0.283	0.455
Firestone Business Park [a]	20.169	2.556	187.65	11.178
Spreckels Industrial Park [b]	254.61	35.73	33.93	213.948
AERA Energy [b]	289.678	208.604	5.192	120.925
Quebecor [a c]	---	---	300	---
Total				

a. ERCs currently owned by the project applicant.
b. The applicant and the ERC owner are still in negotiations.
c. The Quebecor ERCs are from an adjacent air basin and air district.

Source: District 2000a

OPERATIONS MITIGATION

EMISSION CONTROLS

Moss Landing Power Project has proposed to limit emissions from the GE combustion turbines to 2.5 ppm at 15 percent O2 over a 1-hour rolling average.

This is compliance with the ARB Power Plant Siting Guidelines and other projects being certified by the Energy Commission.

A potential issue was the need for BACT for CO emissions, and the BACT determination. MLPP proposes a BACT level of 9 ppm without the use of an oxidation catalyst. However, District Rule 207 requires BACT for CO emissions despite the area being in attainment for CO. The ARB Guidelines defines BACT for CO as 6 ppm, but does allow flexibility in areas that are attainment for CO. The District is requiring 6 ppm CO emission limit, @15 percent O2 over a 3 hour rolling average, but has not specified the use an oxidizing catalyst commonly used on combined cycle power plants to achieve CO emissions less than 10 ppm. This issue may not be fully resolved, as questions continue to be raised regarding what BACT is for CO.

Moss Landing Power Project proposes VOC concentrations of less than 3.5 ppm. Subsequent discussions with the District lowered the VOC emission limit to 2.0 ppm @15 percent O2 over a 1 hour rolling average. Again, this is without the specified use of an oxidizing catalyst, which can reduce further VOC emissions.

OFFSETS

With the implementation of District Rule 431 and the operation of the four proposed combustion turbines, NOx and SO2 emissions at the facility will be considerably less than historical emissions from Units 6 and 7 alone. VOC and PM10 emissions will increase compared to historical facility air emissions due too the increased capacity factor of Units 6 and 7 and the new combustion turbines, but the emission increases will be offset (AIR QUALITY Tables 12 and 13). The modeling did not predict any significant air quality impacts from the facility s new potential air emissions, including CO, which is not being offset. MLPP has proposed an offset package that, on a quarterly basis, offsets the potential air emissions increases (District 2000a). However, the ultimate adequacy of the offset package is pending the ongoing negotiations, and the District has not prepared a Condition of Certification requiring the surrender of the specific (or any) ERCs.

STAFF PROPOSED MITIGATION

CONSTRUCTION MITIGATION

The construction modeling did not consider cumulative effects from overlapping construction and demolition activities. Staff intends to work with the applicant, District and the County to analyze potential overlap and air emission impacts.

The modeling assessment for the combined cycle project only, shows that the construction activities and the PM10 from combustion sources used for heavy construction have the potential for causing significant PM10 air quality impacts. The most feasible mitigation measure to limit these emissions is to have fugitive dust measures in place. As stated above, MLPP has proposed a number of control measures that will minimize fugitive dust emissions. Staff proposes that prior to the commencement of construction, that MLPP provide a fugitive dust maintenance plan that specifically spells out the mitigation measures that MLPP will employ to

limit fugitive dust during construction. It is anticipated that the fugitive dust measures be implemented for all construction and demolition activities at the Moss Landing site.

In order to address the PM10 emissions in equipment exhaust, MLPP has proposed that they will require contractors to maintain their vehicles and equipment to limit exhaust emissions, purchase on-road diesel fuel, and use engines that meet federal emission standards for construction equipment. Staff is recommending the use of diesel fuel be limited to no greater than 50 ppm sulfur to achieve further reductions in PM10 and PM10 precursors from construction equipment exhaust. Staff proposes that prior to the commencement of construction, that MLPP provide a construction equipment maintenance plan that specifically spells out the mitigation measures that MLPP will employ to limit construction equipment emissions. It is anticipated that the equipment exhaust mitigation measures be implemented for all construction and demolition activities at the Moss Landing site.

The current California standard for diesel fuel limits sulfur to 500 ppm. California diesel averages 130 ppm sulfur, with some fuel distribution terminals selling 50 ppm or less sulfur diesel fuel. The ARB predicted as much as a 25 percent reduction of directly emitted PM10 and an 80 percent reduction of SO2, a PM10 precursor, with the implementation of the 500 ppm sulfur diesel standard (ARB 1988). Staff believes that the use of 50 ppm sulfur diesel instead of 130 ppm diesel will reduce SO2 emission by as much as 60 percent, and reduce PM10 between 5 percent (Clean 2000) and 10 percent. Reducing sulfur in diesel fuel helps extend engine life by reducing corrosive wear. Additionally, lower sulfur diesel ensures a greater compatibility with post-combustion catalysts and soot filters, if they are appropriate (ARB 1998)

OPERATIONS MITIGATION

Staff is not proposing any additional operational mitigation measures to the project at this time. The offset package needs to be finalized by the time of Commission Hearings for this proceeding.

COMPLIANCE WITH LORS

FEDERAL

The District s NSR permit process, which generated the PDOC (District 2000), is considered by the USEPA equivalent to a Prevention of Significant Deterioration (PSD) permit process. The District is not doing a separate PSD permit review. Based on recent conversations with District and USEPA staff, we do not believe that any significant issues have arisen in the NSR evaluation of the MLPP application that would require a separate PSD application, or cause the PDOC/DOC to be inadequate to meet the requirements of PSD. The District will also issue a Title V permit for the facility upon operation of the project.

STATE

The project, with the anticipated full mitigation (offsets) that will be necessary to secure an Final Determination of Compliance from the Monterey Bay Unified APCD, should comply with Section 41700 of the California State Health and Safety Code.

LOCAL

The District has issued a Preliminary Determination of Compliance (District 2000a). The District plans to issues their Final Determination of Compliance, pending a 30-day public review of the PDOC and completion of negotiations to secure the necessary offsets, or their equivalent, specified in the PDOC. The District has provided conditions of certification in the PDOC, which are included below.

CONCLUSIONS AND RECOMMENDATIONS

The Moss Landing Power Plant project s air quality impacts from directly emitted PM10 and of the ozone precursor emissions of NOx and VOC and PM10 precursors of NOx and SO2 could be significant if left unmitigated. MLPP intends to reduce emissions to the extent feasible and provide emission offsets for their NOx, VOC, SO2 and PM10 emissions.

Based on the District s Preliminary Determination of Compliance, staff concludes that the project will comply with the District s Rules and Regulations. Staff however, cannot recommendation certification of the MLPP project at this time because of the lack of a final emissions offset proposal that meets the requirements of the Public Resources Code Section 25523(d)(2), or a condition of certification requiring the ERCs to be surrendered. Additionally, the cumulative effects of overlapping on-site construction and demolition activities are not fully analyzed.

CONDITIONS OF CERTIFICATION

DETERMINATION OF COMPLIANCE CONDITIONS

CONDITIONS PRIOR TO COMBUSTING FUEL:

AQ-1 Pursuant to the requirements of District Rule 218, Duke Energy Moss Landing LLC shall apply for and receive a revised Title V permit for the Moss Landing Power Plant prior to combusting fuel in the Gas Turbines.

Verification: Verification: The project owner shall provide copies Title V permits to the CEC CPM no later than 30 days after the receipt of the permits from the District.

AQ-2 District-approved continuous emission monitors shall be installed, calibrated, and operational prior to first firing the Gas Turbines. After commissioning of the Gas Turbines, the detection range of these continuous emission monitors shall be adjusted as necessary to accurately measure the normal range of

CO and NOx emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval.

Verification: The project owner shall provide copies of the design drawings of the continuous emission monitor design detail to the CEC CPM at least 30 days prior to commencement of construction of the HRSG and the stack.

AQ-3 Duke Energy Moss Landing LLC shall submit a plan to the District at least 30 days prior to the first firing of the Gas Turbines. This plan shall describe the procedures to be followed during the commissioning of the Gas Turbines, the HRSGs, and the Steam Turbines. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the dry-low-NOx combustors, the installation and operation of the SCR systems, and the installation, calibration, and testing of the CO and NOx continuous emission monitors, and any activities requiring the firing of the Gas Turbines without abatement by the SCR Systems. The plan shall include a quantification of emissions during commissioning and use of a HRSG chemical cleaning boiler.

Verification: The project owner shall provide a Commissioning Plan for approval to the CEC CPM and the District at least 60 days prior to first firing of the combustion turbines.

AQ-4 No later than seven (7) days prior to combusting fuel in the Gas Turbines, Duke Energy Moss Landing LLC shall notify the District and arrange for an inspection of the equipment.

Verification: The project owner shall provide copies of the notification to the CEC CPM.

TURBINE COMMISSIONING CONDITIONS:

AQ-5 Duke Energy Moss Landing LLC shall minimize emissions from the Gas Turbines to the maximum extent possible during the commissioning period.

Verification: See Condition AQ-3.

AQ-6 At the earliest feasible opportunity in accordance with the recommendation of the equipment manufacture, the combustors of the Gas Turbines shall be tuned to minimize emissions.

Verification: See Condition AQ-3.

AQ-7 At the earliest feasible opportunity in accordance with the recommendations of the equipment manufactures, the SCR Systems shall be installed, adjusted, and operated to minimize the emissions of nitrogen oxides and ammonia from the Gas Turbines.

Verification: See Condition AQ-3.

AQ-8 The total number of firing hours of each Gas Turbine without abatement of nitrogen oxide emissions by the SCR System shall not exceed 250 hours during the commissioning period. Such operation of the Gas Turbine without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR System in place. Upon completion of these activities, Duke Energy Moss Landing LLC shall provide written notice to the District and the unused balance of the 250 firing hours without abatement will expire.

Verification: See Condition AQ-3.

AQ-9 The total mass emissions of nitrogen oxides, carbon monoxide, volatile organic compounds, PM10, and sulfur dioxide that are emitted from each Gas Turbine during the commissioning period shall accrue towards the quarterly emission limits specified in Condition 25.

Verification: See Condition AQ-3.

AQ-10 At the end of the commissioning period, Duke Energy Moss Landing LLC shall conduct a District and CEC approved source test to determine compliance with Condition 15 (start-up and shutdown limits), and the written test results of the performance tests shall be provided to the District and the CEC within thirty (30) days after the testing. The source test shall determine NOx, CO, and VOC emissions during start-up and shutdown of the Gas Turbines. The source test for each Gas Turbine shall include a minimum of three start-up and three shutdown periods. A complete test protocol shall be submitted to the District no later than thirty (30) days prior to testing, and notification to the District at least ten (10) days prior to the actual date of testing shall be provided so that a District observer may be present. Changes to the test date made subsequent to the initial ten day notification may be communicated by telephone or other acceptable means no less than forty-eight (48) hours prior to the new test date.

Verification: A complete test protocol shall be submitted for approval to the District and the CEC CPM no later than thirty (30) days prior to testing, and notification to the District and the CEC CPM at least ten (10) days prior to the actual date of testing shall be provided so that District or Energy Commision observers may be present. Changes to the test date made subsequent to the initial ten day notification may be communicated by telephone or other acceptable means no less than forty-eight (48) hours prior to the new test date.

GAS TURBINE CONDITIONS:

AQ-11 The heat input rate to each Gas Turbine shall not exceed 1,870 MMBtu/hr.

Verification: See AQ-37 and 38.

AQ-12 During cold start-up, the initial firing of the second Gas Turbine in each unit shall occur no sooner than 2 hours after the initial firing of the first Gas Turbine in that unit.

Verification: See AQ-37 and 38.

AQ-13 The pollutant mass emission rates in the exhaust discharged to the atmosphere from each Gas Turbine shall not exceed the following limits:

Pollutant	Lbs/Hour	Lbs/Day
Oxides of Nitrogen (NOx)	17.23	413.52
Carbon Monoxide (CO)	25.17	604.08
Particulate Matter <10 microns (PM10)	9.00	216.00
Volatile Organic Compounds (VOC)	4.79	114.96
Ammonia (NH3)	4.20	100.8
Sulfur Dioxide (SO2)	1.30	31.2

Protocol: These limits shall not apply during start-up, which is not to exceed four (4) hours. SCR catalytic controls and good engineering practices shall be used to the fullest extent practical during start-up to minimize pollutant emissions.

Verification: Verification: See AQ-37 and 38.

AQ-14 The pollutant concentrations discharged to the atmosphere from each Gas Turbine shall not exceed the following limits, calculated at 15 percent O2 on a one-hour rolling average unless otherwise noted:

Pollutant	Concentration (ppm)
Oxides of Nitrogen (as NO2)	2.5
Carbon Monoxide (CO)	6.0 (rolling three-hour average)
Ammonia (NH3)	5.0 (60-consecutive minute avg.)

Protocol: These limits shall not apply during start-up, which is not to exceed four (4) hours, or shutdown, which is not to exceed two (2) hours. SCR catalytic controls and good engineering practices shall be used to the fullest extent practical during start-up to minimize pollutant emissions.

Verification: See AQ-37 and 38.

AQ-15 The pollutant emission rates discharged to atmosphere from each Gas Turbine during a start-up or shutdown shall not exceed the following limits. These limits apply to any 60-minute period.

Pollutant	Start-Up (lbs/hr)	Shutdown (lbs/hr)
Oxides of Nitrogen (as NO2)	80.0	17.23
Carbon Monoxide (CO)	902.0	37.77

Volatile Organic Compounds (as CH4)	16.0	4.79

Verification: See AQ-37 and 38.

AQ-16 CEM Systems shall be installed and operated on each of the Gas Turbines. These systems shall be designed to continuously record the measured gaseous concentrations, and calculate and continuously monitor and record the CO, CO2 or O2, and NOx concentrations corrected to fifteen (15) percent oxygen (O2) on a dry basis.

The equipment installed for the continuous monitoring of CO shall be maintained and operated in accordance with 40 CFR Part 60 Appendix F, and the equipment installed for the continuous monitoring of CO2 or O2 and NOx shall be maintained and operated in accordance with 40 CFR Parts 72 and 75.

For periods of missing CO data, CO hourly values shall be substituted from valid hourly average data from the previous thirty (30) unit operating days, excluding periods of startup and shutdown. The CO data shall be substituted based on equivalent incremental load ranges.

Verification: See AQ-37 and 38.

AQ-17 Within sixty (60) days after the commissioning of the Gas Turbines, a Relative Accuracy Test Audit (RATA) must be performed on the CEMS in accordance with 40 CFR Part 60 Appendix B Performance Specifications, and the written test results of the performance tests shall be provided to the District within thirty (30) days after testing. A complete test protocol shall be submitted to the District no later than thirty (30) days prior to testing, and notification to the District at least ten (10) days prior to the actual date of testing shall be provided so that a District observer may be present. Changes to the test date made subsequent to the initial ten day notification may be communicated by telephone or other acceptable means no less than forty-eight (48) hours prior to the new test date.

The performance tests shall include those parameters specified in the approved test protocol, and shall at a minimum include the following:

a. Oxides of Nitrogen (as NO2): ppmv dry at 15% O2 and lbm/hr.
b. Carbon Monoxide: ppmv dry at 15% O2 and lbm/hr.
c. Volatile Organic Compounds (as CH4): ppmv dry at 15% O2 and lbm/hr.
d. Ammonia (NH3): ppmv dry at 15% O2 and lbm/hr

and the following process parameters:
e. Natural gas consumption.
f. Turbine load in megawatts.
g. Stack gas flow rate (SDCFM) calculated according to procedures in EPA method 19, and % CO2.

Verification: See AQ-40.

BOILER 6-1 AND 7-1 CONDITIONS:

AQ-18 The heat input rate to each Boiler shall not exceed 6,662.5 MMBtu/hr.

Verification: See AQ-37 and 38.

AQ-19 Effective December 31, 2000, the pollutant mass emission rates in the exhaust discharged to the atmosphere from one Boiler shall not exceed the following limits:

Pollutant	Lbs/Hour	Lbs/Day
Oxides of Nitrogen (NOx)	81.0	1,944
Carbon Monoxide (CO)	815.5	19,572
Particulate Matter <10 microns (PM10)	49.6	1,190.4
Volatile Organic Compounds (VOC)	35.9	861.6
Ammonia (NH3)	29.9	717.6
Sulfur Dioxide (SO2)	4.6	110.4

Protocol: These limits shall not apply during start-up, which is not to exceed four(4) hours. SCR catalytic controls and good engineering practices shall be used to the fullest extent practical during start-up to minimize pollutant emissions.

Verification: See AQ-37 and 38.

AQ-20 Effective December 31, 2000, the pollutant concentrations discharged to the atmosphere from one Boiler shall not exceed the following limits, based upon a one (1) hour rolling average (unless otherwise noted) calculated at 3 percent O2 on a dry basis:

Pollutant	Concentration (ppm
Oxides of Nitrogen (as NO2)	10
Carbon Monoxide (CO)	200 (rolling three hour avg.)
Ammonia (NH3)	10 (60-consecutive minute avg.)

Protocol: These limits shall not apply during start-up, which is not to exceed four (4) hours, or shutdown, which is not to exceed two (2) hours. SCR catalytic controls and good engineering practices shall be used to the fullest extent practical during start-up to minimize pollutant emissions.

Verification: See AQ-37 and 38.

AQ-21 During the period of December 31, 2000 through December 31, 2001, when both Units 6-1 and 7-1 are available, Duke Energy Moss Landing LLC shall preferentially operate the unit subject to the emission limits contained in Condition 20, such that its MW-hours equal or exceed the MW-hours of the

unit not subject to the requirements of Condition 20; provided that such preferential operation shall not impair the provision of reliable electric service.

Verification: See AQ-37 and 38.

AQ-22 Effective December 31, 2001, the pollutant mass emission rates in the exhaust discharged to the atmosphere from each Boiler shall not exceed the following limits:

Pollutant	**Lbs/Hour**	**Lbs/Day**
Oxides of Nitrogen (NOx)	81.0	1,944
Carbon Monoxide (CO)	815.5	19,572
Particulate Matter <10 microns (PM10)	49.6	1,190.4
Volatile Organic Compounds (VOC)	35.9	861.6
Ammonia (NH3)	29.9	717.6
Sulfur Dioxide (SO2)	4.6	110.4

Protocol: These limits shall not apply during start-up, which is not to exceed four(4) hours. SCR catalytic controls and good engineering practices shall be used to the fullest extent practical during start-up to minimize pollutant emissions.

Verification: See AQ-37 and 38.

AQ-23 Effective December 31, 2001, the pollutant concentrations discharged to the atmosphere from each Boiler shall not exceed the following limits, based upon a one (1) hour rolling average (unless otherwise noted) calculated at 3 percent O2 on a dry basis:

Pollutant	Concentration (ppm)
Oxides of Nitrogen (as NO2)	10
Carbon Monoxide (CO)	200 (rolling three hour avg.)
Ammonia (NH3)	10 (60-consecutive minute avg.

Protocol: These limits shall not apply during start-up, which is not to exceed four (4) hours, or shutdown, which is not to exceed two (2) hours. SCR catalytic controls and good engineering practices shall be used to the fullest extent practical during start-up to minimize pollutant emissions.

Verification: Verification: See AQ-37 and 38.

AQ-24 CEM Systems shall be installed and operated on each of the Boilers. These systems shall be designed to continuously record the measured gaseous concentrations, and calculate and continuously monitor and record the CO, CO2 or O2, and NOx concentrations corrected to three (3) percent oxygen (O2) on a dry basis.

The equipment installed for the continuous monitoring of CO shall be maintained and operated in accordance with 40 CFR Part 60 Appendix F, and the equipment installed for the continuous monitoring of CO2 or O2 and NOx shall be maintained and operated in accordance with 40 CFR Parts 72 and 75.

For periods of missing CO data, CO hourly values shall be substituted from valid hourly average data from the previous thirty (30) unit operating days, excluding periods of startup and shutdown. The CO data shall be substituted based on equivalent incremental load ranges.

Verification: See AQ-37 and 38.

GENERAL CONDITIONS:

AQ-25 Cumulative emissions, including emissions generated during Start-ups and Shutdowns, from all power generation equipment at the Moss Landing Power Plant shall not exceed the following quarterly limits:

Pollutant	Pounds Of Emissions Per Calendar Quarter			
	First	Second	Third	Fourth
NOx (as NO2)	449,601	452,709	527,313	527,313
Sox	26,969	27,147	31,427	31,427
VOC	168,874	170,254	203,361	203,361
PM10	247,163	249,070	294,820	294,820
CO	3,380,493	3,411,808	4,163,364	4,163,364

Note: These quarterly emission limits are only valid upon submittal of a final offset package identical to the offset package proposed in the application.

Verification: See AQ-37 and 38.

AQ-26 This equipment shall be fired exclusively on natural gas with a maximum sulfur content of 0.25 grains per 100 dry standard cubic feet.

Verification: See AQ-37 and 38.

AQ-27 This equipment shall be abated by a properly operated and maintained Selective Catalytic Reduction System.

Verification: See AQ-37 and 38.

AQ-28 Duke Energy Moss Landing LLC shall demonstrate compliance by using properly operated and maintained continuous emission monitors (during all hours of operation including equipment Start-up and Shutdown periods) for all of the following parameters:

a. Firing hours and Fuel Flow Rates.
b. Oxygen (O2) Concentrations, Nitrogen Oxide (NOx) Concentrations, and Carbon Monoxide (CO) Concentrations.

c. Ammonia Injection Rates.

Duke Energy Moss Landing LLC shall record all of the above parameters every 15 minutes (excluding normal calibration periods) and shall summarize all of the above parameters for each clock hour. For each calendar day, Duke Energy Moss Landing LLC shall calculate and record the total Firing Hours, the average hourly Fuel Flow Rates, and pollutant emission concentrations.

Duke Energy Moss Landing LLC shall use the parameters measured above and District-approved calculation methods to calculate the following parameters:

d. Heat Input Rate.
e. Corrected NOx concentrations, NOx mass emissions (as NO2), corrected CO concentrations, and CO mass emissions.

For each source, Duke Energy Moss Landing LLC shall record the parameters specified in d. and e. of this Condition every 15 minutes (excluding normal calibration periods). As specified below, Duke Energy Moss Landing LLC shall calculate and record the following data:

f. Total Heat Input Rate for every clock hour.
g. The NOx mass emissions (as NO2), and corrected NOx emission concentrations for every rolling one-hour period (clock hour averages for Boilers 6-1 and 7-1).
h. The CO mass emissions, and corrected CO emission concentrations for every rolling three-hour period.
i. On an hourly basis, the cumulative total NOx mass emission (as NO2) and the cumulative total CO mass emissions.
j. For each calendar day, the cumulative total NOx mass emission (as NO2) and the cumulative total CO mass emissions.
k. For each calendar quarter, the cumulative total NOx mass emission (as NO2) and the cumulative total CO mass emissions.
l. For each calendar year, the cumulative total NOx mass emission (as NO2) and the cumulative total CO mass emissions.

Verification: See AQ-37 and 38.

AQ-29 Duke Energy Moss Landing LLC shall calculate and record on a daily basis, the Volatile Organic Compound (VOC) mass emissions, Fine Particulate Matter (PM10) mass emissions, Sulfur Dioxide (SO2) mass emissions, and Ammonia (NH3) mass emissions from each source. Duke Energy Moss Landing LLC shall use the actual heat input rates, actual Start-up times, actual Shutdown times, and District-approved emission factors to calculate these emissions. The calculated emissions shall be presented as follows:

a. For each calendar day, VOC, PM10, SO2, and NH3 mass emissions shall be summarized for each source.
b. On a daily basis, the cumulative total VOC, PM10, SO2 and NH3 mass emissions shall be summarized for each calendar quarter and for the calendar year.

Verification: See AQ-37 and 38.

AQ-30 A continuous monitoring system must be operated to monitor and record the mole ratio of injected ammonia to exhaust stack NOx. This system must be accurate to within – 5 percent.

Verification: See AQ-37 and 38.

AQ-31 Instrumentation must be operated to measure the SCR catalyst inlet temperature and pressure differential across the SCR catalyst.

Verification: AQ-37 and 38.

AQ-32 Duke Energy Moss Landing LLC shall submit to the Air Pollution Control District a written report each month which shall include:

a. time intervals, date, and magnitude of excess emissions;
b. nature and cause of the excess emission, and corrective actions taken;
c. time and date of each period during which the continuous monitoring system was inoperative, except for zero and span checks, and the nature of system repairs and adjustments; and
d. a negative declaration when no excess emissions occurred.

Verification: See AQ-37 and 38.

AQ-33 Duke Energy Moss Landing LLC shall monitor and report SO2 emissions in accordance with 40 CFR Parts 72 and 75.

Verification: See AQ-37 and 38.

AQ-34 Starting January 1, 2000, Duke Energy Moss Landing LLC shall hold Sulfur Dioxide Allowances in the compliance subaccounts not less than the total annual emissions of sulfur dioxide for the previous calendar year.

Verification: See AQ-37 and 38.

AQ-35 The equipment installed for the continuous monitoring of CO2 or O2 and NOx shall be maintained and operated in accordance with 40 CFR Parts 72 and 75.

Verification: See AQ-37 and 38.

AQ-36 A written Quality Assurance program must be established in accordance with 40 CFR Part 75, Appendix B and 40 CFR Part 60, Appendix F which includes, but is not limited to: procedures for daily calibration testing, quarterly linearity and leak testing, record keeping and reporting implementation, and relative accuracy testing.

Verification: See AQ-37 and 38.

AQ-37 Pursuant to Title IV, Part 75, Section 75.50, and Rule 431, Section 4.3, permanent records shall be maintained for a period of five years after creation. The records at a minimum shall include all items specified in Section 75.50 and in Rule 431.

Verification: The records shall be maintained for a period of five years after creation and be available for inspection by representatives of the District, Air Resources Board, the CEC CPM and other appropriate agencies.

AQ-38 Pursuant to Title IV, Part 75, Section 75.64, quarterly reports shall be submitted to the District within 30 days following the end of the calendar quarter. The reports must be in electronic format and at a minimum must include all items listed in Section 75.64.

Verification: Copies of the quarterly reports shall be submitted to the District and the CEC CPM within 30 days following the end of the calendar quarter. At a minimum, the quarterly report must include all items listed in Section 75.64.

AQ-39 Duke Energy Moss Landing LLC shall cause monthly testing to be performed to verify compliance with the Ammonia (NH3) slip limit. Duke Energy Moss Landing LLC shall conduct this testing in accordance with the collection method specified in BAAQMD Source Test Procedure ST-1B and the analysis specified in EPA method 350.3.

Verification: See AQ-37 and 38.

AQ-40 Annual performance tests shall be conducted in accordance with the Monterey Bay Unified Air Pollution Control District test procedures during the last quarter of each year, and the written results of the performance tests shall be provided to the District within thirty (30) days after testing. A testing protocol shall be submitted to the District no later than thirty (30) days prior to the testing, and notification to the District at least ten (10) days prior to the actual date of testing shall be provided so that a District observer may be present. Changes to the test date made subsequent to the initial ten day notification may be communicated by telephone or other acceptable means no less than forty-eight (48) hours prior to the new test date.

If the testing cannot be completed during the last quarter of the year due to the equipment being nonoperational or due to the power generation requirements of the grid being such that a unit would be unable to operate at greater than 50% load, the testing can be delayed, such that the testing be completed during the first quarter of the following year provided that Duke Energy Moss Landing LLC notify the District that they will be unable to meet the last quarter testing requirement as soon as it becomes known, but in no event later than December 15.

Verification: The written results of the performance tests shall be provided to the District within thirty (30) days after testing. A testing protocol shall be submitted to the District no later than thirty (30) days prior to the testing, and notification to the District at least ten (10) days prior to the actual date of testing shall be provided so that a District or CEC observer be present. Changes to the test date made

subsequent to the initial ten day notification may be communicated by telephone or other acceptable means no less than forty-eight (48) hours prior to the new test date.

AQ-41 Duke Energy Moss Landing LLC shall report all breakdowns which results in the inability to comply with any emission standard or requirement contained on this permit to the Air Pollution Control Officer (APCO) within 1 hour of the occurrence, this one hour period may be extended up to six hours for good cause by the APCO. The APCO may elect to take no enforcement action if Duke Energy Moss Landing LLC demonstrates to the APCO s satisfaction that a breakdown condition exists.

The estimated time for repair of the breakdown shall be supplied to the APCO within 24 hours of the occurrence and a written report shall be supplied to the APCO with 5 days after the occurrence has been corrected. This report shall include at a minimum:

a. a statement that the condition or failure has been corrected and the date of correction; and
b. a description of the reasons for the occurrence; and
c. a description of the corrective measures undertaken and/or to be undertaken to avoid such an occurrence in the future; and
d. an estimate of the emissions caused by the condition or failure.

Verification: See AQ-37 and 38.

AQ-42 Duke Energy Moss Landing LLC shall provide adequate stack sampling ports and platforms to enable the performance of source testing. The location and configuration of the stack sampling ports shall be subject to District review and approval.

Verification: The project owner shall submit design drawings of the location and configuration of the stack sampling ports to District and CEC CPM review and approval at least 60 prior to the start of construction of the HRSG and stack.

AQ-43 No emissions shall constitute a public nuisance.

Verification: See AQ-37 and 38.

AQ-44 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three (3) minutes in any one (1) hour which is as dark or darker than Ringelmann 1 or equivalent 20% opacity.

Verification: See AQ-37 and 38.

AQ-45 Any representative of the Monterey Bay Unified Air Pollution Control District authorized by the Air Pollution Control Officer shall be permitted, pursuant to the authority contained in Section 41510 of the California Health and Safety Code:

a. to enter upon the premises where the source is located or in which any records are required to be kept under the terms and conditions of the Authority to Construct;
b. to have access to and copy any records required to be kept under the terms and conditions of this Authority to Construct;
c. to inspect any equipment, operation, or process described or required in this Authority to Construct; and,
d. to sample emissions from the source.

Verification: Representatives of the District, CEC CPM, the Air Resources Board, or other appropriate agencies shall have the authority to enter the premises to witness source tests, review and copy records, inspect equipment and sample emissions for the sources.

CONDITIONS OF CERTIFICATION numbers AQ-46 through AQ-49 are reserved for future use.

ENGERY COMMISSION STAFF CONDITIONS

CONDITIONS OF CERTIFICATION — CONSTRUCTION

These conditions are not included in the District s Determination of Compliance.

For the purposes of these conditions, the following definitions apply:

(1) ACTIVE OPERATIONS shall mean any activity capable of generating fugitive dust, including, but not limited to, earth-moving activities, construction/demolition activities, or heavy- and light-duty vehicular movement.

(2) CHEMICAL STABILIZERS mean any non-toxic chemical dust suppressant which must not be used if prohibited for use by the Regional Water Quality Control Boards, the California Air Resources Board, the U.S. Environmental Protection Agency (U.S. EPA), or any applicable law, rule or regulation; and should meet any specifications, criteria, or tests required by any federal, state, or local water agency. Unless otherwise indicated, the use of a non-toxic chemical stabilizer shall be of sufficient concentration and application frequency to maintain a stabilized surface.

(3) CONSTRUCTION/DEMOLITION ACTIVITIES are any on-site mechanical activities preparatory to or related to the building, alteration, rehabilitation, demolition or improvement of property, including, but not limited to the following activities; grading, excavation, loading, crushing, cutting, planing, shaping or ground breaking.

(4) DISTURBED SURFACE AREA means a portion of the earth s surface which has been physically moved, uncovered, destabilized, or otherwise modified from its undisturbed natural soil condition, thereby increasing the potential for emission of fugitive dust.

(5) DUST SUPPRESSANTS are water, hygroscopic materials, or non-toxic chemical stabilizers used as a treatment material to reduce fugitive dust emissions.

(6) EARTH-MOVING ACTIVITIES shall include, but not be limited to, grading, earth cutting and filling operations, loading or unloading of dirt or bulk materials, adding to or removing from open storage piles of bulk materials, landfill operations, or soil mulching.

(7) FUGITIVE DUST means any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of man.

(8) INACTIVE DISTURBED SURFACE AREA means any disturbed surface area upon which active operations have not occurred or are not expected to occur for a period of ten consecutive days.

(9) STABILIZED SURFACE means:
(A) any disturbed surface area or open storage pile which is resistant to wind-driven fugitive dust;
(B) any unpaved road surface in which any fugitive dust plume emanating from vehicular traffic does not exceed 20 percent opacity.

(10) VISIBLE ROADWAY DUST means any sand, soil, dirt, or other solid particulate matter which is visible upon paved road surfaces and which can be removed by a vacuum sweeper or a broom sweeper under normal operating conditions.

AQ-50 The project owner shall implement a CEC CPM approved fugitive Dust Control Plan.

Protocol: The plan shall include the following:

1. A description of each of the active operation(s) which may result in the generation of fugitive dust;
2. An identification of all sources of fugitive dust (e.g., earth-moving, storage piles, vehicular traffic, etc.
3. A description of the control measures to be applied to each of the sources of dust emissions identified above (including those required in AQ-47 below). The description must be sufficiently detailed to demonstrate that the applicable best available control measure(s) will be utilized and/or installed during all periods of active operations;
4. In the event that there are special technical (e.g., non-economic) circumstances, including safety, which prevent the use of at least one of the required control measures for any of the sources identified, a justification statement must be provided to explain the reason(s) why the required control measures cannot be implemented.

Verification: Not later than sixty (60) days prior to the commencement of construction, the project owner shall submit the plan to the CEC CPM for review and approval. The project owner shall maintain daily records to document the

specific actions taken pursuant to the plan. A summary of the monthly activities shall be submitted to the CPM via the Monthly Compliance Report.

AQ-51 During the construction phase of the project, the project owner shall:

1. Prevent or remove within one hour the track-out of bulk material onto public paved roadways as a result of their operations, or take at least one of the actions listed in Table 2 (attached) to prevent the track-out of bulk material onto public paved roadways as a result of their operations and remove such material at anytime track-out extends for a cumulative distance of greater than 50 feet on to any paved public road during active operations;
2. Install and use a track-out control device to prevent the track-out of bulk material from areas containing soils requiring corrective to other areas within the project construction site and laydown area;
3. Minimize fugitive particulate emissions from vehicular traffic on paved roads and paved parking lots on the construction site by vacuum mechanical sweeping or water flushing of the road surface to remove buildup of loose material. The project owner shall inspect on a daily basis the conditions of the paved roads and parking lots to determine the need for mechanical sweeping or water flushing.

Verification: The project owner shall maintain a daily log during the construction phase of the project indicating: 1) the manner in which compliance with this condition is achieved and 2) the date and time when the inspection of paved roads and parking lots occurs and the date and time(s) when the cleaning operation occurs. The logs shall be made available to the California Energy Commission CPM upon request.

AQ-52 At any time when fugitive dust from MLPP project construction is visible in the atmosphere beyond the property line, the project owner will identify the source of the fugitive dust and implement one or more of the appropriate control measures specified in Table 3 (attached)

Verification: The project owner will maintain a daily log recording the dates and times that measures in Table 3 (attached) have been implemented and make them available to the California Energy Commission CPM upon request.

AQ-53 The project owner shall implement an approved Construction Equipment Plan. The Plan shall identify how the project owner will ensure that all heavy equipment, that includes, but is not limited to, bulldozers, backhoes, compactors, loaders, motor graders and trenchers, and cranes, dump trucks and other heavy duty construction related trucks, used on-site by construction contractors and subcontractors:

a. are properly maintained;
b. use 50 ppm or less sulfur diesel fuel; and
c. meet federal emission standards for construction equipment.

Verification: Not later than sixty (60) days prior to the commencement of construction, the project owner shall submit the plan to the California Energy

Commission CPM for review and approval. The project owner shall maintain records to document the specific actions taken pursuant to the plan. A summary of the monthly activities shall be submitted to the California Energy Commission CPM via the Monthly Compliance Report.

TABLE 1
BEST AVAILABLE FUGITIVE DUST CONTROL MEASURES

FUGITIVE DUST SOURCE CATEGORY	CONTROL ACTIONS
Earth-moving (except construction cutting and filling areas, and mining operations)	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the CEC CPM. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; OR
	For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
Earth-moving: Construction fill areas:	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the CEC CPM. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the CEC CPM, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.
Earth-moving: Construction cut areas and mining operations:	Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Disturbed surface areas (except completed grading areas)	Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind driven fugitive dust must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
Disturbed surface areas: Completed grading areas	Apply chemical stabilizers within five working days of grading completion; OR
	Take actions (3a) or (3c) specified for inactive disturbed surface areas.
Inactive disturbed surface areas	Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; OR
	Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR
	Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR
	Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas.

FUGITIVE DUST SOURCE CATEGORY	CONTROL ACTIONS
Unpaved Roads	Water all roads used for any vehicular traffic at least once per every two hours of active operations; OR
	Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; OR
	Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
Open storage piles	Apply chemical stabilizers; OR
	Apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; OR
	Install temporary coverings; OR
	Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile.
ALL CATEGORIES	Any other control measures approved by the CEC CPM as equivalent to the methods specified in Table 1 may be used.

TABLE 2

TRACK-OUT CONTROL OPTIONS

(1)	Pave or apply chemical stabilization at sufficient concentration and frequency to maintain a stabilized surface starting from the point of intersection with the public paved surface, and extending for a centerline distance of at least 100 feet and a width of at least 20 feet.
(2)	Pave from the point of intersection with the public paved road surface, and extending for a centerline distance of at least 25 feet and a width of at least 20 feet, and install a track-out control device immediately adjacent to the paved surface such that exiting vehicles do not travel on any unpaved road surface after passing through the track-out control device.
(3)	Any other control measures approved by the CEC CPM as equivalent to the methods specified in Table 2 may be used.

TABLE 3

CONTROL MEASURES FOR WIND CONDITIONS EXCEEDING 25 MPH

FUGITIVE DUST SOURCE CATEGORY	CONTROL MEASURES
Earth-moving	Cease all active operations; OR
	Apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed surface areas	On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR
	Apply chemical stabilizers prior to wind event; OR
	Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; OR
	Take the actions specified in Table 1, Item (3c); OR

FUGITIVE DUST SOURCE CATEGORY	CONTROL MEASURES
	Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.
Unpaved roads	Apply chemical stabilizers prior to wind event; OR
	Apply water twice [once] per hour during active operation; OR
	Stop all vehicular traffic.
Open storage piles	Apply water twice [once] per hour; OR
	Install temporary coverings.
Paved road track-out	Cover all haul vehicles; OR
	Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
All Categories	Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 3 may be used.

REFERENCES

ARB 1988. Air Resources Board, Stationary Source Division, Proposed Adoption of Regulations Limiting the Sulfur Content and Aromatic Hydrocarbon Content of Motor Vehicle Diesel Fuel, October 1988.

ARB 1992. California Air Resources Board, Sources and Control of Nitrogen Emissions , Sacramento, August. p. 38

ARB, 1992-1997. California Air Quality Data, Annual and Quarterly Summaries, Aerometric Division, Sacramento.

ARB 1996. Air Resources Board. Second Triennial Review of the Assessment of the Impacts of Transported Pollutants on Ozone Concentrations in California , October 1996.

ARB 1998 Air Resource Board. Proposed Amendments to the Designation Criteria and Amendments to the Area Designations for State Ambient Air Quality Standards , August 1998.

Clean 2000. Clean Diesel Technologies, Test Results Confirm that a Platinum/Cerium Diesel Fuel Combustion Catalyst Equals or Exceeds Low Sulfur Diesel Fuel in Reduction Particulate Emissions from a Heavy Duty Diesel Engine, News Bulletin, January 10, 2000.

District 1999a. 1998 Report on Attainment of the California Particulate Matter Standards in the Monterey Bay Region, Monterey Bay Unified Air Pollution Control District, January 1999.

District 1999b. Letter from Mr. Mike Sewell, Monterey Bay Unified Air Pollution Control District to Mr. Paul Richins, CEC, July 7, 1999.

District 2000a. Preliminary Determination of Compliance, Application Numbers 9837-9840, Monterey Bay Unified Air Pollution Control District, January 7, 2000.

District 2000b. Personal conversation with Mr. Mike Sewell of the Monterey Bay Unified Air Pollution Control District, January 21, 2000.

EPRI 1990. Combustion Turbine NOx Control News. Electric Power Research Institute. RP 2936, Summer 1990, Issue 3.

Moss 1996. Moss Landing Air Monitoring Program Final Report, The Moss Landing Air Monitoring Program Advisory Committee, May 1996.

MLPP 1999a. Application for Certification, Moss Landing Power Plant (99-AFC-4), May 7, 1999.

MLPP 1999b. Moss Landing Power Plant Project (99-AFC-4) Data Adequacy Responses 1999.

MLPP 1999c. Moss Landing Power Plant Project (99-AFC-4) Supplementary AFC Filing, November 22, 1999.

MLPP 2000. Moss Landing Power Plant Project (99-AFC-4) Letter to Ms. Janet Brennan, January 5, 2000.

PUBLIC HEALTH

Obed Odoemelam

INTRODUCTION

Operating the Moss Landing Power Plant (MLPPP) as proposed by Duke Energy (the applicant), 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 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. The impacts of the proposed project s criteria pollutants are discussed in the **Air Quality** section.

LAWS ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

The Clean Air Act of 1970 (42 U.S.C., section 7401 et seq.) required establishment of ambient air quality standards to protect the public from the effects of air pollutants. These standards have been established by the United States Environmental Protection Agency (EPA) for the major air pollutants: nitrogen dioxide, ozone, sulfur dioxide, carbon monoxide, sulfates, particulate matter with a diameter of 10 micron or less (PM10) and lead. The Act required states to adopt plans to ensure compliance by 1982.

STATE

California Health and Safety Code section 39606 requires the California Air Resources Board (CARB) to establish California s ambient air quality standards to reflect the California-specific conditions that influence its air quality. Such standards have been established by the CARB for ozone, carbon monoxide, sulfur dioxide, PM10, lead, hydrogen sulfide, vinyl chloride and nitrogen dioxide. The same biological mechanisms underlie some of the health effects of most of these criteria pollutants as well as the noncriteria pollutants. 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 CARB 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 likely 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 CARB and the air quality management districts are responsible for ensuring implementation of these requirements for new emission sources.

LOCAL

The Monterey Bay Unified Air Pollution Control District (MBUAPCD) has no specific rules implementing Health and Safety Code section 44300. However, it does require the results of a health risk assessment as part of the application for an Authority to Construct (ATC). MLPPP has complied with this requirement.

MBUAPCD Rule 1000 (Permit Guidelines and Requirements for Sources Emitting Toxic Air Contaminants, TACs),requires the application of best available control technology to a new or modified source emitting TACs. It further requires that the excess cancer risk from the project s carcinogenic emissions, as demonstrated through a risk assessment, not exceed 10 in one million and that the maximum increase in ambient 1-hour TAC concentrations of noncarcinogenic toxic emissions not exceed 1/420 th of the applicable permissible exposure limits (PELs). For a source of noncarcinogenic TACs, reasonable, available control

technology must be applied. Furthermore, the maximum increase in ambient 1-hour TAC concentrations must not exceed 1/420 th of applicable PELs

SETTING

According to information from the applicant, (MLPPP 1999 pages 1-5,and 6.16-2), the proposed project will be located within the existing MLPPP in an area that includes industrial facilities, agricultural land, sparsely populated zones, recreational beaches and tidal wetlands. The project site is located in the vicinity of Moss Landing Harbor, which has a small, dispersed population of approximately 200. The nearest residence is located approximately 1,700 feet to the north. The applicant has provided a listing of facilities with sensitive receptors (such as children, the elderly, and the chronically ill) within the potential impact area (MLPPP 1999 page 6.16-13). These sensitive receptors are usually more susceptible than the general population to the effects of environmental pollutants. Extra consideration is given to possible effects on these individuals in establishing exposure limits for environmental pollutants. The nearest of these facilities is a school, 2.3 miles to the north.

METHOD OF ANALYSIS

Any impacts from this type of project would be mainly associated with the toxic pollutants originating from the combustion of natural gas in turbines, ammonia from the selective catalytic reduction (SCR) system, and toxic chemicals from the cooling towers. Potential public exposure to the surrounding population is estimated through air dispersion modeling as described in the **Air Quality** section. After estimating the exposure levels, staff assesses whether these exposure estimates are below the applicable reference exposure levels used for evaluating effects, or below levels at which any possible cancer risks are considered significant by regulatory agencies in the case of cancer-causing (or carcinogenic) pollutants. 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 the potential health effects of each pollutant of concern are identified;

- A dose-response assessment step in which the relationship 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 for individual pollutants and for all toxic pollutants combined.

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 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 already are major sources in the area. Such pollutants are generally emitted at relatively low levels as compared to criteria pollutants. Environmental acceptability may also be assessed on a case-specific basis, in terms of relative contribution of project-related emissions to pollutant levels in the area.

For facilities such as the proposed MLPPP, that burn natural gas, high-level exposure to toxic pollutants (which could cause acute effects), could occur only during major accidents. Such exposures are not expected from routine operations, when emissions are much lower. Therefore, long-term, chronic exposures are of greater concern than such potential short-term effects in assessing possible public health impacts. Chronic effects may be related to cancer or health effects other than cancer.

The method used by regulatory agencies to assess the significance of noncancer health effects 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 pollutants by dividing the project-related exposure (estimated from dispersion modeling), by the reference level for that pollutant. This reference level is the exposure level below which impacts would not be expected. 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 suggest a likelihood of effects but does not demonstrate that such effects will 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 would suggest a lack of significant potential for effects from all pollutant exposures considered together. A value of more than 1.0 would suggest a significant potential for effects but does not demonstrate that such effects will occur. In such a case, any recommended regulatory actions would be based on further more refined analysis.

Potential Cancer Risk

Cancer caused by exposure to carcinogenic compounds 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 high level of significance presently placed on 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. This potency value is established from available studies as an indicator of the relative ability of the carcinogen to cause cancer. 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

The Energy Commission staff considers a potential cancer risk of one in a million as representing a threshold below which carcinogenic exposures would be insignificant. Above this threshold, 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 and may recommend mitigation after a more refined analysis.

IMPACTS

PROJECT SPECIFIC IMPACTS

Construction Phase Impacts

Potential risks to public health during construction may be associated with toxic substances at the site that are disturbed during site preparation, and emissions from heavy construction equipment (MLPPP 1999 Appendix 6.2-5). 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 MBUAPCD rules together with the requisite conditions of certification.

Specific locations at the project site have been shown from site assessment surveys to be contaminated by specific contaminants from past industrial activities at the site (MLPPP 1999 pages 6.14-1 through 6.14-4). As noted by the applicant (MLPPP 1999 pages 6.14-1 through 6.14-4) and discussed in the **Waste Management** section, these contaminated locations will be remediated before construction, according to existing state requirements. Therefore, staff does not anticipate any pollutant-related public health impacts from the relatively short-term construction-related earth moving activities at the site. Effects from chronic exposures are usually not expected from these short-term activities.

Direct Operational Impacts

The applicant conducted a 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 (MLPPP 1999 pages 6.2-23, 6.2-41,through 6.2-40, pages 6.2-58 through 6.2-60, pages 6.16-3 through 6.16-10, and Appendix 6.2-4). Such documentation was provided with regard to the following:

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

Staff has found these assumptions to be generally accurate and concurs with the applicant s findings regarding 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 pollutants were considered for their 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). 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 0.05 was calculated for combined chronic health effects for the individual at the maximum impact location approximately 3.6 miles to the east of the project site. A value of 0.03 was calculated for combined acute health effects for an individual at the maximum impact location approximately 4.4 miles east-northeast of the site. These values are much below the 1.0 significance level suggesting that significant noncancer health effects would be unlikely during operations. These maximum impact levels are also below their significance thresholds as established under Rule 1000 of MBUAPCD.

The highest combined cancer risk was estimated to be 0.03 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 the one in

a million level considered significant by staff regarding public exposure to environmental carcinogens.

CUMULATIVE IMPACTS

When toxic pollutants are emitted from multiple sources within a given area, the cumulative, or additive, impacts of such emissions could, in concept, lead to significant health impacts within the population, even when such pollutants are emitted at insignificant levels from the individual sources involved. Analyses of such emissions have shown, however, that the peak impacts of such toxic pollutants are normally localized within relatively short distances from the source. Toxic pollutant 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 major sources of such pollutants are presently proposed for the immediate vicinity of MLPPP, no cumulatively significant exposures are expected by staff for the project area.

PROJECT CLOSURE

As noted in the introduction to this section, this analysis is limited to the routine, project-related release of harmful substances into the environment. During either temporary of permanent facility closure, the major concern would be from accidental or nonroutine releases of either hazardous materials or wastes, which may be stored on site. These are discussed in the sections on **Hazardous Materials Management** and **Waste Management**, respectively. During temporary closures (of greater duration than associated with normal maintenance operations) routine release of hazardous materials would be unlikely since the project would not be operating. For permanent closure, the only routine emissions would be related to facility demolition or dismantling, such as exhaust from heavy equipment or fugitive dust emissions. These would be subject to conditions promulgated by the Energy Commission s Air Quality staff once a closure plan is received from the project owner.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff has determined that the construction, operation and closure 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.

RECOMMENDATIONS

Since no significant public health impacts are considered likely by staff, no Public Health Conditions of Certification are proposed for the project.

REFERENCES

California Air Resources Board (CARB) 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.

Moss Landing Power Project (MLPPP) 1999. Application for Certification (99-AFC-2). Submitted to the California Energy Commission, May 7, 1999.

WORKER SAFETY AND FIRE PROTECTION

Kathi Hann

INTRODUCTION

Worker safety and fire protection is legislated by laws, ordinances, regulations, and standards (LORS), and enforced through regulations codified at the Federal, State, and local levels. Worker safety is of utmost priority at the project location and is documented through worker safety practices and training. Employees at industrial facilities operate process equipment, handle hazardous materials and work in hazardous environments that subject them potentially to accidents and serious injury. Protection measures are usually employed in industrial work places to either eliminate these hazards or minimize the risks of accidents or injury through special training, protective equipment, and administrative or procedural controls.

The purpose of this analysis is to identify the potential impacts of project construction and operation on workers, including fire hazards, and to assess the adequacy of worker safety and fire protection measures proposed by Duke Energy Moss Landing LLC for the Moss Landing Power Plant Project (MLPPP). Although not included in the AFC for Moss Landing, activities associated with the demolition of existing, unused, fuel oil storage tanks and the Selective Catalytic Reduction (SCR) System Installation are included in this analysis. These activities are also reviewed and permitted by the Monterey County Planning Department, consistent with the North County Land Use Plan Policy 5.2.2.

Staff has reviewed both the original Application for Certification (May, 1999) and the November 22, 1999 AFC Supplementary Filing (Change in Project Description; Air Quality Increments & Cumulative Impacts Analysis; and Response to Additional California Coastal Commission Follow Up Questions) to determine whether MLPPP has proposed adequate measures to:

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

Staff has determined that the features of the proposed project, in association with the proposed worker safety plans and procedures, will, for the most part, comply with applicable LORS and minimize the exposure of workers to industrial accidents or hazards. However, issues relating to the adequacy of the local fire district s fire protection service capabilities, and appropriate mitigation for any deficiencies identified, have not yet been resolved. They will be addressed further in the Final Staff Assessment.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

In December 1970 Congress enacted Public Law 91-596, the Federal Occupational Safety and Health Act of 1970 (the Act). The Act mandates safety requirements in the workplace and is found in Title 29 of the United States Code,/651 (29 U.S.C. //651 through 678). This public law is codified at Title 29 of the Code of Federal Regulations, under General Industry Standards, Parts 1910.1 through 1910.1450 (29 CFR Part 1910.1 - 1910.1450) and clearly defines the procedures for promulgating regulations and conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector. Most of the safety and health standards now in force under the Act for general industry represent a compilation of materials authorized by the Act from existing federal standards and national consensus standards. These include standards of the voluntary membership organizations of the American National Standards Institute (ANSI), and the National Fire Protection Association (NFPA) which publishes the National Fire Codes.

The congressional purpose of the Act is to assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources, (29 USC/651). The Federal Department of Labor promulgates and enforces safety and health standards that are applicable to all businesses affecting interstate commerce. The Department of Labor established the Occupational Safety and Health Administration (OSHA) in 1971 to discharge the responsibilities assigned by the Act.

Applicable Federal requirements include:

- 29 U.S. Code/651 et seq. (Occupational Safety and Health Act of 1970)
- 29 CFR Part 1910.1 - 1910.1450 (Occupational Safety and Health
- Administration Safety and Health Regulations)
- 29 CFR Part 1952.170 — 1952.175 (Federal approval of California s plan for enforcement of its own Safety and Health requirements, in lieu of most of the Federal requirements found in 29 CFR Part 1910.1 — 1910.1500)

STATE

California passed the Occupational Safety and Health Act of 1973 (Cal/OSHA) as published in the California Labor Code/6300. Regulations promulgated as a result of the Act are codified at Title 8 of the California Code of Regulations, beginning with Part 450 (8 CCR Part 450 et seq.) The California Labor Code requires that the State Standards Board must adopt standards at least as effective as the federal standards that have been promulgated (Calif. Labor Code/142.3(a)). State Health and Safety laws meet or exceed the Federal requirements. Hence, California obtained federal approval of its State health and safety regulations, in lieu of the federal requirements published at 29 CFR Parts 1910.1 - 1910.1500. The Federal

Secretary of Labor, however, continually oversees California s program and will enforce any federal standard for which the State has not adopted a Cal/OSHA counterpart.

The State of California Department of Industrial Relations is charged with responsibility for administering the Cal/OSHA plan. The Department of Industrial Relations is further split into six divisions to oversee, among other activities: industrial accidents, occupational safety and health, labor standards enforcement, statistics and research, and the State Compensation Insurance Fund (workers compensation).

Employers are responsible to insure that their employees are informed about workplace hazards, potential exposure and the work environment (Calif. Labor Code/6408). Cal/ OSHA s principal tool in ensuring that workers and the public are informed is the Material Safety Data Sheet (MSDS) (8 CCR/5194). This regulation was promulgated in response to California s Hazardous Substances Information and Training Act of 1990 (1980 Calif./874 and Calif. Labor Code// 6360-6399.7). It mirrored the Federal Hazard Communication Standard (29 CFR Part 1910.1200) which established an employee s right to know about chemical hazards in the workplace, but added the provision of applicability to public sector employers.

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

Applicable State requirements include:

- 8 CCR/339 - List of hazardous chemicals relating to the Hazardous Substance Information and Training Act
- 8 CCR/450, et seq. Cal / OSHA regulations
- 24 CCR/3, et seq. - incorporates the current edition of the Uniform Building Code
- Health and Safety Code/25500, et seq. - Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at the facility
- Health and Safety Code/25500 - 25541 - Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at the facility

LOCAL

The California Building Standards, published at Title 24 of the California Code of Regulations (24 CCR/3 , et seq.), is comprised of eleven parts containing the building design and construction requirements relating to fire and life safety and

structural safety. The Building Standards include the electrical, mechanical, energy, and fire codes applicable to the project. Local planning /building & safety departments enforce the California Building Code.

National Fire Protection Association (NFPA) standards are published in the California Fire Code. The fire code contains general provisions for fire safety, including but not restricted to: 1) required road and building access; 2) water supplies; 3) installation of fire protection and life safety systems; 4) fire-resistant construction; 5) general fire safety precautions; 6) storage of combustible materials; 7) exits and emergency escapes; and 8) fire alarm systems. The California Fire Code is published at Part 9 of Title 24 of the California Code of Regulations.

Similarly, the Uniform Fire Code Standards, a companion publication to the California Fire Code, contains standards of the American Society for Testing and Materials and of the NFPA. It is the United State s premier model fire code. It is updated annually as a supplement and published every third year by the International Fire Code Institute to include all approved code changes in a new edition.

Applicable local requirements include:

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

SETTING

Recent deregulation of electricity generation in California, as required by AB 1890, included the sale of power generation facilities by regulated utilities to private entities. In accordance with AB 1890, for purposes of safety and reliability, new owners of those electrical generating facilities are required to contract back to the utility for facility operations and maintenance (O&M) for 2 years from the date of closing the sale of the facility. As a result, Duke Energy has contracted for operation and maintenance (O&M) of the existing MLPPP with Pacific Gas & Electric (PG&E) for the period July 1, 1998, through June 2000. Duke Energy will be responsible for MLPPP O&M beginning July 1, 2000. The existing worker health and safety policies in effect at MLPPP include provisions for ongoing operations, including incidental construction activities, and address safety programs, personal protection equipment and fire suppression.
The existing MLPPP facility is located 12 miles northwest of Salinas, California in Monterey County. The authority having jurisdiction for providing fire protection support services for the MLPPPP and vicinity is the North County Fire Protection District (District). The AFC incorrectly states that the Monterey County Fire Department provides fire protection for the MLPPPP. The North County Fire Protection District is a special district separate from County government. The District is formed pursuant to the Health and Safety Code, Part III, Chapter 1 and is governed by an elected five member Board of Directors. The District was originally

formed in 1949 as the Castroville Fire District (CFD) which included Moss Landing. A 1971 annexation brought the area north of Moss Landing and the Elkhorn area into Castroville s jurisdiction and a reorganization in 1982 consolidated CFD with Salinas Rural Fire Station Two area (Prunedale). Construction of the existing MLPPP occurred prior to District input to available fire protection services to support the MLPPP therefore, the existing fire response infrastructure does not adequately support the MLPPP (Pereira, 2000). To the best of the District s knowledge, this project is the first opportunity the District has had to provide an analysis of fire protection services for both the existing MLPPP and proposed modernization project.

District Station One, as shown on **WORKER SAFETY AND FIRE PROTECTION Figure 1**, is the closest station to the MLPPP site. It is located in Castroville, about 3 miles southeast of the MLPPP site and would provide initial emergency response. District Station Three, located in Las Lomas about 7 miles west of the project site, would provide back-up support. In addition to fire response capabilities, these fire stations have first responder HAZMAT capabilities (Pereira, 2000). First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property or the environment from the effects of the release (Title 29, Code of Federal Regulations 1910.120).

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

Type I fire engine is a primary response unit. It has a minimum 400-gallon water tank, a minimum of 1,200 feet of 2 _ hose or larger, 200 feet of 1 hose, a 20 to 24 extension ladder and a 500-gpm heavy stream appliance. This apparatus also has Basic Life Support (BLS) medical treatment capabilities.

An aerial Fire Truck is a primary a response unit (also known as Quints). It has a minimum 500-gallon water tank, a 1,250 gpm pump, 1,000 feet of hose and an aerial ladder with stream capability of 1,000 gpm.

A Type III fire engine is primarily used for fighting wildland fires. It has a minimum 300-gallon water tank, a minimum of 120-gpm pump, 1000 feet of 1 _ hose, and 800 feet of 1 hose and usually comes with 4-wheel drive capability.

Water Tender has a 1,250-gallon water supply, a 500-gpm pump, and an auxiliary 2,000-gallon folding tank.

Rescue Trucks have medical aid capabilities and provide equipment for advanced life support procedures. These procedures are those provided by trained Emergency Medical Technicians and Paramedics. In addition, advanced rescue equipment,

such as vehicle extraction and rope rescue, are carried on the vehicle.

WORKER SAFETY AND FIRE PROTECTION Figure 1

Moss Landing Power Plant — Fire Station Locations

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

Station	Response time	Equipment	Number of Firefighters
North County Fire District Station One 11200 Speegle Street Castroville, CA 95012 (831) 633-2578	3 miles southeast from project site. Estimated response time: 4— 6 minutes	3 — Type I Engines 1 — Water tender 1 — Rescue vehicles 1 — Type III Engine 1 — Utility pick-up	6
North County Fire District Station Two 17639 Pesante Road Prunedale, CA 93907	8 miles west from project site. Estimated response time: 9—11 minutes	2 — Type I Engines 1 — Type III Engine 1 — Utility pick-up	6
North County Fire District Station Three 301 Elkhorn Road Las Lomas, CA 95076	7 miles west from project site. Estimated response time: 8—10 minutes	2 — Type I Engines 1 — Type III Engine 1 — Water Tender 1 — Utility pick-up	6

IMPACTS

PROJECT SPECIFIC IMPACTS

WORKER SAFETY

Industrial environments are potentially dangerous, both during construction and operation of facilities. Workers at the proposed MLPPP will be exposed to loud noises, electrocution, chemical spills, hazardous waste, fires, explosions, moving equipment, falling equipment or structures, trenches, confined space entry and egress problems; and may experience falls, trips, burns, lacerations an numerous other injuries. It is important for MLPPP to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers.

FIRE HAZARDS

During construction and operation of the proposed MLPPP facilities there is the potential for both incipient (small) fires and major structural fires. Incipient fires may be caused by electrical sparks, combustion of fuel oil, natural gas or flammable liquids, explosions, and over-heated equipment. Major structural fires may develop from uncontrolled incipient fires or be caused by large explosions of natural gas or other flammable gasses or liquids.

CUMULATIVE IMPACTS

The only industrial facilities currently proposed to be constructed and operated in the area include the MLPPP and the modification of the existing facilities at the site, that is being permitted by Monterey County. The worker safety and fire hazards associated with the proposed modification of the existing MLPPP are similar to those described above for the MLPPP. The construction and operation of the proposed MLPPP, in combination with the ongoing operation and planned modifications to the existing facilities at the site, will, according to the Chief Pereira, result in a significant cumulative impact on the fire protection and emergency service capabilities of the District.

MITIGATION

MITIGATION OF DIRECT IMPACTS

WORKER SAFETY

A Safety and Health Program will be prepared by the applicant to minimize worker hazards during construction and operation, which will be applicable to both the proposed MLPPP and the modification of the existing facility. Staff uses the phrase Safety and Health Program to refer to the measures that will be taken to ensure compliance with the applicable LORS during the construction and operational phases of the projects.

CONSTRUCTION SAFETY AND HEALTH PROGRAM

The proposed MLPPP includes installation of two combined-cycle units plus installation of four exhaust stacks, and removal of eight existing 225-foot stacks formerly used for existing Units 1-5. In addition to the new combined-cycle units, the project includes the upgrade of existing Units 6 and 7. Therefore, during the construction phase of the project, workers will be exposed to hazards typical of both construction and operation of a gas-fired combined cycle facility.

Construction Safety Orders are published at Title 8 of the California Code of Regulations beginning with section 1502 (8 CCR⁄1502, et seq.). These requirements are promulgated by Cal/OSHA and are applicable to the construction phase of the project. The Construction Safety and Health Program will include the following:

- Construction Injury and Illness Prevention Program (8 CCR⁄1509)
- Construction Fire Protection and Prevention Plan (8 CCR⁄1920)
- Personal Protective Equipment Program (8 CCR⁄⁄1514 - 1522)

Additional programs under General Industry Safety Orders (8 CCR⁄⁄3200 - 6184), Electrical Safety Orders (8 CCR⁄⁄2299 - 2974) and Unfired Pressure Vessel Safety Orders (8 CCR⁄⁄450 - 544) will include:

- Electrical Safety Program
- Unfired Pressure Vessel Safety Orders
- Equipment Safety Program
- Forklift Operation Program
- Excavation/Trenching Program
- Fall Prevention Program
- Scaffolding/Ladder Safety Program
- Articulating Boom Platforms Program
- Crane and Material Handling Program
- Housekeeping and Material Handling and Storage Program
- Hot Work Safety Program
- Respiratory Protection Program
- Employee Exposure Monitoring Program
- Confined Space Entry Program
- Hand and Portable Power Tool Safety Program
- Hearing Conservation Program
- Back Injury Prevention Program
- Hazard Communication Program
- Air Monitoring Program
- Heat and Cold Stress Monitoring and Control Program
- Pressure Vessel and Pipeline Safety Program

The AFC includes adequate outlines of each of the above programs. Prior to construction activities at the Moss Landing facility, detailed programs and plans will be provided pursuant to staff s recommended condition of certification **WORKER SAFETY-1**. During construction, a hazard analysis will be performed to evaluate the hazards and develop appropriate programs/plans to address any hazards that are not covered by the above programs.

OPERATION SAFETY AND HEALTH PROGRAM

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

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

Additional programs under General Industry Safety Orders (8 CCR//3200 - 6184), Electrical Safety Orders (8 CCR//2299 - 2974) and Unfired Pressure Vessel Safety Orders (8 CCR//450 - 544) will include:

- Motor Vehicle and Heavy Equipment Safety Program
- Forklift Operation Program

- Excavation/Trenching Program
- Fall Protection Program
- Scaffolding/Ladder Safety Program
- Crane and Material Handling Program
- Hazard Communication Program
- Hot Work Safety Program
- Respiratory Protection Program
- Electrical Safety Program
- Confined Space Entry Program
- Hand and Portable Power Tool Safety Program
- Housekeeping and Material Handling and Storage Program
- Hearing Conservation Program
- Back Injury Prevention Program
- Safe Driving Program
- Employee Exposure Monitoring Program
- Heat and Cold Stress Monitoring and Control Program
- Pressure Vessel and Pipeline Safety Program

The AFC includes adequate outlines of each of the above programs. Prior to operation of the existing facility modifications, detailed programs and plans will be provided pursuant to the staff s recommended condition of certification **WORKER SAFETY-2**.

SAFETY AND HEALTH PROGRAM ELEMENTS

MLPPP provided the proposed outlines for a Construction Safety and Health Program. The Operation Safety and Health Program is currently in effect at the facility. The measures in these plans are derived from applicable sections of state and federal law. The major items required in both Safety and Health Programs are as follows:

INJURY AND ILLNESS PREVENTION PROGRAM (IIPP)

As required by staff s recommended conditions of certification **WORKER SAFETY-1 and 2**, MLPPP will submit an expanded Construction and Operations Illness and Injury Prevention Program to Cal/OSHA for review and comment 30 days prior to construction of the project.

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

EMERGENCY ACTION PLAN

California regulations require an Emergency Action Plan (8 CCR⁄3220). Volume II of the Business Plan/Contingency Plan is PG&E s existing Facility Emergency

Response Plan (FERP). It provides specific procedures to be followed in the event of an emergency situation. Potential emergencies include, but are not limited to, spill or release of hazardous materials, fire, explosion or natural disaster. According to the applicable regulations, the plan must include the following elements:

- Emergency escape procedures and emergency escape route assignments
- Procedures to be followed by employees who remain to operate critical plant operations before they evacuate
- Procedures to account for all employees after emergency evacuation has been completed
- Rescue and medical duties for employees
- Fire and emergency reporting procedures
- Alarm and communication system
- Contact personnel
- Response procedures for ammonia release (or other hazardous materials)
- Training requirements

Staff s proposed condition of certification **WORKER SAFETY-2**, which requires MLPPP to submit a final Operations Emergency Action Plan for the proposed facility to Cal/OSHA for review and comment after an on-site consultation. It also requires that MLPPP submit the final Operations Emergency Action Plan to the Fire District for review and approval.

FIRE PREVENTION PLAN

California Code of Regulations requires Construction and Operation Fire Prevention Plans (8 CCR/1920 and 3221). The AFC identifies various fire prevention measures, but does not propose specific fire prevention plans. The Construction and Operations Fire Prevention Plans, which are required to be developed by staff s recommended conditions of certification **WORKER SAFETY-1 and 2**, will need to include the following elements:

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

The conditions of certification also require MLPPP to submit a copy of the Construction and Operations Fire Prevention Plans to the Fire District for review,

and to the California Energy Commission Compliance Project Manager (CPM) for approval.

PERSONAL PROTECTIVE EQUIPMENT PROGRAM

California regulations stipulate that Personal Protective Equipment (PPE) and first aid supplies are required whenever hazards are encountered which, due to process, environment, chemicals or mechanical irritants, can cause injury or impair bodily function as a result of absorption, inhalation or physical contact (8 CCR/3380-3400). Given the hazards to which workers will be exposed, as discussed in the Impacts section above, MLPPP will be required to prepare and implement a PPE.

The PPE Program ensures that employers comply with the applicable requirements for PPE and provide employees with the information and training necessary to implement the program. MLPPP provided a satisfactory outline that identifies minimum requirements of a proposed PPE program.

The components of MLPPP s program, as outlined, include:

- Personal Protective Equipment Policy — Presents safety procedures regarding respiratory protection, eye protection, footwear and head protection. It includes the selection of suitable equipment, proper fitting, training, limitations and maintenance.

- Hard Hat Policy — Describes in additional detail the use, inspection and care of hard hats.

- Eye and Face Protection Policy — Describes the requirements for use of approved eye and face protection. It covers numerous types of eye and face protection, respective fit, inspection and care.

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

GENERAL SAFETY

In addition to the specific plans listed above, there are additional LORS applicable to the project, which are called "safe work practices". During the AB 1890 mandated O&M period, work at MLPPP is performed in accordance with the PG&E Code of Safe Work Practices. Following completion of the O&M period, the Duke Energy Code of Safe Work Practices manual will be in effect, and will be made available to each employee. This manual covers basic job safety practices and contains bother general and task-specific work practices. In addition to safe work practices, various existing health and safety policies are in effect at the existing facility. Examples are presented in the following paragraphs.

Safety Action Plan for Contractors

Serves as a guide for contractors to follow in developing their individual safety programs as required by CalOSHA.

Confined Space Entry

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

- Air monitoring and ventilation requirements
- Rescue procedures
- Lock-out / tag-out and blocking, blinding, and blanking requirements
- Permit completion
- Training

Tailgate Briefings Procedure

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

Plant Safety Committee

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

Hazard Communication Program

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

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

FIRE PROTECTION

Staff reviewed the information provided in the AFC regarding available fire protection services and equipment (MLPPP, Section 6.10.1.7 Emergency and Other Services) to determine if the project would adequately protect workers and if it would impact the fire protection and emergency response services of the District. The project will rely on both onsite fire protection systems and the District s fire protection and emergency response services.

The information in the AFC indicates that the existing fire protection system at the site is adequate for fighting incipient fires, and that fighting major structural fires will require the services of the District. The existing fire protection system at the site includes fixed water fire suppression systems, fire hose stations, hydrants, portable fire extinguishers, detection and control systems, and other equipment. The system is designed and operated in accordance with National Fire Protection Association standards and recommendations. The MLPPP will be connected to the existing on-site fire protection system. The AFC states that the existing fire protection system consists of three major firewater system loops with a 50,000-gallon capacity raw water storage tank associated with each loop. Comments from District corrected this information, stating that on-site water storage consists of two (2) storage tanks of 250,000 and 750,000 gallons, for a total of 1,000,000 gallons. Chief Pereira of the District also pointed out that the proposed location of the new combined cycle units indicates the need to remove and add hydrants to the existing fire protection system. Therefore, MLPPP will need to forward plans of the existing underground water system, with proposed changes identified, to the District for review and approval. This requirement is specified in staff s recommended condition of certification **WORKER SAFETY-3**. With this change, the District is agrees that the existing fire protection system at the site will be adequate for fighting incipient fires (Pereira 2000).

Chief Pereira also indicated that there is a deficiency in the District s Initial Attack capabilities in responding to major fires at the MLPPP site for either the existing or the proposed facilities. This deficiency is identified as . . . the lack of elevated stream fire suppression and rescue capabilities by the first responding staffed equipment of the Fire District.

The MLPPP project schematic (figure 2-6) and dimensions (figure 2-7) in the AFC indicate a 69-70 foot tall structure that is approximately 23 feet wide. The total length of the combined cycle unit is estimated at 155 feet minimum. The combined cycle units will be placed back-to-back, with a total minimum combined length of 300 feet. The District does not have a ladder truck in its inventory to provide the elevated stream fire suppression and rescue capabilities required for the project. This capability is only available to the District in response to a mutual aid request and would depend on another agency having a staffed ladder truck available.

As mitigation for the direct impacts of the MLPPP to the District s fire protection and emergency services identified in this analysis, the District is proposing that MLPPP participate in (1) the purchase of a ladder truck that will be located at Station One in

Castroville, and (2) the staffing and training of staff to operate the truck and associated equipment. High Angle and Confined Space Specialist Technicians would be trained to operate the ladder truck, and staffing for three work shifts would need to be provided, including a captain, an engineer and a firefighter. Staff has proposed condition of certification **Worker Safety-4** to assure that the MLPPP s impacts to the District s fire and emergency service capabilities will be mitigated.

MITIGATION OF CUMULATIVE IMPACTS

The worker safety protection programs being proposed by MLPPP will be applicable to the modification and operation of the existing MLPP facility also, and will provide adequate protection for workers at that facility. Staff s recommended condition of certification **Worker Safety-4** will assure that the MLPPP s contribution to cumulative impacts to the District s fire protection and emergency service capabilities will be adequately mitigated.

FACILITY CLOSURE

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

CONCLUSION AND RECOMMENDATIONS

CONCLUSIONS

If MLPPP provides (1) a Construction Safety and Health Plan, and an Operation Safety and Health Plan, as required by conditions of certification **WORKER SAFETY 1** and **2**; (2) the plans of the existing underground water system, with proposed changes identified, to the District for review and approval as required by condition of certification **Worker Safety-3**; and (3) provides funding for additional fire protection services capabilities as required in condition of certification **Worker Safety-4**, staff believes that the project will incorporate sufficient measures to ensure adequate levels of worker safety and fire protection, and comply with applicable LORS

RECOMMENDATIONS

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

PROPOSED CONDITIONS OF CERTIFICATION

WORKER SAFETY-1 The project owner shall submit to the CPM a copy of the Project Construction Safety and Health Program, containing the following:

- a construction Injury and Illness Prevention Program
- a construction Fire Protection and Prevention Plan

- a personal Protective Equipment Program

  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 North County Fire Protection District (NCFPD) for review.

Verification: At least 30 days prior to the start of construction, or a date agreed to by the CPM, the project owner shall submit to the CPM a copy of the Project Construction Safety and Health Program and the Personal Protective Equipment Program, incorporating Cal/OSHA s Consultation Service comments. The project owner shall provide a letter from the NCFPD stating that they have reviewed and reviewed the Construction Fire Protection and Prevention Plan.

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

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

  The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) Consultation Service, 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 NCFPD for review.

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 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.

WORKER SAFETY-3 The project owner shall submit plans of the existing underground water system, including proposed changes, to the North County Fire Protection District for review.

Verification: At least 30 days prior to the start of construction, or a date agreed to by the CPM, the project owner shall submit to the CPM a letter from the North County Fire Protection District stating that they have received and reviewed the plans of the existing underground water system with proposed changes.

WORKER SAFETY-4 At least 60 days prior to any ground disturbance, the project owner shall reach an agreement with the North County Fire Protection District on the amount of fees and timing of payment MLPPP will provide to cover project-specific impacts associated with fire protection and the purchase of a new 65-foot minimum Quint ladder truck equipped for elevated stream fire suppression and high angle and confined space rescues; and first year funding for three new positions for personnel (a captain, an engineer and a firefighter), or the equivalent of the identified staffing as agreed to by the North County Fire Protection District to cover three shifts for the new truck.

Verification: Not later than 30 days prior to any ground disturbance, the project owner shall provide the CPM with a copy of an agreement with the North County Fire Protection District and the owners of the MLPPP for funding of equipment and additional staff.

REFERENCES

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

Pereira, Mark, Fire Chief North County Fire Protection District . Personnel communication with Terri Wallace regarding review of applicant s offsite fire protection. December 14, 1999.

Pereira, Mark, Fire Chief North County Fire Protection District . Personnel communication with Terri Wallace regarding review of applicant s offsite fire protection. January 4, 2000.

Pereira, Mark, Fire Chief North County Fire Protection District. Letter to Terri Wallace with Chief Pereira s comments to the MLPPP project AFC. January 10, 2000.

Pereira, Mark, Fire Chief North County Fire Protection District. Fax to Terri Wallace regarding existing fire equipment and capabilities. January 10, 2000.

Pereira, Mark, Fire Chief North County Fire Protection District. Fax to Terri Wallace regarding copies of local Planning and Building permit conditions. January 10, 2000.

Lukins, Tom. 2000. Oakland Safety Consultant for Cal OSHA Consultation, January 7, 2000.

Moss Landing Power Plant Project. 1999. Application for Certification MLPPP Project (99-AFC-4) prepared by Duke Energy. Submitted to the California Energy Commission, May 7, 1999.

Moss Landing Power Plant Project. 1999b. Application for Certification, Supplement AFC Filing on: Changes in Project Description; Air Quality Increments & Cumulative Impacts Analysis; & Responses to Additional California Coastal Commission Followup Questions. MLPPP Project (99-AFC-4) Submitted to the CEC, October 1, 1999.

TRANSMISSION LINE SAFETY AND NUISANCE

Obed Odoemelam

INTRODUCTION

Duke Energy s proposed modification and improvement of the existing Moss Landing Power Plant will allow the use of the existing transmission system without modification to its constituent lines with regard to voltage, conductor configuration or support structures. The only change to this existing system would be the flow of the additional energy generated from the modified power plant, the Moss Landing Power Project (MLPP). Since magnetic fields are produced during current flow, this added energy would add to the level of magnetic fields in the existing system. The purpose of this analysis is to assess the need for line modifications to reduce the fields from the post-modification system along with their related impacts, which depend on the magnitude of such fields. This assessment will be made by comparing the fields in the post-modification period with fields from lines of the same current-carrying capacity which were designed according to existing laws, ordinances regulations and standards (LORS). Staff s analysis will focus on the issues noted below which relate primarily to the physical presence of each line, or secondarily to the physical interactions of its electric and magnetic fields.

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

If staff finds that operation of the lines as proposed for this project will produce fields and related impacts at levels comparable to similar lines that were designed according to applicable LORS, we will recommend that no further action be required to reduce impacts; if not, we will recommend mitigation.

LAWS ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Discussed below by subject area are design-related federal or state LORS and industry standards and practices applicable to the physical impacts of transmission lines as proposed for use in connection with MLPP. There presently are no local laws or regulations specifically applicable to the physical structure or dimensions of electric power lines to limit the impacts noted above.

AVIATION SAFETY

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

FEDERAL

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

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

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

FEDERAL

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

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

STATE

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

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

AUDIBLE NOISE

INDUSTRY STANDARDS

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

NUISANCE SHOCKS

INDUSTRY STANDARDS

There are no design-specific federal regulations to limit nuisance shocks in the transmission line environment. For modern high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). Nuisance shocks are caused by current flow at levels generally incapable of causing significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line electric and magnetic fields.

As with lines of the type proposed, the applicant will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff usually recommends specific conditions of certification to ensure that such grounding is made within the right-of-way by both the applicant and property owners.

FIRE HAZARDS

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

STATE

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

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

HAZARDOUS SHOCKS

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

STATE

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

Title 8, CCR, Section 2700 et seq., High Voltage Electric Safety Orders . These safety orders establish essential requirements and minimum standards for

safely installing, operating, and maintaining electrical installations and equipment.

INDUSTRIAL STANDARDS

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

ELECTRIC AND MAGNETIC FIELD (EMF) EXPOSURE

The possibility of deleterious health effects from electric and magnetic field exposure has increased public concern in recent years about living near high-voltage lines. Both fields occur together whenever electricity flows, hence the general practice of considering both as EMF exposure. As noted by the applicant (MLPP 1999 pages 6.18-7 and 6.18-8), the available evidence as evaluated by CPUC and other regulatory agencies has not established that such fields pose a significant health hazard to exposed humans. However, staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Therefore, staff 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.

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 PG&E and the other utilities within its jurisdiction to

establish EMF-reducing design guidelines for all new or upgraded power lines and related facilities within their respective service areas. This means that all lines to be used in connection with the proposed MLPP will have to meet the design requirements specified by PG&E for their service area. The CPUC further established specific limits on the resources to be used for each new or upgraded line with regard to redesign to reduce field strengths or relocation to reduce exposure levels. Utilities not within the jurisdiction of the CPUC voluntarily comply with these CPUC requirements. This CPUC policy resulted from assessments made to implement CPUC Decision 93-11-013 of 1989.

In keeping with this CPUC policy, the Energy Commission staff requires evidence that each proposed line will be designed or upgraded 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 or modified line in California is currently required to be designed according to the EMF-reducing guidelines of the utility in the service area involved, its fields are required under existing CPUC policies to be similar, in terms of intensity, 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 as necessary.

INDUSTRIAL STANDARDS

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

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

inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

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

SETTING

According to information from the applicant (MLPP 1999, pages 6.18-1 through 6.18-3), the power from the existing Moss Landing Power Plant is presently transmitted to the PG&E Moss Landing Switchyard adjacent to the plant. This switchyard is an electric distribution center from which power is transmitted to the PG&E transmission grid through a series of long transmission lines extending to at least 12 regional substations in this part of the PG&E service area. These substations also receive electric power from other power stations in California and provide electric power to communities in their general vicinity, as discussed by the applicant. These lines are owned and maintained by PG&E and are to be used, without modification, for the modified power plant.

PROJECT DESCRIPTION

The applicant has provided a detailed listing of the eight existing system 115kV, 230 kV and 500 kV power lines through which the MLPP-generated power will be transmitted. The applicant has also detailed the specific communities served by each line, some of which have been operational for up to 45 years (MLPP 1999 pages 6.18-2 and 6.18-3). The lengths of these lines (from the PG&E Moss Landing Switchyard to the regional substations) range from 14 miles to 70 miles. As is current practice, the power in the post-modification phase will be transmitted in each line at levels that will depend on prevailing need conditions throughout the grid. These lines are located within separate rights-of-way in some areas but share the same rights-of-way with nearby lines in other areas (MLPP 1999 pages 6.18-6 and 6.18-7). They are typically supported by 100 to 150-foot towers as typical of similar lines in the PG&E service area.

IMPACTS

GENERAL IMPACTS

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 is up to each project proponent to apply such measures (to each new or upgraded line) to the extent appropriate for the geographic area involved. It is such field-reducing measures that staff would recommended for this project if we were to find them to be higher than levels we consider appropriate for such lines. The potential for each type of impact is assessed separately for each proposed project.

PROJECT SPECIFIC IMPACTS

IMPACTS FROM PHYSICAL PRESENCE

Staff has assumed that the lines in the existing PG&E transmission system (to be used for this project) were designed according to the previously noted PG&E s design guidelines required under present CPUC policy. Since PG&E established the physical dimensions and conductor configurations of these lines according to their designs bearing on aviation safety, fire hazards, and hazardous shocks, staff considers the use of these lines in the post-modification era to be safe with regard to these impacts.

ELECTRIC FIELD EFFECTS

The potential for electric field-related audible noise, nuisance shocks and interference with radio-frequency communication depends on electric field levels which, in turn, depend on line voltage. Since (a) there will be no change in the voltage of the existing lines and (b) these lines were designed and are presently maintained by PG&E according to PG&E requirements bearing on these electric field effects, staff considers their proposed use in the post-modification era to be appropriate with regard to these electric field effects.

ELECTRIC AND MAGNETIC FIELD EXPOSURE

It is fields from these existing lines that humans will be exposed to along their respective routes. The applicant calculated the maximum electric and magnetic field strengths possible along the existing routes (of between 14 miles and 70 miles) for the system lines that will be affected by the increased power generation

at the proposed project (MLPP 1999 page 6.18-7). Staff has verified the accuracy of the applicant s calculations with regard to factors bearing on field strength and exposure assessment. In their calculations, the application obtained electric field strengths for the existing and post-modification conditions along these routes as a way to demonstrate that these fields will not change in the absence of changes in existing voltages. These calculated values range from 0.15 kV/m to 2.18 kV/m at the edge of the rights-of-way. The maximum value within the right of way is 7.06kV/m. These values are typical of existing PG&E lines of similar voltage.

To assess the project-related increments in magnetic field exposure, magnetic field levels were calculated by the applicant for the existing and post-modification power flow conditions. Existing magnetic fields were calculated to range from 0.3 mG to 45 mG at the edge of the right-of-way. The maximum value within the rights-of-way is 150.2 mG. Maximum fields for the post-modification period range from 2.3 mG to 63.8 mG at the edge of the rights-of-way and from 20.5 mG to 194 mG within the rights-of-way. These field strength increments are as expected in PG&E-designed lines for the increased current flow associated with the plant modification proposed. The calculated maximum values for the post-modification period are within the range associated with PG&E lines of similar voltage and current-carrying capacity. These values as further noted by the applicant (MLPP 1999 page 6.18-10), are within the average range of 150 mG to 250 mG established for transmission lines by the states with regulatory limits.

CUMULATIVE IMPACTS

The strengths of electric and magnetic fields from any proposed line are usually calculated to factor in the interactive effects of fields from nearby lines. The fields calculated to assess the impacts of the modified Moss Landing Plant, reflect the interactive effects of fields from the individual lines that constitute the existing transmission system as it extends from the project site to area substations. Exposures along the route would reflect any cumulative field impacts on exposed humans. Since no separate transmission system is proposed in connection with the proposed modification project, these calculated field values reflect all system exposures of a cumulative nature. As reflected in the calculated values, any such exposures would be similar to exposures associated with similar systems within the PG&E service area.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Since electric or magnetic field health effects have neither been established nor ruled out for lines such as those to be used for MLPP, the public health significance of any existing or post-modification field exposure cannot be characterized with certainty. However, the available evidence, as previously noted, has not established that these lines pose a significant health risk to humans at normally encountered levels. Although the additional current from the proposed MLPP will increase the magnetic fields within some of the lines in the existing

transmission grid, the calculated field strengths suggest that exposure to these fields would be within the range typical of PG&E lines of the same voltage and current-carrying capacity. The potential for nuisance shocks and other field-related impacts will continue to be minimized through current PG&E practices which reflect compliance with GO-90 and Title 8, Section 2700 et seq. of the California Code of Regulations. Since these lines were designed according to PG&E requirements for preventing aviation hazards, staff considers their continued use in the post-modification period to be safe in this regard.

RECOMMENDATIONS

Since (a) the modified Moss Landing Power Project is proposed to be operated without significant modifications to the existing transmission system and (b) the project s operation will result in magnetic field exposure within ranges typical of similar PG&E transmission systems, staff recommends the use of the existing transmission system in the post-modification era, without additional modifications. Staff recommends the following conditions of certification to verify the accuracy of the applicants assumptions with respect to post-modification magnetic field strengths.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall engage a qualified consultant to measure the strengths of line electric and magnetic fields at the points along the routes for which estimates were provided by the applicant

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

REFERENCES

Moss Landing Power Project (MLPP 1999). Application for Certification, (99-AFC-2). Submitted to the California Energy Commission, March 3, 1999.

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

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

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

HAZARDOUS MATERIALS MANAGEMENT

Rick Tyler

INTRODUCTION

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

This analysis does not address potential exposure of workers to hazardous materials used at the proposed facility. Employers must inform employees of hazards associated with their work and thus employees, in exchange for compensation, accept a higher level of risk than would be acceptable for general public exposure. Workers are therefore not afforded the same level of protection normally provided to the public. Further, workers can be provided with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials (see staff s **Worker Safety and Fire Protection** analysis).

The only hazardous material proposed for use at the MLPPP in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j), is aqueous ammonia. The choice to use aqueous ammonia significantly reduces the risk that would be associated with use of the more economical anhydrous form of ammonia. Use of the aqueous form eliminates the high internal energy associated with the more hazardous anhydrous form, which is stored as a liquefied gas at elevated pressure. The high internal energy associated with the anhydrous form of ammonia can act as a driving force in an accidental release which can rapidly introduce large quantities of the material to the ambient air, where it can be transported in the atmosphere and result in high down-wind concentrations. Spills associated with the aqueous form are also much easier to contain than those associated with the anhydrous form. In addition, relatively slow mass transfer from the free surface of the spilled aqueous solution limits emissions from a spill of aqueous ammonia. Analysis of the potential for impact associated with aqueous ammonia deliveries is addressed in staff s **Traffic and Transportation** analysis.

Other hazardous materials stored in smaller quantities, such as mineral and lubricating oils, corrosion inhibitors and water conditioners, will be present at the proposed facility. However, these materials pose no significant potential for off-site impacts as a result of the quantities on site, their relatively low toxicity, and/or their low environmental mobility. Although no natural gas is stored, the project will also involve the construction and operation of short natural gas pipeline connections and handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion.

LAWS, ORDINANCES, REGULATIONS, STANDARDS AND POLICIES

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

FEDERAL

The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III and Clean Air Act of 1990 established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The Act (codified in 40 C. F. R.,／ 68.110 et seq.) requires the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of these Acts are reflected in the California Health and Safety Code, section 25531 et seq.

STATE

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

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

Title 8, California Code of Regulations, Section 458 and Sections 500 — 515, set forth requirements for design, construction and operation of vessels and equipment used to store and transfer anhydrous ammonia. These sections generally codify the requirements of several industry codes, including the ASME Pressure Vessel Code, ANSI K61.1 and the National Boiler and Pressure Vessel Inspection Code. While these codes apply to anhydrous ammonia, they may also be used to design storage facilities for aqueous ammonia.

California Health and Safety Code, section 41700, requires that No person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort,

repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.

LOCAL AND REGIONAL

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

The California Building Code contains requirements regarding the storage and handling of hazardous materials. The Chief Building Official must inspect and verify compliance with these requirements prior to issuance of an occupancy permit. A further discussion of these requirements is provided in the **Facility Design** 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 (Duke Energy, 1999a, AFC Chapter 6.2). This data indicates that wind speeds below one meter per second and temperatures exceeding 100°F can occur in the project area. Therefore, staff suggested that the applicant use F stability (stagnated air, very little mixing), one meter/second wind speed and an ambient temperature of 100° F in its modeling analysis of an accidental release to reflect worst case atmospheric conditions. These conditions were reflected in the modeling used to estimate the potential worst case impacts associated with an accidental ammonia release.

TERRAIN CHARACTERISTICS

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

LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses (Calabrese 1978). Also, the location of the population in the area surrounding a project site may have a large bearing on health risk. The nearest sensitive receptor location is about 2.3 miles from the proposed facility and the nearest residence is 2350 feet from the facility (Duke Energy, 1999a).

IMPACTS

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

AQUEOUS AMMONIA

Aqueous ammonia 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.

Section 6.15 of the AFC included a discussion of the results of modeling for a worst case accidental release of aqueous ammonia. 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 1.5 meters per second and category F stability would exist at the time of the accidental release. This screening analysis was designed to predict the maximum possible impacts based on distance from the storage tank without regard to specific direction of transport. Staff evaluated the model used, the assumptions leading to model inputs and the results of the modeling. Based on this staff concurs with the approach and the results. This analysis indicated that concentrations exceeding 75 PPM would be confined almost completely to the project site and would not affect any public receptor.

NATURAL GAS

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

CUMULATIVE IMPACTS

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

FACILITY CLOSURE

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

MITIGATION

Staff has determined that the proposed mitigation for the MLPPP is adequate to reduce the potential risk of public health impacts associated with accidental hazardous materials accidents to insignificant levels. However, staff proposes a condition requiring development of a safety management plan for delivery of aqueous ammonia, since the MLPPP is not required to develop and implement a Process Safety Plan pursuant to Title 8. The development of a Safety Management Plan addressing delivery of ammonia will further reduce the risk of any accidental release not addressed by the proposed spill prevention mitigation measures associated with the project.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSION

Staff s evaluation of the proposed project (with staff s proposed mitigation measures) indicates that hazardous materials use will pose no potential for significant impacts on the public. With adoption of the proposed conditions of certification, the proposed project will comply with all applicable laws, ordinances, regulations and standards (LORS). In response to Health and Safety Code, section 25531 et seq., the applicant may be required to develop an RMP.[1] The RMP, if required by the Monterey County Department of Health, will be submitted to EPA, the Monterey County Department of Health, and Energy Commission staff for evaluation. To insure adequacy of the RMP, staff s proposed conditions of certification require that the RMP, if required, be submitted for concurrent review by EPA, the Monterey County department of Health, and staff. In addition, staff s proposed conditions of certification also require Monterey County s acceptance of the RMP and staff s approval of the RMP prior to delivery of any hazardous materials to the facility. With adoption of staff s proposed conditions of certification, the project will also comply with Health and Safety Code, section 41700, and it will not pose any potential for significant impacts to the public from hazardous materials releases.

RECOMMENDATION

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

PROPOSED CONDITIONS OF CERTIFICATION

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

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

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

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

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

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

HAZ-4 The aqueous ammonia storage facility shall be designed to either the ASME Pressure Vessel Code and ANSI K61.6 or to API 620. In either case, the storage tank shall be protected by a secondary containment basin capable of holding 150% of the storage volume plus the volume associated with 24 hours of rain assuming the 25 year storm.

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

REFERENCES

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

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

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

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

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

Duke Energy. 1999 a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.

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

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

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

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

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

NRC (National Research Council). 1979. Ammonia. Subcommittee on Ammonia. Committee on Medical and Biologic Effects of Environmental Pollutants. Division of Medical Sciences, Assembly of Life Sciences, National Research

Council (NRC), Baltimore, Maryland, University Park Press (NTIS No. PB 278-027).

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

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

BASIS FOR STAFF S USE OF 75 PPM AMMONIA EXPOSURE CRITERIA

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

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

HAZARDOUS MATERIAL MANAGEMENT
APPENDIX A TABLE 1
Acute Ammonia Exposure Guidelines

Guideline	Responsible Authority	Applicable Exposed Group	Allowable Exposure Level	Allowable* Duration of Exposures	Potential Toxicity at Guideline Level/Intende 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 wor no irreversible health effects in healthy adult 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 exposu for repeated 8 hr. work shifts
ERPG-2[5]	AIHA	Applicable only to emergency response planning for the general population (evacuation) (not intended as exposure criteria) (see preface attached)	200 ppm	60 min.	Exposures above this level entail** unacceptable risk of irreversible effects in healthy adult members of the general population (no safety margin)

1) (EPA 1987) 2) (NIOSH 1994) 3) (NRC 1985) 4) (NRC 1972) 5) (AIHA 1989)
* The (NRC 1979), (WHO 1986), and (Henderson and Haggard 1943) all conclude that available data confirm the direct relationship to increases in effect with both increased exposure and increased exposure duration.
** The (NRC 1979) describes a study involving young animals which suggests greater sensitivity to acute exposure in young animals. The (WHO 1986) warns that the young, elderly, asthmatics, those with bronchitis and those that exercise should also be considered at increased risk based on their demonstrated greater susceptibility to other non-specific irritants.

REFERENCES

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

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

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

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

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

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

ABBREVIATIONS

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

HAZARDOUS MATERIAL MANAGEMENT - not available in on-line version
Appendix B

[Insert here Table 6.15-3 from the AFC (Duke Energy, 1999a)]

WASTE MANAGEMENT

Michael Ringer

INTRODUCTION

This analysis presents an assessment of issues associated with managing wastes generated from constructing and operating the proposed Moss Landing Power Plant Project (MLPPP). 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 wastewater discharged pursuant to National Pollutant Discharge Elimination System (NPDES) permits. Such wastewater is discussed in the **Soil and Water Resources** section of this document.

Energy Commission staff s objectives in its waste management analysis are to ensure that:

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

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

RESOURCE CONSERVATION AND RECOVERY ACT (42 U.S.C. / 6922)

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

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

TITLE 40, CODE OF FEDERAL REGULATIONS, PART 260

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

STATE

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

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

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

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

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

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

LOCAL

There are no local LORS to be considered.

SETTING

PROJECT AND SITE DESCRIPTION

The Project consists of replacing generating units 1 through 5 of the existing Moss Landing Power Plant (MLPP) with two 530 megawatt (MW) combined cycle generating units. The MLPP is an industrial complex with seven generating units, fuel oil storage tanks, seawater inlet and outfall structures, warehouse and office buildings, and other related equipment.

In 1998, Duke Energy purchased the MLPP facility from Pacific Gas and Electric (PG&E), but PG&E retained responsibility for cleaning up onsite contamination created prior to the sale. PG&E commissioned a Phase I Environmental Site Assessment (ESA) at MLPP in April, 1997 (Duke Energy 1999a, AFC p. 6.14-1). 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 Phase I ESA identified a number of environmental conditions at the site, including petroleum hydrocarbons and metals in soils near the fuel oil storage tanks, residual levels of insulating oils containing polychlorinated biphenyls within the switchyards (since remediated), and chromium exceeding background levels in a monitoring well (Duke Energy 1999a, AFC p. 6.14-2).

The Phase I ESA provided the basis for additional sampling and analysis of soil and groundwater performed as part of a Phase II ESA to further define the extent of existing contamination (Duke Energy 1999a, AFC p. 6.14-2). Analytical results of the Phase II investigation helped identify the following four potential remediation issues for identified localized areas at the MLPP (Duke Energy 1999, AFC p. 6.14-3):

- Volatile organic compounds in ground water above applicable maximum contaminant levels (MCLs)
- Chromium in ground water above MCLs
- Petroleum hydrocarbons in groundwater exceeding a threshold concentration of 100 micrograms/liter
- Petroleum hydrocarbons in soil in concentrations exceeding 100 milligrams per kilogram

As noted above, PG&E is responsible for remediating existing contamination at the MLPP site. Pursuant to California Health and Safety Code section 25260 et seq., PG&E requested the designation of an administering agency to oversee site investigation and remedial action at the site. On April 30, 1998, the Site Designation Committee designated DTSC the administering agency (Resolution No. 98-05). As such, it is DTSC s responsibility to administer all state and local laws that govern site cleanup, determine the adequacy and extent of cleanup, and issue necessary authorizations and permits. Following the determination that an approved remedy has been accomplished, DTSC will also issue a certificate of completion. Currently, DTSC, the Regional Water Quality Control Board, and Monterey County are reviewing detailed site investigation documents, and PG&E is awaiting comments. PG&E has issued a report that discusses remediation issues at the site and provides the following recommendations for additional focused investigations for various contaminants (Levine-Fricke 1999):

VOLATILE ORGANIC COMPOUNDS IN THE VICINITY OF THE TECHNICIAN SHOP (NORTH OF UNITS 6 AND 7)

- Trimethylbenzenes and other aromatic compounds were not detected in subsurface soil samples or groundwater samples. Therefore, they are not

considered to be of concern and are not addressed in recommendations for additional work.

- Additional soil samples should be collected to characterize the lateral and vertical extent of volatile organic compounds (VOCs) in soil near the south end of the shop.
- An additional groundwater investigation should be conducted to provide data for characterizing the extent of VOCs. Data from this investigation will provide a basis for determining the locations of future monitoring well locations as necessary.

VOLATILE ORGANIC COMPOUNDS IN THE VICINITY OF THE PAINT YARD AND THE HAZARDOUS MATERIALS STORAGE BUILDING (EAST OF UNITS 4 AND 5)

- A risk assessment based on the Phase II ESA indicates that remediation of VOCs in the soil and groundwater is not necessary.
- Groundwater samples from existing monitoring wells in the area should be collected to monitor current conditions and confirm the conclusions.

VOLATILE ORGANIC COMPOUNDS IN THE CONSTRUCTION WASTE LANDFILL AREA (CENTRAL AREA OF MLPP)

- A risk assessment based on the Phase II ESA indicates that remediation of VOCs in soil and groundwater is not necessary.
- Additional water level measurements should be collected from all site monitoring wells to provide groundwater elevation and flow direction data.
- Groundwater samples from existing monitoring wells should be collected to provide a basis for determining the locations of further monitoring wells.

PETROLEUM HYDROCARBONS IN SOIL AND GROUNDWATER

- Additional groundwater samples from all existing monitoring wells should be collected to determine the current extent of total petroleum hydrocarbons in groundwater and to evaluate any changes when compared to data collected during the Phase II ESA.
- Additional soil and groundwater data in the western area near the shoreline at Moss Landing Harbor should be collected to better characterize the presence of petroleum hydrocarbons there.
- Soil and groundwater samples from beneath the fuel storage tanks should be collected upon their decommissioning to assess whether fuel potentially released from tanks and associated piping has affected soil or groundwater quality.

POLYNUCLEAR AROMATIC HYDROCARBONS IN SOIL AND GROUNDWATER

- A sitewide survey will be conducted to map the types of ground coverings to confirm the association of polynuclear aromatic hydrocarbons (PAHs) with asphalt and other ground-surfacing products.
- Additional groundwater samples from all existing monitoring wells should be collected for PAH analysis to provide current information.

- Soil and groundwater samples from beneath the fuel storage tanks should be collected upon their decommissioning and assessed for PAHs.

METALS IN SOIL AND GROUNDWATER

- A risk assessment based on the Phase II ESA indicates that remediation of metals in soil and groundwater is not necessary.
- Additional soil and groundwater sampling may be recommended if underground piping associated with the metal cleaning waste surface impoundments is found to exist and determined to be a potential source of metals.

CHROMIUM IN SOIL AND GROUNDWATER

- A risk assessment based on the Phase II ESA indicates that remediation of total and hexavalent chromium in soil and groundwater is not necessary based on the range and distribution of hexavalent chromium concentrations.
- Additional groundwater samples from existing monitoring wells will be collected to obtain data about current site conditions and resolve discrepancies in past data.
- In conjunction with proposed sampling, certain parameters will be measured to evaluate whether natural attenuation processes are active in the area. Groundwater sampling may be recommended to confirm the vertical extent of chromium-affected groundwater.
- Additional soil and groundwater sampling may be recommended if underground piping associated with the metal cleaning waste surface impoundments is found to exist and determined to be a potential source of chromium.

IMPACTS

PROJECT SPECIFIC IMPACTS

CONSTRUCTION

Site preparation and construction of the generating plant and associated facilities will generate both nonhazardous and hazardous wastes. Individual contractors are considered to be the generators of construction wastes, and as part of its contract specifications for construction contractors, Duke Energy will require that materials be handled and disposed in accordance with applicable LORS (Duke Energy 1999a, AFC p. 6.14-9).

Nonhazardous waste streams from construction include paper, wood, glass, scrap metal, and plastics, from packing materials, waste lumber, insulation, and nonhazardous chemical containers. Duke Energy estimates that about 40 cubic yards of these types of wastes will be generated on a weekly basis, or a total of about 4300 cubic yards during construction (Duke Energy 1999d, Revised Table 6.14-4).

Hazardous wastes typically generated during construction include waste oil and grease, paint, used batteries, spent solvent, welding materials, and cleanup materials from spills of hazardous substances. Revised Table 6.14-4 (Duke Energy 1999d) lists types, estimated amounts, and management methods of hazardous wastes. Duke Energy estimates that a total of about 100 cubic yards of empty hazardous material containers will be generated, although these may be classified as nonhazardous if they are emptied and managed according to specified methods (22CCR66261.7). Additionally, about 1200 gallons of solvents, used oil, paints, and oily rags will be generated.

In addition to the construction hazardous wastes noted above, there will be additional wastes associated with the demolition of eight 225 foot tall exhaust stacks formerly used for units one through five. Material from demolition of the exhaust stacks may include both hazardous and nonhazardous wastes, depending on analytical results. Portions classified as hazardous would be transported offsite to a Class I (hazardous) disposal facility. Duke Energy estimates that about 500 cubic yards per week of demolition debris from the stacks could be generated, or a total of about 8700 cubic yards over the course of demolition (Duke Energy 1999d, Revised Table 6.14-4).

The project will also include improvements to the cooling water intake structure for units one through five. As part of these activities, collected sediment may have to be removed from the front of the structure. Any silt or related dredge material that is removed will be sampled and tested for DDT contamination (as a result of agricultural runoff), and if necessary, will be disposed of in an approved inland disposal facility. Past dredging at Moss Landing Harbor has resulted in approximately one-third of the spoils requiring removal to the Marina landfill (Duke Energy 1999i, Responses to Additional California Coastal Commission follow up questions, response # 51). The work associated with this activity will encompass an area of less than one-quarter acre, so significant amounts of dredge material are not anticipated to require inland disposal.

OPERATION

The proposed facility will generate both nonhazardous and hazardous wastes under normal operating conditions.

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 are typically minor. Operation of the new combined cycle units is expected to generate about 500 cubic yards of such nonhazardous solid waste on an annual basis (Duke Energy 1999d, Revised Table 6.14-2). Nonhazardous solid waste at MLPP is routinely segregated according to recyclable content to minimize the quantity disposed offsite (Duke Energy 1999a, AFC p. 6.14-5).

Hazardous wastes likely to be generated during routine project operation include spent air pollution control catalysts, used oil and filters, used cleaning solvents, used batteries, and filter press solids. About 3500 gallons of waste oil and 100 tons of hazardous solids are expected to be generated on an annual basis from the new combined cycle units (Duke Energy 1999d, Revised Table 6.14-2). Waste oil is transported offsite to licensed recyclers (Duke Energy 1999a, AFC p. 6.14-7) and hazardous solids are disposed of at various locations, depending on the waste type (Id.).

IMPACT ON EXISTING WASTE DISPOSAL FACILITIES

AFC Table 6.14-3 lists landfills in Monterey County which accept nonhazardous wastes. Solid waste currently generated by MLPP is taken to the Marina Landfill which is operated by the Monterey Regional Waste Management District (Duke Energy 1999a, AFC p. 6.14-5). The Marina Landfill has a permitted disposal capacity of 1200 tons per day and is expected to remain operational until 2090. Project nonhazardous waste generation will be less than 40 tons per week during construction and less than 10 tons per week during operation. Thus, waste generation rates are only a small portion of daily permitted capacity. Even discounting the effects of recycling on the total amount of non-hazardous wastes destined for landfilling, the amounts of waste generated during project construction and operation are insignificant relative to existing disposal capacity.

Three Class I landfills in California, at Kettleman Hills in King s County, Buttonwillow in Ken County, and Westmoreland in Imperial County, are permitted to accept hazardous waste. In total, there is in excess of twenty million cubic yards of remaining hazardous waste disposal capacity at these landfills, with remaining operating lifetimes up to 90 years. The amount of hazardous waste transported to these landfills has decreased in recent years due to source reduction efforts by generators, and the transport of waste out of state that is hazardous under California law, but not federal law.

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

CUMULATIVE IMPACTS

Additional waste management impacts which could contribute to those from construction and operation of the MLPP project include those associated with continued operation of units six and seven at MLPP, demolition of existing fuel oil storage tanks with related environmental remediation, and installation of selective catalytic reduction (SCR) pollution control to units six and seven.

Annual generation of wastes from operation of units six and seven are described in Revised Table 6.14-2 (Duke Energy 1999d). About 680 tons of hazardous solid wastes are generated each year, in addition to the 100 tons from operation of the new units. Nonhazardous solid wastes total about 960 cubic yards annually from the existing units, compared to an estimated 500 cubic yards from the new units.

Demolition of fuel oil storage tanks is a separate project that includes removal and recycling of tanks one through nineteen. Once the tanks are removed, soil or groundwater contamination may be present, and remediation may be required. As noted earlier, PG&E is responsible for remediating existing contamination at the MLPP site, and is doing so under the guidance of DTSC as the designated agency. Until the tanks are removed, the extent of potential contamination is unknown, but is expected to be localized.

Installation of SCR pollution control to units six and seven will not result in any significant waste related impacts. Periodically, the catalysts must be replaced to maintain operating efficiency, and are typically recycled. In the event that recycling is not pursued, the catalyst would require disposal in a class I (hazardous) landfill. The amount of catalyst which must be recycled or disposed is insignificant, on the order of several tons annually.

The quantities of wastes generated during construction and operation of the MLPP project will not result in any significant waste management related impacts. Similarly, quantities of wastes associated with the activities described above, including continued operation of units six and seven, demolition of existing tanks, and installation of SCR catalyst, will not be significant. Considering the lack of impacts on individual disposal facilities and the availability of additional regional landfills, cumulative impacts will be insignificant for both hazardous and nonhazardous wastes.

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, MLPP will develop a facility closure plan at least twelve months prior to commencement of closure and is committed to complying with LORS which are applicable at the time of closure (Duke Energy 1999a, AFC p. 4-3).

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

Energy Commission staff concludes that Duke Energy will be able to comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during MLPP 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, Duke Energy must acquire and maintain an EPA identification number as a hazardous waste generator. Accordingly, Duke Energy 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

Based on the analysis of impacts and the design and operational features that have been incorporated into the project, Duke Energy has not proposed mitigation measures beyond those in place at MLPP (Duke Energy 1999a, AFC p. 6.14-13). However, as part of waste management operations associated with the ongoing operation of MLPP units six and seven, measures are routinely employed to minimize the amounts of wastes generated. The measures are incorporated in the Source Reduction Evaluation Review and Plan, and include recycling, operational improvements, changes in production processes, and administrative controls (Duke Energy 1999a, AFC p. 6.14-5).

As an additional measure to help ensure proper waste management practices, staff proposes that Duke Energy develop and submit a waste management plan which will include details on the handling, packaging, labeling, storage, treatment, and disposal of wastes (proposed Condition of Certification WASTE-3).

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

CONCLUSIONS AND RECOMMENDATIONS

Management of the wastes generated during construction and operation of MLPP will not result in any significant adverse impacts if Duke Energy implements the waste management measures proposed in the Application for Certification (99-AFC-4), the additional measure 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, Duke Energy 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, Duke Energy should also contact representatives of the Monterey County Environmental Health Department and the Berkeley Field Office of the California Department of Toxic Substances Control for possible oversight.

CONDITIONS OF CERTIFICATION

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

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

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

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

WASTE-3 Prior to the start of both construction and operation, the project owner shall prepare and submit to the CEC 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 Monterey County Environmental Health Department and the Berkeley 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.

REFERENCES

Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.

Duke Energy. 1999d. Data Responses 1-24, dated Oct.4, 1999.

Duke Energy. 1999i. Duke Energy Supplementary AFC Filing on: Change in Project Description; Air Quality Increments & Cumulative Impacts Analysis; & Responses to Additional California Coastal Commission Follow Up Questions. Submitted to the California Energy Commission, November 22, 1999.

Levine-Fricke. 1999. Summary of Selected Remedial Issues, Moss Landing Power Plant, Moss Landing, California. Prepared for Pacific Gas and Electric Company. November 29. Submitted to the California Energy Commission, December 6, 1999.

LAND USE

Eric Knight

INTRODUCTION

The Moss Landing Power Plant Project (MLPPP) involves the construction and operation of a new 1,060 MW combined cycle power plant on the site of the existing Moss Landing Power Plant in Monterey County. The land use analysis of the MLPPP focuses on two main issues: the project s consistency with local land use plans, ordinances and policies; and the project s compatibility with existing and planned land uses. In general, an electric generation project and its related facilities can be incompatible with existing and planned land uses when it creates unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts or when it unduly restricts existing or planned future uses.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

STATE

CALIFORNIA COASTAL ACT OF 1976 (PUB. RESOURCES CODE/30000 ET SEQ.)

The California Coastal Act establishes a comprehensive scheme to govern land use planning along the entire California coast. The Coastal Act sets forth general policies (/30200 et seq.) which govern the California Coastal Commission s review of permit applications and local plans. Specific to energy facilities, the Coastal Act requires that the Coastal Commission designate specific locations within the coastal zone where the establishment of a thermal power plant subject to the Warren-Alquist Act could prevent the achievement of the objectives of the Coastal Act (/30413(b)). Pursuant to section 30500, each local government lying within the coastal zone is required to prepare a local coastal program (LCP) for management of that portion of the coastal zone within its jurisdiction. Once the Coastal Commission certifies a LCP, the authority to issue coastal development permits for development within the coastal zone is delegated to the local jurisdiction (/30519(a)). Notwithstanding section 30519(a), section 30600(a) of the Coastal Act specifies that a proponent must obtain a coastal development permit for any development other than a facility subject to the provisions of Section 25500 (i.e., a thermal power plant or related facility subject to the Warren-Alquist Act).

LOCAL

Staff reviewed various Monterey County land-use planning documents relevant to the MLPPP. 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 section entitled **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS**.

MONTEREY COUNTY GENERAL PLAN

The Monterey County General Plan contains countywide goals, objectives, policies, and the countywide land use plan. The General Plan is organized into four components: natural resources, environmental constraints, human resources, and county development. Each of these components addresses subject matter required for one or more of the mandatory general plan elements (land use, circulation, housing, open space, safety, conservation and noise). The General Plan also addresses parks and recreation, public services and facilities, historic preservation, demographics, socioeconomics, and air and water quality. In regard to industrial land use, it is the goal of Monterey County to encourage industrial development which maintains the quality of the environment and is economically beneficial to the area, located in close proximity to major transportation routes, and which is compatible with surrounding land uses (Monterey County, 1982a).

NORTH COUNTY LAND USE PLAN (INCLUDING THE MOSS LANDING COMMUNITY PLAN)

The coastal zone of Monterey County is divided into four planning areas: North County, Big Sur, Carmel, and Del Monte Forest. The MLPPP is located in North County, which includes the unincorporated area of the coastal zone from the Marina City limits to the Santa Cruz County boundary at the Pajaro River, and inland nearly to Highway 101 to include as much as possible of the Elkhorn Slough watershed. The North County Land Use Plan, certified by the California Coastal Commission in 1982, serves as the Local Coastal Program for North County. The plan identifies policies regarding natural resources management, the public service system, land use and development, and public access to the shoreline.

A primary objective of the North County Land Use Plan is to plan for appropriate levels of land use and development in the coastal zone while protecting coastal resources and providing or maintaining coastal access and recreation opportunities. The plan seeks to maintain the rural character of North County, which is characterized by its predominant agricultural, low density residential and open space uses. In regard to industrial development, the plan states that the only industrial facilities particularly appropriate for North County are ones which are coast dependent (Monterey County, 1982b, pp. 47-48).

Incorporated into the North County Land Use Plan is the Moss Landing Community Plan. The plan includes polices pertaining to land use and development, and the protection of the character and visual resources of the Moss Landing community. According to the Moss Landing Community Plan, industries located in Moss Landing are generally dependent on a location near the coastline for their existence. The plan states that these coastal-dependent industries, such as the existing Moss Landing Power Plant, are given priority by the California Coastal Act over other land uses on or near the coast. It is the intent of the Moss Landing Community Plan to encourage coastal-dependent industrial facilities to expand within existing sites, and to allow for the reasonable growth of these industries, consistent with the protection of the area s natural resources (Monterey County, 1982b, p. 62).

MONTEREY COUNTY COASTAL IMPLEMENTATION PLAN (PART 1 AND PART 2)

Part 1 of the Monterey County Coastal Implementation Plan (Title 20, Zoning Ordinance) implements the Monterey County Local Coastal Program. Known as the Coastal Zoning Ordinance, this plan establishes zoning districts, regulations and permit processes for the unincorporated area of the County within the Coastal Zone. Each coastal zoning district specifies the uses that are allowed or may be allowed subject to discretionary permits. Electric power plants are among the principal uses allowed within the Heavy Industrial (Coastal Zone) Zoning District. No building permit, grading permit, or discretionary land use permit may be approved if it is found to be inconsistent with the Monterey County Local Coastal Program (Monterey County, 1995, pp. 1-3, and 118-120).

Part 2 of the Monterey County Coastal Implementation Plan, Regulations for Development in the North County Land Use Plan Area establishes regulations, standards, and procedures to fully implement the policies of the North County Land Use Plan. These regulations apply only to parcels within the North County Coastal Zone. Section 20.144.140 of the plan contains development standards for land use. The intent of this section is to ensure that future development in North County will be consistent with the protection of the area s significant human and cultural resources, agricultural uses, natural resources, and water quality. Also applicable to the proposed project is section 20.144.160, Moss Landing Community Development Standards. The intent of this section is to provide standards that allow the orderly development of the Moss Landing Community and the perpetuation of its coastal-dependent industries (Monterey County, 1988, pp. 1, 83 and 113).

SETTING

The Moss Landing Power Plant is located in the community of Moss Landing, about 12 miles northwest of Salinas. The power plant is situated across Highway 1 from Moss Landing Harbor in an area that includes ocean-dependent industrial facilities, agricultural lands, visitor-serving retail, limited residential, recreational beaches, and tidal wetlands. In North County, industrial uses are concentrated in Moss Landing (Monterey County, 1982a). In addition to the existing Moss Landing Power Plant, these industrial uses include fish and shellfish processing, boat building, and a magnesia and refractory brick factory.

SITE AND VICINITY DESCRIPTION

The existing Moss Landing Power Plant (constructed by PG&E and in operation since 1950) is a 239-acre industrial complex that includes seven electric generation units, ten exhaust stacks, 19 fuel oil storage tanks, and various warehouse and office buildings. The MLPPP consists of replacing the existing electric power generation Units 1-5 (retired in 1995) with two 530 MW, natural gas-fired, combined cycle units. The project also includes the removal of the eight 225-foot tall stacks that were previously used for Units 1-5. Four 145-foot tall exhaust stacks will be constructed in association with the new generation units. No new offsite linear

facilities (electrical transmission lines, natural gas pipelines, water pipelines) will be constructed to serve the MLPPP (Duke Energy 1999a, AFC page 6.9-1).

In addition to the project, several other activities will take place onsite as part Duke Energy s modernization of the Moss Landing Power Plant. These activities include the demolition and removal of 19 fuel oil storage tanks that once fed Units 1-7, and the installation of SCR (air emission control technology) to existing Units 6 and 7, a pair of natural gas-fired steam boiler units built in the 1960s. Monterey County will be the lead agency for environmental review of the tank farm demolition and SCR installation. Please refer to the **PROJECT DESCRIPTION** for a more detailed discussion of the modernization activities at the Moss Landing Power Plant.

The Moss Landing Power Plant site is located at the intersection of Highway 1 and Dolan Road. The site is designated Heavy Industrial (Coast Dependent) by the North County Land Use Plan and the Moss Landing Community Plan. Land-use designations are depicted on **LAND USE Figure 1**[1]. The site is zoned Heavy Industrial: HI (Coastal Zone [CZ]). Zoning designations are shown on **LAND USE Figure 2**.

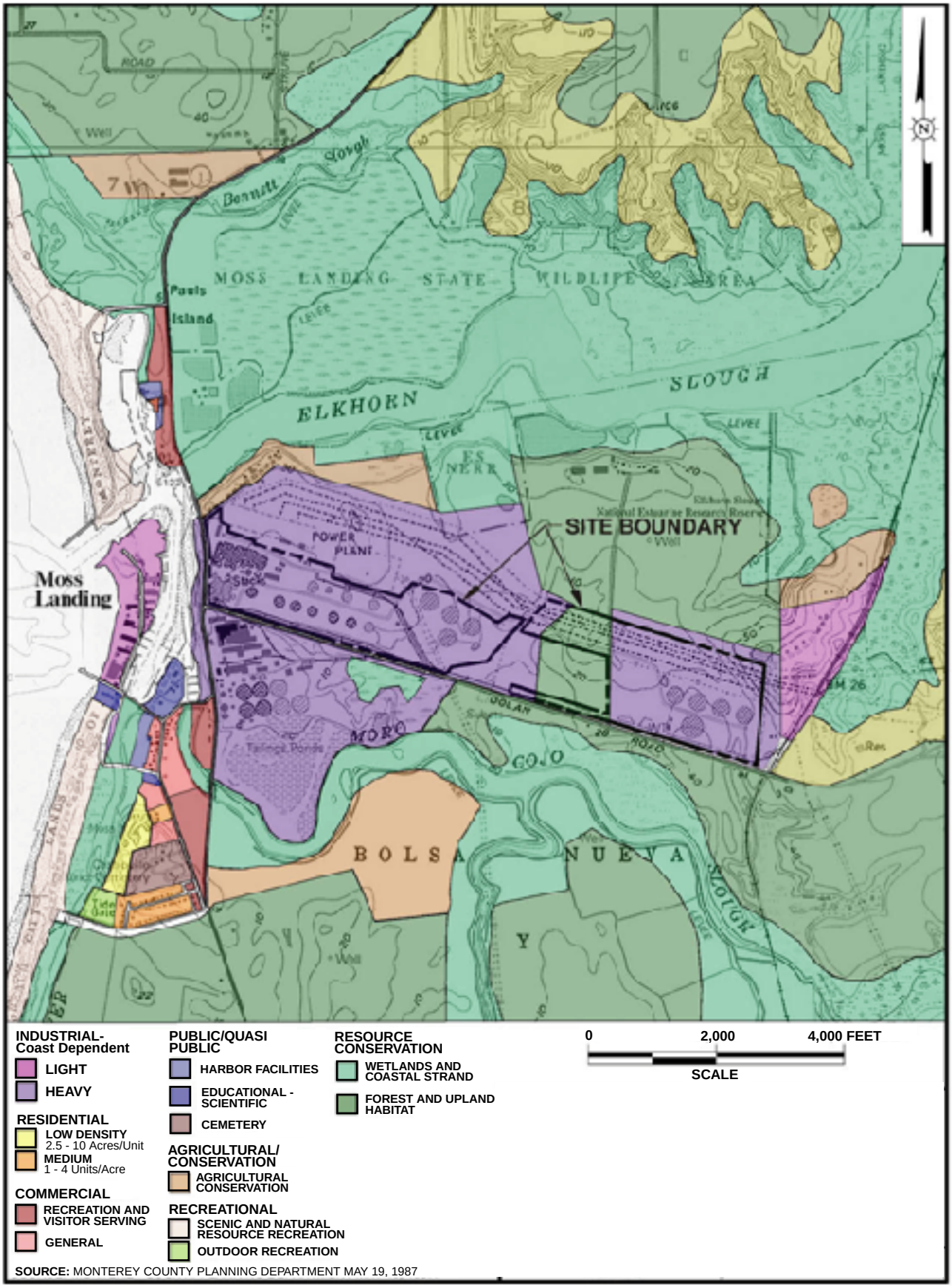
LAND USE Figure 3 shows existing land uses in the vicinity of the Moss Landing Power Plant site. Immediately north and adjacent to the power plant site is the 143-acre PG&E Moss Landing Switchyard. Zoning is HI (CZ). Further north is Elkhorn Slough and wetlands. To the west and across Highway 1 is Moss Landing Harbor. The harbor provides facilities for about 600 commercial and pleasure boats (Duke Energy 1999a, AFC page 6.13-7). Commercial fishing industries, including canneries and fish processing companies, boat storage and repair facilities, marine supply stores, and other related facilities are located on Moss Landing Island (Monterey County, 1982a). Zoning is Light Industrial: LI (CZ). Immediately south of the site and across Dolan Road is the National Refractories magnesia and refractory brick facility. Zoning is HI (CZ). To the east and adjacent to the East Tank Farm portion of the site is the Dolan Industrial Park. Zoning is LI (CZ).

RESIDENTIAL

The nearest residence is located adjacent to the PG&E switchyard approximately 1,500 feet north of the existing Moss Landing Power Plant (Duke Energy 1999a, AFC page 6.12-3). Zoning is Agricultural Conservation: AC (CZ). The nearest cluster of residential uses is located on Potrero Road about one mile southwest of the power plant site (Duke Energy 1999a, AFC page 6.9-1). This residential area is separated from the site by the National Refractories industrial facility, Highway 1, Moro Cojo Slough, and a commercial area along Moss Landing Road. It is zoned

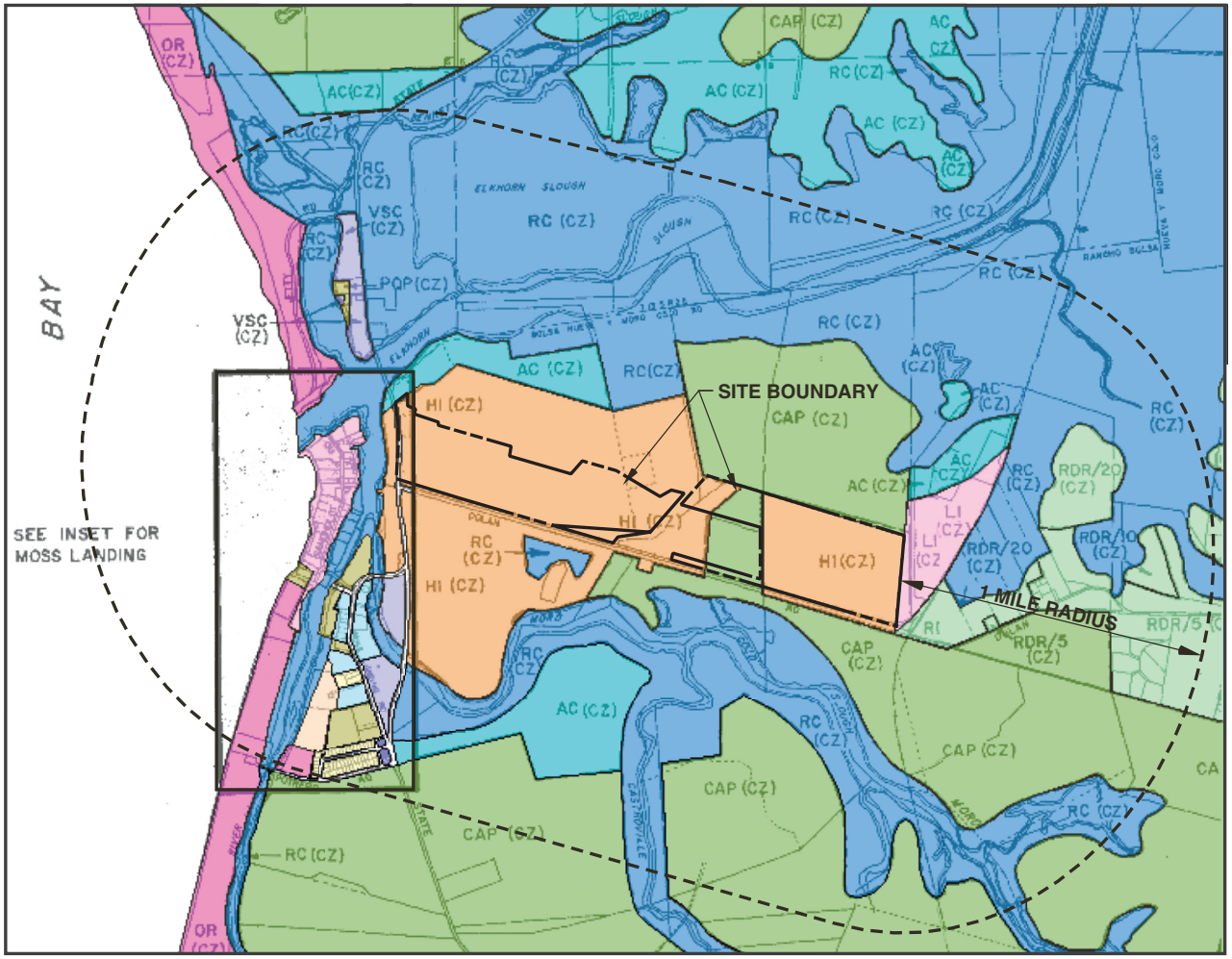
[1] Land Use Figures 1 through 3 are available in color in the AFC and on the Energy Commission s web site at www.energy.ca.gov/sitingcases/mosslanding.

LAND USE - Figure 1
Land Use Designations within Project Study Area

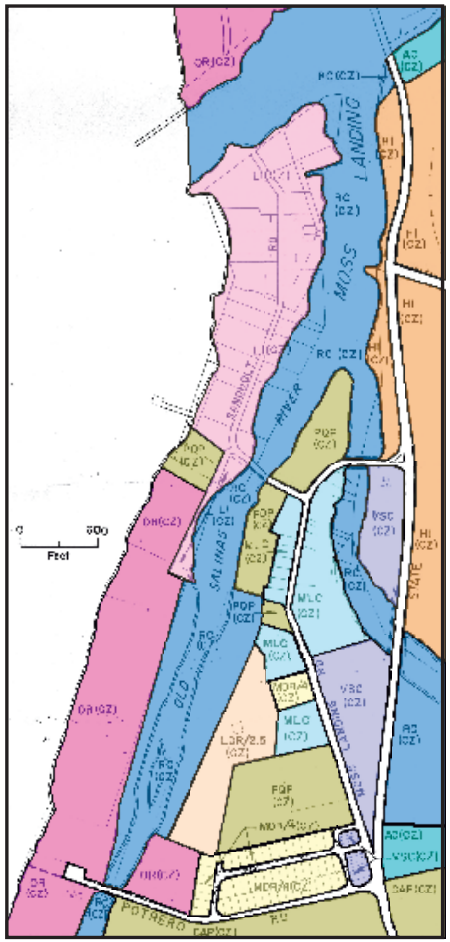


Source: Duke Energy 1999A, AFC Figure #6.9-1

LAND USE - Figure 2
Zoning Districts within One Mile of the Project Site



INSET



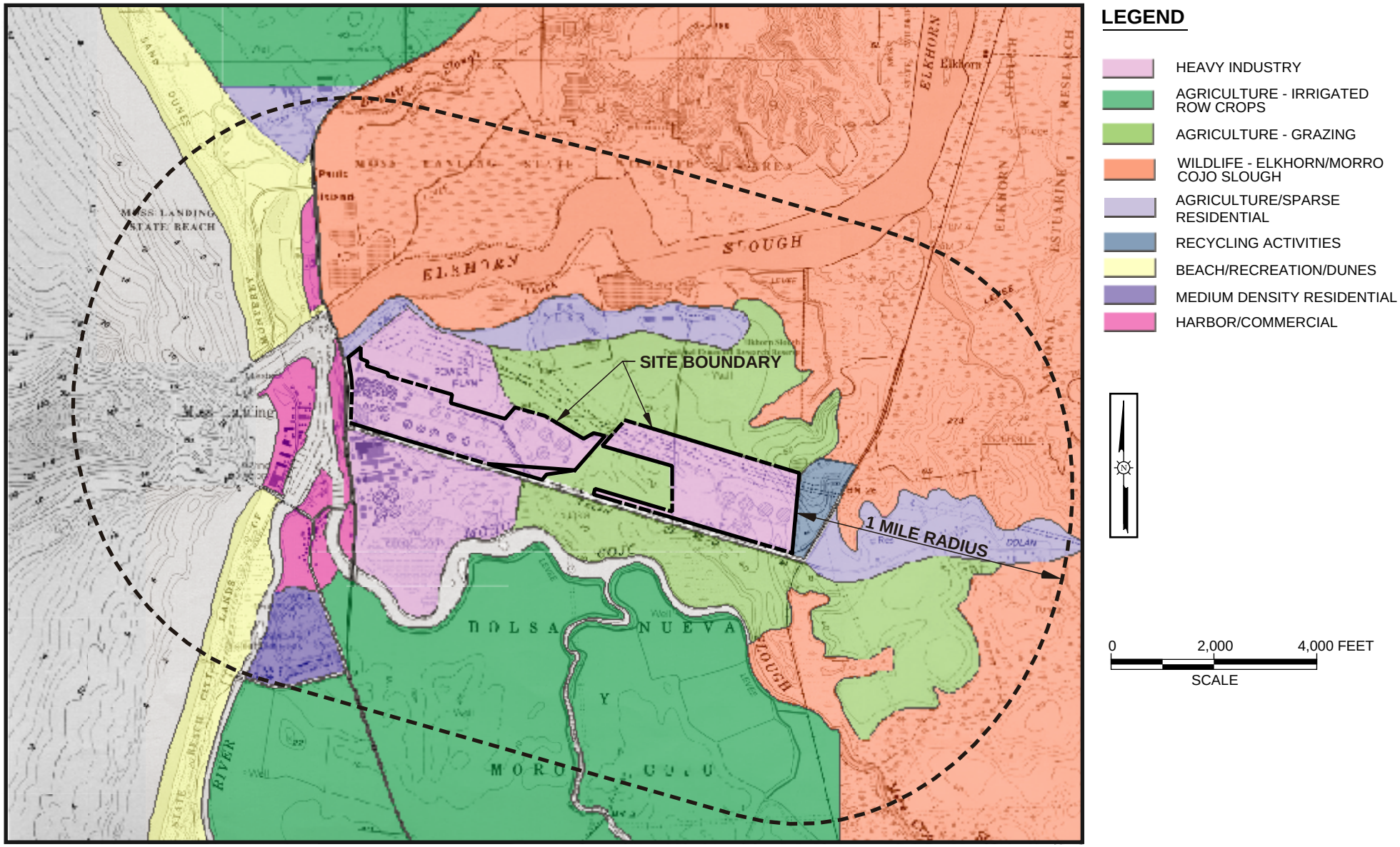
LEGEND

MDR (CZ)	MEDIUM DENSITY RESIDENTIAL	LI (CZ)	LIGHT INDUSTRIAL	OR (CZ)	OPEN SPACE RECREATION
LDR (CZ)	LOW DENSITY RESIDENTIAL	HI (CZ)	HEAVY INDUSTRIAL	PQP (CZ)	PUBLIC/QUASI-PUBLIC
RDR (CZ)	RURAL DENSITY RESIDENTIAL	CAP (CZ)	COASTAL AGRICULTURE CONSERVATION		
MLC (CZ)	MOSS LANDING COMMERCIAL	AC (CZ)	AGRICULTURAL CONSERVATION		
VSC (CZ)	VISITOR SERVING COMMERCIAL	RC (CZ)	RESOURCE CONSERVATION		

0 2,000 4,000 FEET
SCALE

Source: Duke Energy 1999A, AFC Figure #6.9-4

LAND USE - Figure 3
Existing Land Uses within One Mile of the Project Site



Source: Duke Energy 1999A, AFC Figure #6.9-3

Medium Density Residential (1 to 4 units per gross acre): MDR/4 (CZ). Another single residence is located south of the site near the intersection of Moss Landing Road and Highway 1. A small group of residences are located to the east withinone-quarter mile of the East Tank Farm, off of Elkhorn Road. These residences are separated from the tank farm by agricultural uses (Duke Energy 1999a, AFC page 6.9-1). Zoning is Rural Density Residential: RDR (CZ). Development density in this area ranges from 1 unit on 20 acres to a maximum of 1 unit per 5 acres. Nearby residential uses also include boats moored in Moss Landing Harbor and residents living on the Island.

AGRICULTURE

Prime farmland is located approximately 1.7 miles from the Moss Landing Power Plant. Farmland of statewide importance is approximately 1.3 miles, and unique farmland is approximately 1.6 miles from the project site. There are no prime farmlands, farmlands of statewide importance, or unique farmlands located at the project site or within a one-quarter mile radius of the site (Duke Energy 1999a, AFC page 6.4-2).

Agricultural activity immediately to the north, and south (across Dolan Road) of the Middle and East Tank Farm portion of the Moss Landing Power Plant site is primarily cattle grazing (Duke Energy 1999a, AFC page 6.9-4). The Calcagno Dairy Farm and several residences are located in the agricultural area to the north. Zoning designations include Coastal Agriculture Preserve (CAP [CZ]), and AC (CZ). Agricultural land to the south of Moro Cojo Slough and within one mile of the Moss Landing Power Plant site is planted in irrigated row crops, such as artichokes and brussel sprouts (Duke Energy 1999a, AFC page 6.9-4). Zoning is AC (CZ) and CAP (CZ).

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:

- 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.

- Physically divide an established community.

A project may also have a significant impact on land use if it will create unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts or when it precludes or unduly restricts existing or planned future uses.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Public Resources Code section 25525 states that the Energy Commission shall not certify any facility when it finds that the facility does not conform with any applicable state, local, or regional standards, ordinances, or laws, unless the 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 MLPPP is consistent or at variance with each requirement or standard.

CALIFORNIA COASTAL ACT

Pursuant to section 30413(b) of the California Coastal Act, the Coastal Commission shall designate those specific locations within the coastal zone where the location of a facility as defined in Section 25110[2] would prevent the achievement of the objectives of this division; provided, however, that specific locations that are presently used for such facilities and reasonable expansion thereof shall not be so designated. Staff reviewed the Coastal Commission s most recent designation (dated September 1978, revised 1984) of areas unsuitable for thermal power plants. With respect to Moss Landing, the report notes that a large area for potential expansion of PG&E s Moss Landing Power Plant is not designated (CCC 1985, p. 58). The MLPPP will be located entirely within the existing Moss Landing Power Plant site. Consequently, the project is consistent with Coastal Commission policy that prefers onsite expansion of existing power plants to development of new power plants in currently undeveloped areas of the coastal zone (CCC 1985, p. 9).

Notwithstanding the above, the Coastal Act does not preclude local governments from designating areas of the coastal zone as unsuitable for power plants. Section 30005(a) reads as follows:

No provision of this division is a limitation . . . on the power of a city or county to adopt and enforce additional regulations, not in conflict with this act, imposing further conditions, restrictions, or limitations with respect to any land or water use or other activity which might adversely affect the resources of the coastal zone.

MONTEREY COUNTY GENERAL PLAN

CHAPTER IV: AREA DEVELOPMENT

This chapter of the Monterey County General Plan addresses the subject of land use. The following policies are applicable to the MLPPP:

[2] Facility is defined as a thermal power plant or electric transmission line regulated according to provisions of Division 15 of the Public Resources Code (i.e., Warren-Alquist Act).

General Land Use

Goal 26 states that it is Monterey County s goal to promote appropriate and orderly growth and development while protecting desirable existing land uses.
Policy 26.1.6 encourages development that preserves and enhances the scenic qualities of the County.

Policy 26.1.20 states that all exterior lighting shall be unobtrusive and constructed or located so that only the intended area is illuminated, long range visibility is reduced, and off-site glare is fully controlled.

The Moss Landing Community Plan notes that coastal-dependent industries, such as the Moss Landing Power Plant, are given priority by the Coastal Act over other developments on or near the coastline. The Plan reads:

Existing coastal-dependent industries in Moss Landing have local, regional, statewide, and in some cases, national significance. Accordingly, the county shall encourage maximum use and efficiency of these facilities, and allow for their reasonable long-term growth consistent with maintaining the environmental quality and character of the Moss Landing Community and its natural resources (Monterey County 1982, p. 80).

The MLPPP, which will be located entirely within the existing Moss Landing Power Plant site, would represent orderly growth and development of a desirable existing land use. In the **VISUAL RESOURCES** section, staff concludes that the MLPPP will add a noticeable but not considerable increment to the existing industrial character of the Moss Landing area. With mitigation, the MLPPP will not cause a significant adverse impact on the visual resources of the area. For instance, staff has proposed a condition of certification (**VIS-3**) to control off-site lighting and glare. Thus, the MLPPP is consistent with Goal 26 and General Plan Policies 26.1.6 and 26.1.20.

Residential

Policy 27.3.1 discourages new land use activities that are potential nuisances and/or hazards within and in close proximity to residential areas.

The nearest residential area is located on Potrero Road about one mile southwest of the power plant site (Duke Energy 1999a, AFC page 6.9-1). Staff has found that operation of the MLPPP will not cause significant adverse impacts to nearby residential uses. Please see the **NOISE, AIR QUALITY, PUBLIC HEALTH, TRAFFIC AND TRANSPORTATION,** and **VISUAL RESOURCES** sections of this report.

Industrial

Policy 29.1.1 encourages industrial development that is compatible with the environment.

Policy 29.1.2 requires that industrial areas be as compact as possible.

Policy 29.1.3 states that in order to maintain a healthy environment, Monterey County shall allow only those industries that do not violate the County s environmental quality standards.

The new power generation units will be placed where fuel oil tanks 3, 4 and 10 are currently located. These tanks will be removed during the initial phase of the tank farm demolition (Duke Energy 1999a, AFC page 2-13). Removal of the 19 fuel oil tanks will significantly reduce the overall footprint of the Moss Landing Power Plant. The MLPPP and other modernization activities are consistent with Policy 29.1.2, which requires compact industrial areas. There are no County-specific standards for use in evaluating industrial development proposals (Carney, pers. comm., 2000). With mitigation, staff does not expect significant adverse impacts to air quality or cultural resources. Please refer to the **AIR QUALITY** and **CULTURAL RESOURCES** sections of this report. At this time it is not known if the project will cause significant adverse impacts to biological resources and water resources. Please refer to the **BIOLOGICAL RESOURCES** and **WATER RESOURCES** sections.

Agricultural

Goal 30 states that it is Monterey County s goal to protect all viable farmlands designated as prime, of statewide importance, unique, or of local importance from conversion to and encroachment of non-agricultural uses.

Policy 30.0.1 states that the County shall prevent non-agricultural uses that could interfere with the potential of normal agricultural operations on viable farmlands.

The MLPPP will be located entirely within the existing boundaries of the Moss Landing Power Plant. No new offsite linear facilities (e.g., electrical transmission lines) will be constructed to serve the project. Thus, the MLPPP will not convert agricultural land to non-agricultural uses or interfere with agricultural operations on adjacent farmlands

Policy 30.0.2 requires that permanent, well-defined buffer areas are provided as part of new non-agricultural development proposals that are located adjacent to agricultural land uses on viable farmlands.

The new power plant will be located where fuel oil tanks 3, 4 and 10 are currently located. Existing power plant facilities bound this area on the west, north and east. To the south and across Dolan Road, is the National Refractories industrial site. Thus, the MLPPP will not be located adjacent to agricultural land uses, and consequently, will not require buffer areas.

Open Space

Goal 34 states that it is Monterey County s goal to encourage the provision of open space lands as part of all types of development including industrial.

Policy 34.1.1 encourages clustering of all types of development, where appropriate, in order to allow for a portion of each project site to be dedicated as permanent open space.

Policy 34.1.3 states that wherever possible, open space lands provided as part of a development project should be integrated into an areawide open space network.

Policy 34.1.4 states that open space areas should be used as a buffer between land uses of different types and/or intensities.

The permit for the tank farm demolition will require that Duke Energy restore the area currently occupied by the Middle and East Tank Farms to its natural state. However, the County will not apply an open space overlay to the existing heavy industrial zoning designation, which could place a constraint on future expansion of the Moss Landing Power Plant (Carney, pers. comm., 2000). Thus, after the phased demolition of the tank farm is complete, this area of the power plant site will serve as an open space and buffer area, until such time as the facility expands.

Watershed Areas

Goal 35 states that it is Monterey County s goal to recognize the significance of watershed areas in protecting and maintaining the County s natural resources and rural character.

Policy 35.1.1 states that the County shall ensure that land uses in and surrounding critical watershed areas will not compromise the important resource value of these areas.

With mitigation, staff does not expect storm water discharges from the project to have significant adverse effects on the watershed (please see the **WATER RESOURCES** section).

Policy 35.1.2 states that any development in critical watershed areas shall be designed, sited, and constructed in a manner which minimizes negative effects on the watershed.

The MLPPP has been designed to utilize the existing intake structure for Units 1-5 located in Moss Landing Harbor and the existing discharge structure for Units 6 and 7 located in Monterey Bay. The project will not discharge cooling water into Elkhorn Slough (Duke Energy 1999a, AFC page 1-2 and 1-10). Please see the **SOIL AND WATER RESOURCES** section for mitigation to control soil erosion during project construction.

NORTH COUNTY LAND USE PLAN

CHAPTER 4, LAND USE AND DEVELOPMENT

Key Policy 4.3.4 states that all future development within the North County coastal zone must be clearly consistent with the protection of the area s significant human and cultural resources, agriculture, natural resources, and water quality.

Staff has found that with mitigation, the MLPPP will not cause significant adverse impacts to the visual resources and cultural resources of the area (please see the **VISUAL RESOURCES** and **CULTURAL RESOURCES** sections). Staff is evaluating the potential impacts on water and biological resources (i.e., effects of the thermal plume on Monterey Bay, potential for impingement/entrainment of marine life in the cooling water intake structure). At this time, staff does not know if operation of the MLPPP will cause significant adverse impacts to water and biological resources (please see the **WATER RESOURCES** and **BIOLOGICAL RESOURCES** sections).

Policy 4.3.5.1 states that the rural character of the coastal area of North County with its predominant agricultural, low density residential and open space land uses shall be retained. Prime and productive agricultural soils shall be protected for agricultural use.

The MLPPP will be located entirely within the existing boundaries of the Moss Landing Power Plant and requires no new offsite linear facilities (e.g., electrical transmission lines). Thus, the MLPPP will not convert agricultural land to a non-agricultural use.

Policy 4.3.5.6 states that the only industrial facilities appropriate for the area are coastal-dependent industries that do not demand large quantities of fresh water and contribute low levels of air and water pollution. Industries not compatible with the high air quality needed for the protection of agriculture shall be restricted.

The MLPPP, like the existing Moss Landing Power Plant, will use seawater for cooling purposes, thereby minimizing its reliance on fresh water. Emissions from operation of the MLPPP are not expected to exceed the primary standards established for protection of public health. Consequently, emissions would not exceed the less stringent secondary standards established for plants and animals. Therefore, staff does not expect any significant adverse air quality impacts on surrounding agricultural land uses (please see the **AIR QUALITY** section). Staff is evaluating the effects of the thermal plume on Monterey Bay. At this time, staff does not know if the MLPPP will cause significant adverse impacts to water resources.

Policy 4.3.5.8 states that development within the North County coastal zone shall be consistent with the land uses shown on the plan map and as described in the text of the plan.

The MLPPP consists of a new 1,060 MW combined-cycle power plant within the existing Moss Landing Power Plant site. The project site is designated Heavy Industrial (Coast Dependent) by the North County Land Use Plan. The project is compatible with this designation and consistent with the power generation activities that have occurred at the site since 1950.

Policy 4.3.6.F.1 states that lands designated for heavy industrial use in the North County coastal zone shall be reserved for coastal-dependent industry. New heavy manufacturing or energy related facilities shall be located only in areas designated for these uses in the North County Land Use Plan.

Policy 4.3.6.F.2 states that existing industrial uses outside the designated industrial areas are non-conforming uses under the plan and shall not be permitted to expand. The County s general policy is to encourage these uses to relocate to appropriate industrial areas.

The MLPPP is a modernization of the existing Moss Landing Power Plant, which is classified as coastal-dependent industry by the North County Land Use Plan. Like existing Units 6 and 7, the new power generation units also will use seawater for cooling purposes. The MLPPP will be located entirely within the boundaries of the existing power plant site, which is designated Heavy Industrial (Coastal Dependent). Thus, the MLPPP is consistent with Policies 4.3.6.F.1 and 4.3.6.F.2.

Policy 4.3.6.F.4 states that only those industrial uses determined to be compatible with the limited availability of fresh water and the high air quality required by agriculture shall be allowed. New or expanded industrial facilities shall be sited to avoid impacts to agriculture or environmentally sensitive habitats.

The MLPPP will use seawater for cooling purposes, thereby minimizing its reliance on limited fresh water. The MLPPP, which will use natural gas as a fuel, will not cause significant adverse air quality impacts on surrounding agricultural land uses. The project will be located entirely within the existing boundaries of the Moss Landing Power Plant and will not require new offsite linear facilities (e.g., electrical transmission lines). Therefore, the MLPPP will not conflict with agricultural uses in the vicinity. Duke Energy will redesign the cooling water system to enable the new generation units to utilize the existing intake structure for Units 1-5 in Moss Landing Harbor and the existing discharge structure for Units 6 and 7 located in Monterey Bay, thereby eliminating discharge of cooling water into Elkhorn Slough (Duke Energy 1999a, AFC page 1-2). Thus, staff concludes that the MLPPP will be sited to avoid impacts to agriculture and sensitive habitats.

CHAPTER 5: MOSS LANDING COMMUNITY PLAN

The following policies from section 5.5, Energy Facilities and Industrial Development are applicable to the MLPPP.

Key Policy 5.5.1 reads: Existing coastal dependent industries in Moss Landing have local, regional, statewide, and in some cases, national significance. Accordingly, the County shall encourage maximum use and efficiency of these

facilities, and to allow for their reasonable long-term growth consistent with maintaining the environmental quality and character of the Moss Landing Community and its natural resources.

Policy 5.5.3.1 states that due to sensitive agricultural and environmental resources in the proximity of the Moss Landing Power Plant, which could be damaged by coal conversion, the plant should continue operation with the use of natural gas and oil fuels.

The MLPPP will not use coal. The project consists of replacing the existing electric power generation Units 1-5 (a total of 613 megawatts built in the 1950s and retired in 1995) with two 530 megawatt (MW), natural gas-fired, combined cycle units (Duke Energy 1999a, AFC page 2-10). In addition to the project, Duke Energy will make improvements to existing Units 6 and 7, a pair of natural gas-fired steam boiler units, increasing generating capacity by 30 MW (Duke Energy 1999i, page 1). The new units and upgraded Units 6 and 7 will not use fuel oil as a back-up fuel (Duke Energy 1999a, AFC page 1-6). The 19 oil tanks at the Moss Landing Power Plant will be removed. Staff has found that the MLPPP will not significantly alter the visual character of the Moss Landing Community (please see the **VISUAL RESOURCES** section). Operation of the MLPPP is not expected to cause significant adverse air quality impacts to surrounding land uses (please refer to the **AIR QUALITY** section). It is not known at this time if the MLPPP will cause significant adverse impacts to biological and water resources (please refer to the **BIOLOGICAL RESOURCES** and **WATER RESOURCES** sections).

CHAPTER 6: PUBLIC ACCESS

The North County Land Use Plan states that the most suitable locations for physical access along the coast are already in public ownership or have been traditionally used by the public. For instance, the area contains three state beaches (Zmudowski, Moss Landing, and Salinas River) and the Salinas Wildlife Area. The plan further reads:

> In general, adequate access points to the shoreline exist within the North County area. There is a very real problem with the quality of present access opportunities, however. Few developed access sites or *trails* (emphasis added) are to be found outside of the State beaches or Kirby Park. At many shoreline destinations parking is available only at unpaved pullouts which vary in size and degree of hazard to traffic. Many sites have experienced degradation from unsupervised or excessive use; trampling of vegetation, soil erosion, and litter are the results of unmaintained trails (Monterey County 1982b, p. 87).

The Plan identifies specific improvements that could be made to existing access areas.

The Plan states that land use constraints can complicate efforts to provide public access to the shoreline, noting that public access is restricted through the Moss Landing Power Plant property.

Specific policies relevant to public access include:

Policy 6.4.A.1: The County shall require that lateral access easements be provided through private lands in those locations planned for public trails as shown in Figure 6 as a condition to issuance of coastal development permits or other approvals required from the County.

Policy 6.4.A.2: Where specific accessway or trail alignments have not been identified, but where the property in concern is in the immediate vicinity of the trail or accessways shown or proposed in Figure 6, a general offer of dedication will be required. Precise accessway or trail alignments will be agreed upon at a future time through cooperation between the landowner and the public agencies with responsibility for constructing and maintaining the trail.

Figure 6 in the North County Land Use Plan shows a proposed trail running parallel to Highway 1 and passing the Moss Landing Power Plant. The proposed trail would be on the westerly side of Highway 1 (Carney, pers. comm., 2000). The trail would provide a connection between existing coastal trails north and south of the Moss Landing Power Plant that run along Zmudowski State Beach, Moss Landing State Beach, Salinas River State Beach, and Salinas Wildlife Area (Monterey County 1982b). Staff spoke with Bud Carney, a consultant to Monterey County, who stated that Duke Energy would probably have to provide an easement through their property on the westerly side of Highway 1 to accommodate the proposed trail. Mr. Carney stated that it is important to the County to secure an easement for the trail (Carney, pers. comm., 2000). Complicating this issue is long-term plans by Caltrans to widen Highway 1 to a four-lane expressway between Castroville and Watsonville.

Policy 6.4.H.1: New development shall not encroach on well-established accessways or preclude future provision of access.

The new generation units will be located where fuel oil tanks 3, 4 and 10 are currently located. Existing power plant facilities bound this area on the west, north and east. Figure 6 does not indicate any existing or planned trails in this area. Thus, the MLPPP will not encroach on well-established accessways or preclude future provision of access.

The AFC does not include provision of public access as part of the project. Pursuant to section 25529 of the Warren-Alquist Act, the Energy Commission shall require public access as a condition of certification. Section 25529 provides in full:

When a facility is proposed to be located in the coastal zone or any other area with recreational, scenic, or historic value, the [Energy] commission shall require, as a condition of certification of any facility contained in the application, that an area be established for public use, as determined by the commission. Lands within such area shall be acquired and maintained by the applicant and shall be available for public access and use, subject to restrictions required for security and public safety. The applicant may dedicate such public use zone to any local agency agreeing to operate or maintain it for the benefit of the public. If no local agency agrees to

operate or maintain the public use zone for the benefit of the public, the applicant may dedicate such zone to the state. The [Energy] commission shall also require that any facility to be located along the coast or shoreline of any major body of water be set back from the shoreline to permit reasonable public use and to protect scenic and aesthetic values.

Staff has proposed a condition of certification (**LAND-1**) requiring Duke Energy to provide Monterey County with an easement for that portion of the proposed trail passing through Duke Energy s property on the westerly side of Highway 1. Staff has suggested this condition to begin the discussion on provision of public access. If a trail through Duke Energy s property is not feasible, the applicant should provide comparable public access to the satisfaction of Monterey County and consistent with the North County Land Use Plan. The California Coastal Commission has indicated an interest in working with Duke Energy, the Energy Commission, and Monterey County to identify options for providing public access (Ferguson, pers. comm., 2000).

MONTEREY COUNTY COASTAL IMPLEMENTATION PLAN PART 1 (TITLE 20, ZONING ORDINANCE)

CHAPTER 20.28: REGULATIONS FOR HEAVY INDUSTRIAL ZONING DISTRICTS (HI/CZ)

Section 20.28.050: Principal Uses Allowed, Coastal Administrative Permit Required in Each Case (Chapter 20.76) Unless Exempt (Section 20.70.120). This section allows the manufacture of electric power in the HI/CZ District.

The Energy Commission has exclusive authority to certify thermal power plants 50 MW or larger. Because the issuance of a certificate by the Energy Commission is in lieu of any local permit (Pub. Resources Code,/25500), the MLPPP will not require a Coastal Administrative Permit from Monterey County.

Section 20.28.070: Site Development Standards. The section establishes the following development standards[3]:

Section 20.28.070.A.1: The maximum structure height is 35 feet unless superseded by a structure height limit noted on the zoning map.

The height limit for the MLPPP site is 35 feet. The four 90-foot tall Heat Recovery Steam Generators (HRSG) and the four 145-foot tall HRSG stacks will exceed the height limit. This section allows additional height provided that a Use Permit, or in this case a Coastal Administrative Permit, is issued. Before a permit can be issued, the County must make findings necessary to support its decision. Pursuant to Section 20.76.050.C, these findings address, but are not limited to, consistency with the Local Coastal Program, site suitability, environmental issues, and public access. In issuing the permit, the County may require conditions deemed necessary to

[3] The requirements for landscaping (Section 20.28.070.D), exterior lighting (Section 20.28.070.E), and screening of storage areas (Section 20.28.080.A) are addressed in the **VISUAL RESOURCES** section.

secure the purposes of the coastal zoning ordinance and the Local Coastal Program (Section 20.76.050.D). Because the issuance of a certificate by the Energy Commission is in lieu of any local permit, the MLPPP will not be required to obtain a Coastal Administrative Permit. (An exception to the height limit, which may apply to the MLPPP, is discussed later.)

The County has indicated that the primary concern with allowing structures to exceed the height limitation would be the potential impact to coastal visual resources (Carney, pers. comm., 2000). Energy Commission staff has assessed the potential visual impacts of the project from eleven key observation points (KOPs). These KOPs were selected because they represent view areas most sensitive to the project s potential visual impacts, and include recreational areas (Pajaro Dunes, Moss Landing State Beach, Elkhorn Slough Observation Point, Salinas State Beach), residential and commercial areas, and Moss Landing Island. Staff has found that while the MLPPP will be noticeable from many of these KOPs, it will not substantially change the visual character and quality of these views. Furthermore, with mitigation, the MLPPP will not cause a significant adverse impact on the visual resources of the area. These mitigation measures include implementation of: a painting plan to ensure that the MLPPP will not unduly contrast with the surrounding landscape (**VIS-1**); a lighting plan to ensure that project lighting will be adequately designed, shielded, and placed so as to minimize off-site light and glare (**VIS-3**); and a landscaping plan (**VIS-4**). Please refer to the **VISUAL RESOURCES** section for a more detailed discussion of the potential visual impacts of the MLPPP and measures proposed to mitigate those impacts.

<u>Section 20.28.070.B:</u> Building site coverage is restricted to a maximum of 50 percent, excluding parking and landscaping.

<u>Section 20.28.070.C:</u> All parking shall be established pursuant to Chapter 20.58. Section 20.58.040 requires manufacturing uses to provide a minimum of one off-street parking space per 500 square feet of net floor area. Staff has proposed a condition of certification (**LAND-2**) requiring the project to provide sufficient parking in conformance with the zoning ordinance.

<u>Section 20.28.070.F:</u> Signing for all development shall be established pursuant to Chapter 20.60. Signs allowed in the Heavy Industrial Zoning District include the following:

Nameplate and street address signs not exceeding in the aggregate 4 square feet and not to exceed six feet in height for the purpose of identifying the subject property. One sign may be allowed for each street frontage (Section 20.60.050.A.1).

Temporary signs for construction projects to identify the project and those associated with the project subject to the following regulations (Section 20.60.050.A.3):

- There shall be no more than 2 such temporary construction signs per project.

- The signs shall not exceed 24 square feet in area.
- The signs shall not be illuminated.
- If attached to the structure, the signs shall not extend above the roof line or parapet wall of the structure. If freestanding, the maximum height shall be 6 feet.
- The signs shall be stationary.
- The signs shall not be located within any road right-of-way.
- The signs shall be removed at the time of final inspection of the project.

Duke Energy has already obtained approval from the County for their new sign for the Moss Landing Power Plant (Carney, pers. comm., 2000). Staff has proposed a condition of certification (**LAND-3**) that requires temporary signs put up during construction must conform to the zoning ordinance.

CHAPTER 20.62: HEIGHT EXCEPTIONS

Section 20.62.030.C: Any structure in an Industrial District may be erected to a greater height than the district allows, provided that the *cubical contents* of the structure shall not be greater than that possible for a structure erected within the height limit, and provided the design, exterior lighting, siting and landscaping plan for the project is approved by the Planning Commission.

Staff contacted the Zoning Administrator for Monterey County, who stated that this is the height exception that the County would apply if they had jurisdiction over the project (Ellis, pers. comm., 2000). The HI (CZ) District limits lot coverage to a maximum of 50 percent of the site, and limits height to 35 feet. For example, a 20,000 square foot lot would be allowed to have 10,000 square feet (sq. ft.) of building area, with structures up to 35 feet in height. The maximum cubicle contents of the structures would be 350,000-sq. ft. (10,000-sq. ft. multiplied by 35). If the structures covered less ground area, additional height would be allowed, provided that it did not exceed the allowable cubical content (in this example, 350,000 sq. ft). Thus, a 20,000 sq. ft. lot, with 5,000 sq. ft. of building area, could have structures up to a maximum height of 70 feet (5,000 sq. ft. multiplied by 70 is 350,000 sq. ft). By March 1, 2000, Duke Energy should submit evidence to the Energy Commission and Monterey County demonstrating whether the MLPPP would qualify for an exception to the height limit allowing structures up to 145 feet.

MONTEREY COUNTY COASTAL IMPLEMENTATION PLAN, PART 2, REGULATIONS FOR DEVELOPMENT IN THE NORTH COUNTY LAND USE PLAN AREA

LAND USE AND DEVELOPMENT STANDARDS

Section 20.144.140.A.2: All development and use of the land shall conform to the policies of the North County Land Use Plan and to the development standards of this ordinance. *(Ref. Policy 4.3.5.9)*

Section 20.144.140.B.5.c: Development of new or expanded industrial facilities shall only be permitted where able to meet the following criteria:

1. The industry shall be coastal dependent.

2. The industry shall not use quantities of water that will exceed or adversely impact the safe, long-term yield of the local aquifer.

3. Where not preempted by the exclusive authority of a state or federal agency, the County shall require that the industry contribute only low levels of air and water pollution and reduce project pollution to the lowest levels possible for the particular industry. As a condition of approval, all available and feasible mitigation measures shall be incorporated into project design to minimize the amount of air and/or water pollution.

4. The industrial use shall incorporate appropriate buffer zones where located adjacent to agricultural areas, as per Section 20.144.080.D.6.

5. The development shall meet visual resource, environmentally sensitive habitat, and other development standards of this ordinance. (*Ref. Policy 4.3.5.6 and 4.3.6.F.1 and F.4)*

Like the existing Moss Landing Power Plant, the MLPPP will utilize seawater for cooling purposes. Therefore, the MLPPP is coastal dependent (Criteria #1). The use of seawater reduces the MLPPP s demand on limited fresh water sources (Criteria #2).

Provided emissions offsets can be obtained, the MLPPP is not expected to cause significant adverse impacts to air quality. Staff is evaluating the potential impacts of the thermal discharge on Monterey Bay. Please refer to the **AIR QUALITY** and **WATER RESOURCES** sections of this report for a discussion on measures to mitigate adverse impacts to air and water quality (Criteria #3).

The new power plant will be located where fuel oil tanks 3, 4 and 10 are currently located. Existing power plant facilities bound this area on the west, north and east. To the south and across Dolan Road, is the National Refractories industrial site. The MLPPP will not be located adjacent to agricultural areas and, consequently, will not require buffer zones (Criteria #4).

Please refer to the **VISUAL RESOURCES, CULTURAL RESOURCES, BIOLOGICAL RESOURCES** and **WATER RESOURCES** sections for discussion on how the MLPPP will conform to the visual resource, environmentally sensitive habitat, and other development standards of this ordinance (Criteria #5).

MOSS LANDING COMMUNITY DEVELOPMENT STANDARDS

Energy Facilities and Industrial Development

Section 20.144.160.C.1.a: Coastal-dependent industrial facilities shall expand within existing sites before off-site expansion shall be considered. *(Ref. Policy 5.5.2.1 Moss Landing Community Plan)*

The MLPPP will be located entirely within the existing boundaries of the Moss Landing Power Plant.

Section 20.144.160.C.1.c: Future expansion, improvement or other development at the Moss Landing Power Plant shall be considered in accordance with the master plan and associated Environmental Impact Report developed for the facility. Subsequent to County approval of the master plan, permit requests not in conformity with the master plan shall be considered only upon completion and approval of necessary amendments to the master plan. *(Ref. Policy 5.5.2.2 Moss Landing Community Plan)*

According to the AFC, the current Moss Landing Power Plant Master Plan was reviewed and approved by Monterey County in November 1994 (Duke Energy 1999a, AFC page 6.9-8). Duke Energy has submitted an amended Master Plan to Monterey County that describes and evaluates the current modernization activities at the Moss Landing Power Plant. In addition to the MLPPP, these activities include the tank farm demolition and installation of SCR to Units 6 and 7. Monterey County is the lead agency for the CEQA review of the oil tank demolition and SCR. The County will not conduct its own review of the MLPPP, but will rely on the Energy Commission s environmental analysis to make its final decision on the amended Master Plan. Staff is working with the County to determine which document (e.g., Final Staff Assessment, Presiding Member s Proposed Decision) is most appropriate for the County to base its decision on.

Section 20.144.160.C.1.d: For on-site modernization and upgrading of existing facilities, the least environmentally damaging alternative shall be selected. When selection of the least environmentally damaging alternative is not possible for technical reasons, adverse environmental effects of the preferred alternative shall be mitigated to the maximum extent. *(Ref. Policy 5.5.2.3 Moss Landing Community Plan)*

The MLPPP will use natural gas as a fuel for power generation. With mitigation, the project is not expected to cause any significant air quality impacts. Please refer to the **AIR QUALITY** section. Staff is evaluating the potential impacts to water and biological impacts. As part of that analysis, staff will be evaluating alternative cooling technologies. Please refer to the **WATER RESOURCES** and **BIOLOGICAL RESOURCES** sections.

Section 20.144.160.C.1.e: Modernization and expansion of industrial facilities shall be compatible with existing community land use patterns and circulation system

capacities, planning objectives, and local air quality regulations. *(Ref. Policy 5.5.2.4 Moss Landing Community Plan)*

The project site is designated Heavy Industrial (Coast Dependent) by the Moss Landing Community Plan. The MLPPP is consistent with this designation. The MLPPP will be located entirely within the existing boundaries of the Moss Landing Power Plant, consistent with the planning objective of the Moss Landing Community Plan, which prefers onsite expansion of existing coastal-dependent industries to offsite expansion.

Highway 1 and other roadways in the vicinity of the MLPPP are currently operating at unacceptable levels-of-service. Operation of the MLPPP, which will employ approximately 10 new employees, is not expected to significantly impact area roadways. However, construction of the MLPPP will generate a substantial amount of traffic. Please refer to the **TRAFFIC AND TRANSPORTATION** section for a discussion of potential impacts and measures proposed to mitigate those impacts. The MLPPP will comply with air quality regulations and will not cause adverse air quality impacts (please see the **AIR QUALITY** section).

Section 20.144.160.C.1.f: Potentially hazardous industrial development shall not be located adjacent to developed areas. Potentially hazardous development is development found to be harmful to the environment or detrimental to the health, safety, peace, morals, comfort and general welfare of the public or detrimental or injurious to property and improvements in the neighborhood or general welfare of the County. *(Ref. Policy 5.5.2.5 Moss Landing Community Plan)*

The project site is zoned for heavy industrial use. The MLPPP is compatible with the industrial character of the immediate surrounding land uses, which include the 143-acre PG&E substation to the north, the National Refractories magnesia and refractory brick facility to the south, and the commercial fishing industries on Moss Landing Island to the west. Very little residential development exists within one-mile of the project site. Staff has found that the MLPPP will not cause significant adverse effects on nearby land uses (please see the **AIR QUALITY**, **PUBLIC HEALTH**, **NOISE**, and **VISUAL RESOURCES** sections). At this time, it is not known whether the project will cause significant adverse impacts on water and biological resources.

Section 20.144.160.C.1.i: Any structural expansion of the Moss Landing Power Plant shall include plans for major access on Dolan Road including any attendant improvements to Dolan Road and or Highway 1. *(Ref. Policy 5.5.2.7 Moss Landing Community Plan)*

Construction access will occur exclusively through the contractors gate on Dolan Road (Duke Energy 1999a, AFC 6.9-3). The AFC describes several transportation system improvements that will be made as part of the project: a new permanent right-turn lane from northbound Highway 1 to Dolan Road, a new permanent turning lane south bound from Dolan Road onto Highway 1, and new permanent entrance and departure turning lanes from the contractor s gate onto Dolan Road (Duke

Energy 1999a, AFC page 6.11-1). Please refer to the **TRAFFIC AND TRANSPORTATION** section of this report.

Section 20.144.160.C.1.k: All new heavy industry must be coastal-dependent. *(Ref. Policy 5.5.2.10 Moss Landing Community Plan)*

The Moss Landing Community plan classifies the existing Moss Landing Power Plant as a coastal-dependent industrial facility. Like the Moss Landing Power Plant, the MLPPP also will use seawater for cooling purposes. Therefore, the MLPPP is coastal-dependent.

Section 20.144.160.C.1.l: Additional development of environment-polluting heavy industry shall not be permitted. *(Ref Policy 5.5.2.11 Moss Landing Community Plan)*

The MLPPP will not cause significant adverse air quality impacts. At this time it is not known if the project will cause significant adverse impacts on water quality.

Section 20.144.160.C.2.a: Future upgrading or modification of Moss Landing Power Plant generating units 1-5 will require as part of their development plans to limit the cooling water discharge outfall into Elkhorn Slough to the historical discharge rate. *(Ref. Policy 5.5.3.1 Moss Landing Community Plan)*

The MLPPP, which replaces retired Units 1-5, will discharge cooling water to Monterey Bay, not Elkhorn Slough.

Section 20.144.160.C.2.c: In the event that conversion of the Moss Landing Power Plant to a coal-burning facility is proposed, an environmental impact report shall be prepared to determine all effective mitigation measures minimizing adverse effects to air quality, public safety, agriculture and aquaculture. *(Ref. Policy 5.5.3.5 Moss Landing Community Plan)*

The MLPPP will use natural gas, not coal as a fuel for power generation.

Section 20.144.160.C.2.e: For industries with significant emissions, as a condition of issuance of development permits, Monterey County shall require that an atmospheric surveillance station be established in the Moss Landing vicinity at the expense of and by the applicant. This station shall thereafter be operated by the Monterey Bay Unified Air Pollution Control District (MBUAPCD) to monitor air pollution concentrations in addition to pertinent meteorological studies. *(Ref. Policy 5.5.3.8 Moss Landing Community Plan)*

Atmospheric surveillance stations were installed and operated between June 1993 and June 1994 in a cooperative effort between the MBUAPCD, National Refractories, and PG&E (Duke Energy 1999). The MBUAPCD has the discretionary authority to determine if the monitoring station is still necessary. The MBUAPCD has determined that the station is not necessary for the project (Layton, pers. comm., 2000).

Section 20.144.160.C.2.g: Possible future development of a transmission line north from the Moss Landing Power Plant must be compatible with research and educational use of the estuarine sanctuary. Potential environmental effects shall be reduced to an acceptable level before development is allowed. *(Ref. Policy 5.5.3.10 Moss Landing Community Plan)*

The MLPPP does not propose any new offsite linear facilities (e.g., electrical transmission line).

COMPATIBILITY WITH EXISTING AND PLANNED LAND USES

The MLPPP will be located at the site of the Moss Landing Power Plant, which has been in operation since 1950. The project represents further development of a site committed to industrial use, rather than the introduction of industry in a non-industrial area of Monterey County. The Moss Landing Power Plant site is designated Heavy Industrial (Coast Dependent) by the North County Land Use Plan and the Moss Landing Community Plan. The MLPPP 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 Monterey County Local Coastal Program. Furthermore, the project is compatible with the industrial character of the immediate surrounding land uses, which include the 143-acre PG&E Moss Landing Switchyard, the National Refractories magnesia and refractory brick facility, and commercial fishing industries located on Moss Landing Island.

The construction laydown area for the MLPPP will be located where the West Tank Farm (fuel oil tanks #5 — 9) is currently located, and therefore would not conflict with existing or planned land uses. Temporary construction impacts, such as increased dust, noise, and traffic may affect land uses within the vicinity of the project. With mitigation, construction noise impacts are not expected to be significant. Fugitive dust and traffic impacts during construction are anticipated to be significant. Please see the **AIR QUALITY** and **TRAFFIC AND TRANSPORTATION** sections for a discussion of the mitigation measures being proposed by staff (e.g., Best Management Practices for controlling fugitive dust), as well as other measures that will be explored and possibly included in the Final Staff Assessment. Staff has found that operation of the MLPPP will not cause unmitigated, significant adverse noise, dust, public health hazard or nuisance, traffic, or visual impacts on nearby land uses. Please see the **NOISE**, **AIR QUALITY**, **PUBLIC HEALTH**, **TRAFFIC AND TRANSPORTATION**, and **VISUAL RESOURCES** sections.

The MLPPP will not require construction of new offsite linear facilities (electrical transmission lines, natural gas pipelines, water pipelines). Since it will be located entirely within the boundaries of the existing Moss Landing Power Plant, the MLPPP will not disrupt or physically divide an established community, nor convert agricultural land to a non-agricultural use.

The Marine Mammal Center, which currently operates on Duke Energy s property, will be moved from its current location near the cooling water intake structure in Moss Landing Harbor to an existing firehouse building near the East Tank Farm area. This building will provide the Marine Mammal Center with a larger facility in

which to conduct their operations. According to the applicant, the Center does not require a location immediately adjacent to the water for its operations (Duke Energy response to questions from the Coastal Commission, October 25, 1999). Based on the positive comments made by representatives of the Marine Mammal Center at the Committee s Informational Hearing, staff concludes that the move will be beneficial to the Center. Therefore, the MLPPP will not preclude or unduly restrict existing uses.

The AFC identifies four residential developments proposed within 2 to 4 _ miles of the project site (Duke Energy 1999a, AFC pages 6.9-5 — 6.9-6). Of these projects, the Moro Cojo Standard Subdivision has been approved. Another approved project, the Moss Landing Marine Lab, is located on Sandholdt Road approximately one mile west of the project site. The MLPPP would not preclude or unduly restrict these planned projects.

CUMULATIVE IMPACTS

In addition to the MLPPP, other modernization activities occurring at the Moss Landing Power Plant include the phased demolition and removal of the tank farm and the retrofit and upgrade to Units 6 and 7. All of these activities will take place entirely within the Moss Landing Power Plant site, and therefore will not disrupt or physically divide an established community. Nor will these onsite projects preclude or unduly restrict existing or planned land uses. The net effect of these projects will be the reduction in the overall footprint of the Moss Landing Power Plant, a positive cumulative land-use impact.

The tank farm demolition and upgrades to Units 6 and 7 may occur concurrently with construction of the MLPPP. Cumulative impacts, such as increased dust, noise, and traffic may affect nearby land uses. The cumulative, construction noise effects of all these activities are not expected to be significant. Cumulative traffic impacts are not expected to exceed those evaluated for peak construction of the MLPPP. Cumulative dust impacts are anticipated to be significant. Please see the **AIR QUALITY** section for a discussion of the mitigation measures being proposed by staff, as well as other measures that will be explored and possibly included in the Final Staff Assessment.

With mitigation, operation of the MLPPP is not expected to cause significant adverse noise, dust, public health, traffic, or visual impacts, or contribute substantially to any cumulative, indirect land-use impacts. In terms of noise effects, upgrades to Units 6 and 7 will reduce the noise they currently produce. When combined with the noise produced by the MLPPP, a net decrease in noise is anticipated. Thus, the net cumulative impact to nearby land uses will be beneficial rather than adverse (please see the **NOISE** section). This is also the case with cumulative visual impacts of the MLPPP and other modernization activities. The removal of the eight, 225-foot tall stacks, and the eventual phased removal of the fuel storage tanks will considerably reduce the horizontal field of view occupied by the Moss Landing Power Plant (please see the **VISUAL RESOURCES** section). Please also refer to the **AIR QUALITY**, **PUBLIC HEALTH**, and **TRAFFIC AND TRANSPORTATION** sections.

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 MLPPP is 30 years (Duke Energy 1999a, AFC page 4-3). At least twelve months prior to the initiation of decommissioning, Duke Energy will prepare a Facility Closure Plan for Energy Commission review and approval. At the time of closure, all applicable LORS will be identified and the closure plan will discuss conformance of decommissioning activities with these LORS.

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

MITIGATION

Staff has proposed conditions of certification to ensure compliance with the North County Land Use Plan and the Coastal Zoning Ordinance. The project will not comply with the 35-foot height limit in the Heavy Industrial (Coastal Zone) Zoning District. The applicant should submit information to the Energy Commission and Monterey County demonstrating whether the MLPPP would qualify for a height exception to mitigate this nonconformity.

CONCLUSION AND RECOMMENDATON

CONCLUSION

At this time staff cannot conclude that the MLPPP will comply with all applicable land use laws, ordinances, regulations and standards. Staff has found the MLPPP to be consistent with many of the individual goals and policies of the Monterey County General Plan and the Local Coastal Program. In general, the Monterey County Local Coastal Program encourages onsite expansion of existing coastal-dependent industrial facilities, such as the Moss Landing Power Plant. The MLPPP would be consistent with this planning objective. However, onsite expansion must be consistent with the protection of the area s natural resources. At this time it is not known whether the MLPPP will cause significant adverse impacts on biological resources and water resources (please see the **BIOLOGICAL RESOURCES** and **WATER RESOURCES** sections). Furthermore, the project will not comply with the 35-foot height limit in the Heavy Industrial (Coastal Zone) Zoning District. The zoning ordinance provides an exception to the height limit; however, staff needs additional information from the applicant in order to determine if the MLPPP would qualify for the exception to allow for structures up to 145 feet. If the County had

jurisdiction over the project, the additional height also would require County approval of the project s design, exterior lighting, siting and landscaping plan. Staff anticipates that the County will submit a letter to the Energy Commission, providing its comments on all aspects of the project, including the height issue, prior to the Final Staff Assessment. Other issues that need to be resolved are the provision of public access and County approval of the amended Master Plan.

The MLPPP would be compatible with existing and planned land uses because:

- the project is consistent with the current land use and zoning designation of the site;
- the project is compatible with the heavy industrial character of the site;
- the project is compatible with the industrial character of the immediate surrounding land uses;
- the project would not physically divide an established community;
- the project would not preclude or unduly restrict existing or planned land uses; and
- with mitigation, operation of the project would not cause any significant noise, dust, public health, traffic, or visual impacts to nearby land uses.
- Operation of the MLPPP would not contribute substantially to any cumulative land use impacts.

RECOMMENDATION

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

CONDITIONS OF CERTIFICATION

LAND-1 The project owner shall provide Monterey County with an easement for that portion of the proposed trail (identified in the North County Land Use Plan) passing through property owned by Duke Energy on the westerly side of Highway 1.

Verification: At least 30 days prior to start of construction of the MLPPP, the project owner shall submit written evidence to the CEC Compliance Project Manager (CPM) that an offer of general dedication has been made to Monterey County for the proposed trail. At least 90 days prior to commercial operation of the MLPPP, the project owner shall submit evidence to the CPM that the project owner and Monterey County have agreed upon a precise trail alignment.

LAND-2 The project owner shall comply with the parking standards established by the Monterey County Zoning Ordinance (Title 20, Chapter 20.58).

Verification: At least 30 days prior to construction of the MLPPP, the project owner shall submit written evidence to the CPM that the project conforms to all applicable parking standards as established by the Monterey County Zoning Ordinance (Title 20, Chapter 20.58). The submittal to the CPM shall include evidence of review by the County.

LAND-3 The project owner shall ensure that any temporary signs used during construction of the MLPPP comply with the sign regulations established by the Monterey County Zoning Ordinance (Title 20, Chapter 20.60).

Verification: At least 30 days prior to construction of the MLPPP, the project owner shall submit written evidence to the CPM that any temporary signs to be used will conform to the Monterey County Zoning Ordinance (Title 20, Chapter 20.60). The submittal to the CPM shall include evidence of review by the County. Within 15 days after the completion of construction, the project owner shall notify the CPM in writing that all temporary signs have been removed.

REFERENCES

California Coastal Commission (CCC). 1985. Designation of Coastal Zone Areas Where Construction of an Electric Power Plant Would Prevent Achievement of the Objectives of the California Coastal Act of 1976. September 1978. Revised 1984. Re-adopted December 1985.

Carney, (Bud) Anthony J., AICP. 2000. Environmental and Governmental Relations Consultant to Monterey County. Telephone conversations with Eric Knight (California Energy Commission), January 12,13, 22, and 28, 2000.

Duke Energy. 1999. Moss Landing Power Plant Master Plan. Amended September 1999.

Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.

Duke Energy. 1999i. Duke Energy supplemental to the AFC detailing upgrade changes to Units 6 & 7. Submitted to the Energy Commission on November 22, 1999.

Ellis, Dale. 2000. Zoning Administrator, Monterey County. Telephone conversation with Eric Knight (California Energy Commission), January 14, 2000.

Ferguson, Lilli. 2000. California Coastal Commission. Telephone conversation with Eric Knight (California Energy Commission), January 14, 2000.

Layton, Matthew. 2000. Associate Mechanical Engineer. California Energy Commission. Conversation with Eric Knight (California Energy Commission) regarding telephone conversation between M. Layton and Jerry Steele, P.E., Monterey Bay Unified Air Quality Protection District, January 18, 2000.

Monterey County. 1982a. Monterey County General Plan, 1982.

Monterey County. 1982b. North County Land Use Plan, June 1982 (amended May 19, 1987).

Monterey County. 1995. Monterey County Coastal Implementation Plan, Part 1 (Title 20, Zoning Ordinance), August 11, 1995.

Monterey County. 1988. Monterey County Coastal Implementation Plan, Part 2, Regulations for Development in the North County Land Use Plan Area (Chapter 20.144), January 5, 1988.

TRAFFIC AND TRANSPORTATION

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 Duke Energy Moss Landing, Limited Liability Company (applicant) in the Application for Certification (AFC) and the Energy Commission staff (staff) of the potential traffic and transportation impacts (construction and operations) associated with proposed modifications to the Moss Landing Power Plant Project (MLPPP).

These analyses included an 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 transportation of large pieces of equipment can increase roadway congestion and increase traffic hazards. Several minor improvements to the transportation system are proposed with the MLPPP, including additional turn lanes at the Dolan Road/State Route 1 intersection. There will be no construction activities within the public right-of-way associated with the MLPPP. On-going (post construction) operations and maintenance traffic will represent a negligible increase over current conditions; however, it will 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 analyzed the information provided in the AFC and from other sources to determine the potential for the MLPPP to have significant traffic and transportation impacts, and to assess the availability of mitigation measures that could reduce or eliminate the significance of those impacts. Conditions of certification are included to implement the appropriate mitigation measures and to ensure that the project complies with the applicable Laws, Ordinances, Regulations, and Standards (LORS). Recently received information regarding other projects in the area has not been considered in the cumulative impact section of this analysis. Staff plans to provide this analysis in the Final Staff Assessment.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Title 49, Code of Federal Regulations, Sections 171-177, governs the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles.

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

STATE

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

Provisions within the California Vehicle Code are:

- Section 353 defines hazardous materials. California Vehicle Code, Sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- Sections 31600-31620 regulate the transportation of explosive materials.
- Sections 32000-32053 regulate the licensing of carriers of hazardous materials and include noticing requirements.
- Sections 32100-32109 establish special requirements for the transportation of inhalation hazards and poisonous gases.
- Sections 34000-34121 establish special requirements for the transportation of flammable and combustible liquids over public roads and highways.
- Sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-7, 34506, 34507.5 and 34510-11 regulate the safe operation of vehicles, including those which are used for the transportation of hazardous materials.
- Sections 25160 et seq. address the safe transport of hazardous materials.
- Sections 2500-2505 authorize the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives.
- Sections 13369, 15275, and 15278 address the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, the possession of certificates permitting the operation of vehicles transporting hazardous materials are required.
- 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 Street 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.

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

The 1988 Monterey County Coastal Implementation Plan, Chapter 20.144 created development standards regarding major roadways, state highways, and public transit.

The 1987 Monterey County/North County Land Use Plan (Local Coastal) Program established goals and policies regarding the preservation of highway capacity for coastal access.

In response to a statewide law intended to coordinate land use and transportation planning, Monterey County developed a Congestion Management Plan (CMP) that dictates the acceptable service levels on major roadways and intersections. The standards for the CMP roadways and intersections is Level of Service (LOS) D, however, none of the affected intersections are CMP intersections.

The Regional Transportation Plan (RTP) is a compilation of goals, policies, objectives, and projects that guide transportation policy in the region. The RTP provides a framework for evaluating future conditions in the project area.

The Monterey County General Plan, in its transportation and circulation element states that the standard for the roadways and intersections is LOS C.

SETTING

REGIONAL DESCRIPTION

STATE HIGHWAYS AND LOCAL ROADWAYS

The project site is located at the northeast corner of the State Route 1 and Dolan Road intersection in north Monterey County, California. Descriptions of some of the critical roads and highways in the study area are provided below.

Dolan Road extends from its western terminus at State Route 1 (near the MLPPP) to its eastern boundary in the town of Pajaro near Watsonville. Near the site, Dolan Road is 36 feet wide (2-12 lanes and 2-6 shoulders) and carries approximately 3,300 vehicles per day and is under the jurisdiction of Monterey County. The MLPPP site is served primarily from access points along Dolan Road

State Route 1 provides direct access to the site via Dolan Road. State Route 1 traverses most of the state along the coast and is under the jurisdiction of Caltrans. In the vicinity of the MLPPP site, State Route 1 is a two-lane highway with a 45 MPH posted speed and carries approximately 37,500 vehicles per day.

State Route 156 is a two-lane highway that connects State Route 1 with State Route 101. State Route 156 is approximately 4 miles south of the site. Daily traffic

on State Route 156 is 25,000 vehicles per day on the west end (near SR 1) and 27,000 vehicles per day on the east end (near SR 101).

State Route 183 extends from State Route 1 in Castroville to the City of Salinas. It is a two-lane arterial through Castroville, a two-lane rural highway between Castroville and Davis Road, and a four-lane arterial east of Davis Road.

An alternative to State Route 156 for east-west travel is a combination of Dolan Road, Castroville Boulevard, and San Miguel Canyon Road (which connects with State Route 101). Castroville Boulevard is a two-lane rural road carrying approximately 5,500 vehicles per day. San Miquel Canyon Road is also a two-lane rural road. It carries approximately 16,400 vehicles per day.

U.S. Highway 101 serves regional and countywide travel as the major through route for the region. Through Monterey County, it is a four-lane highway with an interchange at State Route 156 and at-grade intersections with county roads.

ACCIDENT HISTORY

Dolan Road (between SR 1 and Castroville Boulevard) has an accident rate of 2.94 accidents per million vehicle miles (MVM) driven. Monterey County considers a rate greater than 4 per MVM as high. Therefore, the accident rate on Dolan Road is considered to be below Monterey County s standard of 4.

Castroville Boulevard has an accident rate of 2.63 accidents per MVM for the segment between State Route 156 and Dolan Road, and a rate of approximately 1.5 accidents per MVM for the segment from Dolan Road to San Miquel Canyon Road. Both of these are below Monterey County s standard of 4.

San Miguel Canyon road has had an accident rate of between 2.5 and 3.8 accidents per MVM for the segment between State Highway 101 and Castroville Boulevard, which is below Monterey County s standard of 4.

Staff is continuing its research into accident rates in the area of the proposed project. Accident data from Caltrans will be discussed in the Final Staff Assessment.

FUNDED AND PLANNED ROADWAY IMPROVEMENTS BY OTHERS

Two local roadway improvement projects in the project area have been assumed to be constructed and in place prior to construction or operation of the MLPPP. One of the projects is the signalization of the SR 156 and Castroville Boulevard intersection which, as of September, 1999, was installed but not yet operational. The other roadway improvement project currently under construction is the Caltrans State Route 1 roadway rehabilitation project. This project includes resurfacing, restriping, new guardrails, and drainage improvements on State Route 1 from the State Route 183 interchange to Salinas Road. As of September, 1999, the resurfacing portion of the project was completed and restriping was underway. At the intersection with Dolan Road, the southbound left-turn lane along State Route 1 providing left-turn access onto Dolan Road has been restriped to a length of 250 feet plus taper.

South of Dolan Road, State Route 1 has been restriped to include a two-way left-turn lane with a length of approximately 100 feet plus taper.

The following is a discussion of planned roadway improvements that are at various stages of development. Some are fully designed and largely funded, but most are largely conceptual and unfunded. None of these improvements are expected to be completed prior to construction or operation of the MLPPP.

Caltrans has long desired to widen State Route 1 to a 4-lane expressway between Castroville and the Santa Cruz County Line, with interchanges at Highway 183 and Salinas Road. At a July 1999 strategy meeting with interested public and private parties, Caltrans identified the following improvement ideas:

- Extend the southbound left-turn pocket at Dolan Road to the Elkhorn Slough Bridge;
- Pavement rehabilitation from State Route 183 north of Salinas Road; and
- Prepare a Project Study Report for long-term improvements between Castroville and Watsonville.

Monterey County has conditioned the Moro Cojo Development with implementing a northbound acceleration lane for the right turn from Dolan Road to State Route 1.

Implementation of the Moss Landing Harbor District Master Plan includes consolidation of the three access points to a single location near the Elkhorn Slough Yacht Club and widening of the Sandholdt Road Bridge.

The proposed Pajaro Valley Golf Course Development expansion may be required to contribute up to $660,000 in traffic mitigation fees that may be used for the Salinas Road/State Route 1 intersection.

The approved History & Heritage Center is required to fund improvements to State Route 1 near the south entrance to Moss Landing at Moss Landing Road and Pieri Court. Caltrans is reviewing the conceptual plans.

Salinas Road is planned to be widened to four lanes with development in the corridor.

San Miguel Canyon Road is planned to be a four-lane highway. Monterey County has been collecting funds to widen the most critical segment (State Route 101 to Castroville Road). Caltrans is planning to construct an interchange (completion expected in 2002) where San Miguel Canyon Road intersects State Route 101.

A seven mile bypass of State Route 101 (approximately 1 mile to the east of the existing alignment) is planned from Russell Road in Salinas to Crazy Horse Canyon Road in northern Monterey County. The project is partially funded at present.

Improvements are planned for State Routes 156 and 183 but nothing is funded or imminent. Davis Road is planned for widening between State Route 183 and Blanco Road, but it is also unfunded.

RAILWAYS

The Union Pacific (previously Southern Pacific) Coast Line runs immediately east of the MLPPP and crosses Dolan Road at a controlled crossing. The Coast Line runs between San Luis Obispo and San Francisco. Freight rail service to the region is provided by the Watsonville Branch Line from the Coast Line. Spur lines run to the MLPPP site from the Coast Line.

The Watsonville Branch connects Watsonville and Gilroy, but it only services a few trains per year.

PUBLIC TRANSPORTATION

Monterey County has three primary bus carriers: Monterey-Salinas Transit, Amtrak, and Greyhound. Monterey-Salinas Transit provides fixed route service in the unincorporated areas and the cities of Carmel, Marina, Del Rey Oaks, Monterey, Pacific Grove, Seaside, and Salinas. They also connect with Santa Cruz County service in Watsonville.

Amtrak provides bus service connecting Monterey and Salinas with its rail service in San Jose.

Greyhound provides relatively infrequent service connecting several cities in the region.

TRUCK ROUTES

Monterey County has adopted super truck routes, which are meant to concentrate truck traffic to the benefit of local roadways that either have pavement sections that are incompatible with large trucks or significant congestion. The super truck routes in the vicinity of the project are: State Routes 1, 68, 101, 156, and 183.

Monterey County has not adopted local weight or load limitations. Therefore, the California Vehicle Code limits apply to all study roadways (including state routes). These limits are 20,000 pounds per axle and 10,500 per wheel or wheels on one end of the axle.

CURRENT ROADWAY AND INTERSECTION OPERATING CONDITION

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 LOS can range from A , representing free-flow conditions with little or no delay, to F , representing saturated conditions with substantial delay. A LOS C threshold, as noted above, is the minimum standard accepted by Monterey County.

Exhibit 5 in the Application for Certification summarizes the current performance levels of the principal roadways in the project area. The following roadway segments are operating at a level worse than the LOS C standard:

- State Route 1 (State Route 156 to State Route 183);
- State Route 1 (State Route 183 to Dolan Road);
- State Route 1 (Dolan Road to Salinas Road);
- State Route 1 (Salinas Road to State Route 129);
- Salinas Road (State Route 1 to Wermer Road);
- San Miguel Canyon Road (U.S. Highway 101 to Prunedale North);
- San Miguel Canyon Road (Prunedale North to Castroville Boulevard);
- San Miguel Canyon Road (Castroville Boulevard to Echo Valley Road);
- U.S. Highway 101 (throughout the study area);
- State Route 156 (Castroville Boulevard to U.S. Highway 101);
- State Route 183 (Davis Road to Espinosa Road);
- State Route 183 (Espinosa Road to Blackie Road);
- State Route 183 (Blackie Road to State Route 156); and
- Davis Road (Central to State Route 183).

Dolan Road and Castroville Boulevard are operating at an acceptable LOS.

Exhibit 13 in the Application for Certification summarizes the current performance levels of the principal intersections in the project area. The following unsignalized intersections are operating at a level worse than the LOS C standard:

- State Route 1 and Salinas Road (AM and PM peak hours);
- State Route 1 and Dolan Road (PM peak hour);
- Prundale Road North and State Route 156 (PM peak hour); and
- State Route 1 and State Route 183 (PM peak hour).

The unsignalized intersection of State Route 1 and Dolan Road provides a major access point to the MLPPP site. While the overall AM peak hour operation is LOS A, the westbound (Dolan Road) left-turn movement is operating at LOS F. During the PM peak hour, the overall operating condition is LOS F with the westbound (Dolan Road) left-turn movement operating at LOS F and the right-turn movement operating at LOS D. In addition, the sight distance is limited at the intersection when looking south from Dolan Road. Sight distance is the continuous length of highway ahead visible to the driver. Stopping sight distance is measured from the driver s eyes to an object on the road. Field observations were conducted to assess the driver visibility at the intersection. The current sight distance from Dolan Road to the south is limited to approximately 380 feet. The minimum stopping sight distance is the distance required by the driver of a vehicle, traveling at a given rate

of speed, to bring his vehicle to a stop after an object on the road becomes visible. There are limited acceptable gaps in traffic on State Route 1, which may contribute to drivers taking imprudent risk in trying to enter from Dolan Road.

Exhibit 13 in the Application for Certification indicates that the current performance levels of the principal signalized intersections in the project area are operating at or above the LOS C standard.

IMPACTS

PROJECT SPECIFIC IMPACTS

CONSTRUCTION PHASE

LINEAR FACILITIES

The MLPPP is not proposing to construct any transmission, natural gas, sewer, or water lines within the public right-of-way. Therefore, no traffic impacts are expected from such activities.

If the circumstances should change, resulting in the need to construct transmission, gas, water, or sewer facilities within or adjacent to a public right-of-way, then a construction traffic control plan will be needed and should comply with Caltrans Manual of Traffic Controls for Construction and Maintenance of Work Zones (Caltrans 1996).

COMMUTE AND VISTOR TRAFFIC

Construction workers will park on-site. However, no information is provided in the AFC regarding where the workers will park, and the applicant has not indicated whether off-site parking and busing of construction workers to the project site is acceptable.

Construction is expected to last a total of 24 months, with most activities occurring on weekdays and some on Saturday. Exhibit 14 in the AFC summarizes the staffing and trip generation expected during the construction phase. The estimated average number of workers traveling to/from the site on a typical day is 242, with most working a day shift that starts between 5:30 and 6:30 AM and a small portion working a swing shift. During the peak month, approximately 732 workers are expected on a typical weekday, of which most will be on a day shift.

Visitor traffic was estimated at 5% of staffing, which equates to 12 persons per day on average and 37 persons per day during the peak month period.

Estimates of the number of trips by construction workers and visitors is based upon a conservative assumption that most workers are driving alone to/from the site. During the peak construction period, the combination of commute and visitor traffic is expected to generate approximately 644 trips during the hours of 5:30 — 6:30 AM

and 80 trips during the ambient peak period of 7:30 — 8:30 AM. The trip generation will be reduced to 213 and 26, respectively during average construction periods. In the morning, approximately 90% of the trips will be inbound to the site.

During the peak construction period, the combination of construction workers and visitors will generate approximately 651 trips during the hours of 3:00 — 4:00 PM and 80 trips during the ambient peak period of 4:30 — 5:30 PM. The trip generation will be reduced to 220 and 26, respectively during average construction periods. Most (approximately 90%) of the afternoon trips will be outbound from the site.

The AFC estimated the location of the potential workforce based upon population and distance from the MLPPP. The calculation included Monterey, Santa Cruz, San Benito, and Santa Clara County. Using this approach, the AFC concluded that 47% of the construction workers will come from areas to the north and 53% from the south.

TRUCK TRAFFIC

The AFC suggests that rail will be emphasized versus long-haul trucks as a means to deliver equipment and materials to the site and to remove demolition debris. Rail will also be used to deliver heavy equipment such as generators, turbines, and stacks.

The transportation and handling of hazardous substances associated with the MLPPP 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.

Product deliveries via truck traffic will contribute, along with other MLPPP-generated traffic, to create localized impacts to roadway performance. During the first three months of construction, truck deliveries are expected to total approximately 1,000. Consequently, on a typical day, the MLPPP would generate more than 100 trips per day. Up to 20 trips per hour will likely occur during the peak commute periods.

The AFC predicts that the spatial pattern of truck trips will be similar to commute trips in that slightly more than half of the trips (53%) will come from the south and these truck trips will use routes similar to the construction workers.

TOTAL PROJECT CONSTRUCTION TRAFFIC

Exhibit 14 in the AFC includes estimates for total project construction traffic. The total traffic associated with construction personnel, visitors and construction equipment during peak staffing is estimated to generate 1,690 trips during an average day.

During the peak construction period, the combination of commute and visitor traffic is expected to generate approximately 645 trips during the hours of 5:30 — 6:30 AM and 81 trips during the ambient peak period of 7:30 — 8:30 AM. The trip generation will be reduced to 215 and 30, respectively during average construction periods. In the morning, approximately 90% of the trips will be inbound to the site.

During the peak construction period, the combination of construction workers and visitors will generate approximately 652 trips during the hours of 3:00 — 4:00 PM and 81 trips during the ambient peak period of 4:30 — 5:30 PM. The trip generation will be reduced to 219 and 30, respectively during average construction periods. Most (approximately 90%) of the afternoon trips will be outbound from the site.

ROADWAY AND INTERSECTION OPERATING CONDITIONS

The combination of commute, truck, and visitor traffic will degrade roadway operations in the localized area. While the addition of project construction traffic will not change the level of service on any road segments, the project will result in increases in traffic on roadways already operating worse than the LOS C threshold. The following road segments will operate below the LOS C threshold, the minimum standard accepted by Monterey County:

- State Route 1 (State Route 156 to State Route 183);
- State Route 1 (State Route 183 to Dolan Road);
- State Route 1 (Dolan Road to Salinas Road);
- State Route 1 (Salinas Road to State Route 129);
- Salinas Road (State Route 1 to Wermer Road);
- San Miguel Canyon Road (U.S. Highway 101 to Prunedale North);
- San Miguel Canyon Road (Prunedale North to Castroville Boulevard);
- San Miguel Canyon Road (Castroville Boulevard to Echo Valley Road);
- U.S. Highway 101 (throughout the study area);
- State Route 156 (Castroville Boulevard to U.S. Highway 101);
- State Route 183 (Davis Road to Espinosa Road);
- State Route 183 (Espinosa Road to Blackie Road);
- State Route 183 (Blackie Road to State Route 156); and
- Davis Road (Central to State Route 183).

The combination of commute, truck, and visitor traffic will degrade intersection operations in the localized area. The addition of project construction traffic will degrade the level of service at the intersection of San Miguel Canyon Road and Castroville Boulevard during the PM peak from LOS B to LOS D during the project peak hour. The project will also result in increases in traffic at intersections already operating worse than the LOS C threshold. The following intersections will operate worse than the LOS C threshold, the minimum standard accepted by Monterey County:

- State Route 1 and Salinas Road (AM and PM peak hours);
- State Route 1 and Dolan Road (PM peak hour);
- Prundale Road North and State Route 156 (PM peak hour); and
- State Route 1 and State Route 183 (PM peak hour).

Staff has identified physical improvements at the intersections of State Route 1 and Dolan Road, and Dolan Road and the power plant s contractor driveway. These improvements will mitigate project traffic impacts at those locations, thereby reducing a potential significant impact to less than significant. Impacts on the other roadway segments and intersections are proposed to be mitigated by a Traffic Control Plan and/or Transportation Demand Management Plan coordinated with Monterey County and Caltrans.

RAILWAYS

The AFC suggests that rail will be emphasized versus long-haul trucks as a means to deliver equipment and materials to the site and to remove demolition debris. Rail will also be used to deliver heavy equipment such as generators, turbines, and stacks. The existing spur line to the site from Watsonville has only been used a few times in the last two years according to the AFC. Consequently, deliveries via rail should not disrupt any existing Union Pacific operations. The use of the spur line for deliveries to the site has the potential to increase conflicts between trains and automobiles at at-grade crossings.

OPERATIONAL PHASE

COMMUTE AND VISITOR TRAFFIC

The operational phase of the MLPPP will add only 20 persons to the existing 88 employed at the site. Exhibit 22 in the AFC indicates that the project is expected to add approximately a total of approximately 67 daily vehicle trips. The project is expected to add 18 a.m. and 18 p.m. peak hour trips.

TRUCK TRAFFIC

The transportation and handling of hazardous substances associated with the MLPPP can increase roadway hazard potential. The existing site averages 10 — 15 truck trips per day on a typical weekday. The MLPPP will utilize rail as a primary means to deliver large materials; however, the MLPPP will add one additional truck delivery per week according to the AFC.

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.

IMPACTS TO ROADWAY OPERATIONS

The MLPPP-generated traffic of 67 trips per day will contribute in a small way to the congestion in the local region; however, this will not create any significant traffic problems in and of itself. However, these new trips are subject to the County s Traffic Impact Mitigation Fee Program, since these trips would be on facilities operating below the LOS C threshold, the minimum standard accepted by Monterey County.

RAIL FACILITIES

The MLPPP will receive hazardous materials, in the form of ammonia, via rail. The MLPPP is expected to use 40,000 gallons of ammonia per month, and the ammonia will be delivered in DOT-approved 23,000 gallon tank cars. These deliveries, along with other supplies, are expected to occur twice per month via the rail spur.

The inherent conflicts between rail and passenger vehicles along the rail spur creates a potential impact from the delivery of any hazardous materials.

CUMULATIVE IMPACTS

In addition to the traffic generated by MLPPP construction activities, the applicant will also be performing additional construction operations on the existing power plant. These additional activities will start prior to MLPPP construction; however, some of the additional construction activities are anticipated to occur concurrently with MLPPP construction. Two peak periods of approximately 3 months each are anticipated to occur prior to peak project construction staffing. At its maximum, the cumulative total of other power plant construction activities and project construction staffing will number 720 workers, which is less than the 732 workers expected on a typical weekday during peak month project construction activity. Therefore, the impacts are not expected to exceed those evaluated above for peak project construction periods.

The AFC does not identify any off-site development projects in the study area that would generate additional traffic during the MLPPP construction phase. However, the North County area will likely continue to experience development during the 24-month construction period. Consequently, traffic volumes on the roadways in the vicinity of the MLPPP will likely increase. Staff is evaluating information regarding other planned projects in the MLPPP vicinity, however, at this time, no conclusions can be drawn on the traffic impacts that could occur from the traffic generated by off-site developments during the MLPPP construction period. Any improvements to

State Route 1 will likely require approval by the California Coastal Commission and modifications to the Coastal Act.

There are 40 identified long-term developments in various stages of approval or implementation throughout the north Monterey County area. Exhibits 26 through 31 of the AFC provide information on these development projects including location, land use, size and estimated trip generation. These development projects are estimated to generate a total of 12,500 daily trips with 1,460 occurring during the morning peak hour and 1,625 occurring during the evening peak hour. In addition, there is expected to be a substantial amount of population growth in the City of Salinas and on the Monterey Peninsula. This additional regional growth is expected to increase traffic an additional 1 to 2 percent per year on the State highway system for the next 20 years. Consequently, traffic volumes on the roadways in the vicinity of the MLPPP will likely significantly increase. The MLPPP s level of traffic generation will diminish between the construction and operational phases. Exhibit 22 in the AFC indicates that the MLPPP is expected to add a total of approximately 67 daily vehicle trips during normal operations. The MLPPP is expected to add 18 a.m. and 18 p.m. peak hour trips. Based on information contained in the AFC, the MLPPP will add one additional truck delivery per week. The additional trips generated the MLPPP are not considered significant.

MLPPP should be aware that Caltrans has plans to construct the section of State Route 1 in the vicinity of the power plant as a 4-lane facility. The owners of the MLPPP may have to set-aside right-of-way for this road-widening project, the extent to which will need to be coordinated with Caltrans.

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 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 MLPPP closure on traffic and transportation will be similar to those discussed for the project itself. Closure will create traffic levels that are similar in intensity and duration to those expected during facility construction. The removal of waste and other materials will produce impacts from truck traffic. At this time, no specific conclusions can be drawn on the effects of project closure on traffic and transportation.

MITIGATION

APPLICANT PROPOSED MITIGATION

The applicant has indicated its intention to comply with all LORS relating to the transport of oversize loads and the transport of hazardous materials. The applicant has also proposed to make physical improvements at two locations prior to the start of construction. These improvements are:

State Route 1/Dolan Road. The applicant should construct channelization improvements at this location. Specifically, the applicant should design and construct a westbound to northbound acceleration lane and a northbound right turn lane on State Route 1 at Dolan Road. The applicant should also lengthen the westbound left turn lane on Dolan Road. These mitigation measures should be in place prior to the start of construction of the MLPPP.

Contractors Driveway/Dolan Road. The applicant should construct channelization and capacity improvements at this location. Specifically, the applicant should design and construct a westbound right turn lane, an eastbound left turn lane, and a southbound left turn median acceleration lane on Dolan Road at the Contractor s driveway. These mitigation measures should be in place prior to the start of construction of the MLPPP.

The applicant could contribute a fair share payment (based upon their operational traffic levels) towards any physical improvements required at the State Route 1 and Dolan Road intersection. Any prorata contribution agreement would need to be negotiated with Monterey County and Caltrans.

STAFF PROPOSED MITIGATION

The applicant should work with the Public Utilities Commission, Caltrans, California Highway Patrol, and Monterey County to develop and implement a plan to manage traffic at the at-grade crossings along the railroad spur line during periods of high activity.

The applicant should manage the on-site construction-period parking.
Repair any roadways damaged during MLPPP construction to their pre-project construction condition.

Prepare construction traffic control plan and implementation program, to the satisfaction of Monterey County and Caltrans, establishing schedules for major shifts outside of the adjacent traffic street peak periods and timing of heavy vehicle equipment and building materials deliveries. This traffic control plan should also include:

- MLPPP construction truck traffic (including any vehicle used in the transport of hazardous materials) should be restricted from making a left turn from westbound Dolan Road onto southbound State Route 1.
- MLPPP construction truck traffic (including any vehicle used in the transport of hazardous materials) should be restricted from making a southbound left turn from State Route 1 onto Dolan Road.
- MLPPP construction truck traffic (including any vehicle used in the transport of hazardous materials) should be restricted from making a right turn from westbound Dolan Road onto northbound State Route 1.

- Utilize existing rail service for the delivery of construction materials and for the export of construction and demolition debris.
- Establish and implement a Transportation Demand Management (TDM) Plan to help mitigate traffic impacts during MLPPP construction. The applicant should coordinate with the Association of Monterey Bay Area Governments (AMBAG) to develop carpool and vanpool programs. These programs should include establishing park and ride lots in Watsonville and Salinas where the construction workers could park and then be transported to the MLPPP site via carpools and/or transit or shuttle buses. In addition, the applicant should investigate the use of the existing rail line for the delivery of construction workers to the MLPPP site.
- The new trips generated by the project during the operational phase are subject to the County s Traffic Impact Mitigation Fee Program, since these trips would be on facilities operating below the LOS C threshold, the minimum standard accepted by Monterey County. Therefore, MLPPP will be required to pay a fee, based on net new trip generation, as established by Monterey County.

COMPLIANCE WITH LORS

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

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

CONCLUSIONS AND RECOMMENDATIONS

Staff has insufficient information at this time to fully reach conclusions regarding potential impacts on traffic and transportation. As stated previously, staff is reviewing information regarding other proposed projects in the vicinity that must be included in the cumulative impact analysis, and information from Caltrans on area accident rates has not been received or analyzed.

The conditions of certification proposed below are those that staff has identified as necessary based on the information available to date. Staff expects to make some changes to this analysis and possibly the proposed conditions of certification in the Final Staff Assessment, based on the analysis of the information described above, as well as comments received on the Preliminary Staff Assessment.

CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall comply with California Department of Transportation (Caltrans) and Monterey 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 for both rail and roadway use.

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

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

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

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

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

TRANS-4 Following construction of the power plant and all related facilities, the project owner shall repair roadways affected by project construction traffic to original or as near original condition as possible.

Protocol: Prior to start of construction, the project owner shall photograph sections of public roadways that will be affected by project construction traffic. The project owner shall provide the CPM, Monterey 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 project 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, Monterey County and Caltrans to determine and receive approval for the actions necessary and schedule to complete the repair of identified sections of public roadways to original or as near original condition as possible.

TRANS-5 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 a parking and staging plan for all phases of project construction to Monterey County for review and comment, and to the CPM for review and approval.

TRANS-6 Prior to any earth moving or disturbance activity for development of the MLPPP, the project owner shall complete the construction of an acceleration lane on State Route 1 (SR-1) for westbound to northbound vehicles; a northbound right turn lane on SR-1 at the intersection of SR-1 and Dolan Road; and lengthen the westbound left turn lane on Dolan Road. The design plans for these improvements shall be submitted to Caltrans, the Coastal Commission and Monterey County for review and comment, and to the CPM for review and approval.

Protocol: The project owner shall, in coordination with Caltrans, the California Coastal Commission and Monterey County, design and construct the roadway improvements described above.

Verification: At least 120 days prior to any earth moving or disturbance activity for development of the MLPPP, the project owner shall submit design plans to Caltrans, the California Coastal Commission, and Monterey County for review and comment, and to the CPM for review and approval. At least 30 days prior to any earth moving or disturbance activity for development of the MLPPP, the project owner shall notify the CPM that the roadway improvements have been completed and are ready for inspection.

TRANS-7 Prior to any earth moving or disturbance activity for development of the MLPPP, the project owner shall complete the construction of a westbound right turn lane and an eastbound left turn lane, and an eastbound median acceleration lane on Dolan Road at the contractor s driveway. The design plans for these improvements shall be submitted to Caltrans, the Coastal Commission and Monterey County for review and comment, and to the CPM for review and approval.

Protocol: The project owner shall, in coordination with Caltrans and Monterey County, design and construct the roadway improvements described above.

Verification: At least 120 days prior to any earth moving or disturbance activity for development of the MLPPP, the project owner shall submit design plans to the California Coastal Commission and Monterey County for review and comment, and to the CPM for review and approval. At least 30 days prior to any earth moving or disturbance activity for development of the MLPPP, the project owner shall notify the CPM that these roadway improvements have been completed and are ready for inspection.

TRANS-8 Prior to any earth moving or disturbance activity for development of the MLPPP, the project owner shall submit a construction traffic control and

implementation plan to Monterey County and Caltrans for review and comment, and to the CPM for review and approval.

Protocol: The project owner shall develop the construction traffic control and implementation plan in coordination with Monterey County to meet their needs to the extent feasible. Specifically, this plan shall include the following restrictions on construction traffic:

1). MLPPP construction truck traffic (including any vehicle used in the transport of hazardous materials) should be restricted from making a left turn from westbound Dolan Road onto southbound State Route 1.
2). MLPPP construction truck traffic (including any vehicle used in the transport of hazardous materials) should be restricted from making a southbound left turn from State Route 1 onto Dolan Road.
3). MLPPP construction truck traffic (including any vehicle used in the transport of hazardous materials) should be restricted from making a right turn from westbound Dolan Road onto northbound State Route 1.

Verification: At least 60 days prior to any earth moving or disturbance activity for development of the MLPPP, the project owner shall submit a construction traffic control and implementation plan to Monterey County and Caltrans for review and comment, and to the CPM for review and approval.

TRANS-8 Prior to any earth moving or disturbance activity for development of the MLPPP, the project owner shall submit a Transportation Demand Management Plan to Monterey County and Caltrans for review and comment, and to the CPM for review and approval.

Protocol: The project owner shall develop the Transportation Demand Management Plan in coordination with Monterey County to meet their needs to the extent feasible.

Verification: At least 60 days prior to any earth moving or disturbance activity for development of the MLPPP, the project owner shall submit the Transportation Demand Management Plan to Monterey County and Caltrans for review and comment, and to the CPM for review and approval.

TRANS-9 Prior to any earth moving or disturbance activity for development of the MLPPP, the project owner shall make all necessary arrangements to allow the use of the existing rail line for delivery of construction materials and export of construction and demolition debris.

Protocol: The project owner shall reach an agreement with the owner of the rail line to make necessary repairs to the line and to permit use of the line for the purposes described above.

Verification: At least 120 days prior to any earth moving or disturbance activity for development of the MLPPP, the project owner shall reach an agreement with the

owner of the rail line to make necessary repairs to the line and to permit use of the line for the purposes described above.

TRANS-10 Prior to any earth moving or disturbance activity for development of the MLPPP, the project owner shall pay a fee to Monterey County s Traffic Impact Mitigation Fee Program based on net new trip generation, as established by Monterey County.

Verification: Within 30 days of project certification, the project owner shall submit to the CPM proof that the County Traffic Impact Mitigation Fee has been paid to Monterey County.

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.

Monterey County, Monterey County Coastal Implementation Plan Part 1, Title 20 Zoning Ordinance, August 1995.

Duke Energy North America, Moss Landing Power Plant, Response to Project Data Requests, October 1999.

Duke Energy North America, Moss Landing Power Plant, Response to California Energy Commission Data Requests, November 1999.

Duke Energy North America, Moss Landing Power Plant Application for Certification Supplementary Filing, Change in Project Description and Responses to California Coastal Commission Follow Up Questions, November 1999.

Duke Energy North America, Moss Landing Power Plant Application for Certification Supplementary Filing, Attachment 1 Traffic Analysis Report, November 1999.

NOISE

Steve Baker

INTRODUCTION

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

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

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

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C.⁄651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R.⁄1910.95) 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 (see **Noise: Appendix A, Table A4** immediately following this section). OSHA regulations also dictate hearing conservation program requirements and workplace noise monitoring requirements.

There are no federal laws governing offsite (community) noise.

STATE

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

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

CALIFORNIA ENVIRONMENTAL QUALITY ACT

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

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

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

CAL-OSHA

Cal-OSHA has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8,⁄⁄5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards described above.

LOCAL

MONTEREY COUNTY GENERAL PLAN NOISE ELEMENT

Two policies enunciated in this noise element (Monterey 1995) impact the construction and operation of a project such as the MLPPP. Policy 22.2.1 requires that new projects conform to the exterior noise parameters established in Table 6, Land Use Compatibility for Exterior Community Noise Environments. Table 6 specifies that noise levels from 50 to 70 dBA L_{dn} or CNEL[1] are normally acceptable for industrial or utility land use categories such as the MLPPP.

Policy 22.2.5 requires that ambient sound levels be less at night (defined as 10 p.m. to 7 a.m.) than during the day. While this limitation is impractical for a power plant that is intended to operate day and night, it can be applied to construction activities (see proposed Condition of Certification **NOISE-8** below).

[1] For definitions of these and other noise measurement terms, see **Noise: Appendix A** immediately following this section.

MONTEREY COUNTY NOISE ORDINANCE

Chapter 10.60 of the Monterey County Health and Safety Code is entitled Noise Control (Monterey 1985). Paragraph 10.60.030 restricts the operation of noise-producing devices, requiring that, No person shall operate any machine which produces a noise level exceeding 85 dbA measured fifty feet therefrom . (Ord. 2459/3, 1978.). This limitation can be applied to the operation of the MLPPP.

SETTING

The MLPPP involves the construction and operation of a new 1,060 MW combined cycle power plant on the site of the existing Moss Landing facility. It will be built concurrently with two separate projects not licensed by the Energy Commission; the demolition and removal of 19 fuel oil storage tanks that once fed Moss Landing Units 1 through 7, and a modernization and upgrade of Units 6 and 7.[2] Units 6 and 7, a pair of 750 MW natural gas-fired supercritical steam boiler units built in the 1960s, are to be retrofitted with selective catalytic reduction (SCR) systems to reduce air emissions. Included in this retrofit project is replacement of the existing forced draft fans, installation of new induced draft fans, and replacement of the high-pressure steam turbine rotors, which will increase the generating capacity of each unit by 15˚MW while improving efficiency. The MLPPP and the upgraded Units 6 and 7 will utilize existing water, electrical and natural gas piping and transmission systems (Duke Energy 1999a, AFC//1.1, 1.4.2, 1.4.3, 1.4.4, 1.4.5; Duke Energy 1999h).

The MLPPP will be located within the existing Moss Landing Power Plant site. This facility, zoned for heavy industrial use, lies in an area occupied by industrial facilities, agricultural lands, some light commercial and sparse residential uses, and recreational beaches and tidal wetlands (Duke Energy 1999a, AFC//1.4.2, 1.5.2, 2.0, 2.3.2). Sensitive noise receptors in the vicinity of the project are limited to scattered residences; no hospitals, libraries, schools or churches lie near enough to the site to be affected by noise from the project. The nearest residences are a single home 1,500 feet north of the facility;[3] a single home at Highway 1 and Moss Landing Road south of the facility; a residential neighborhood adjacent to Allen Street, further to the south; boats moored in the harbor immediately west of the Moss Landing facility; and several residences at the Calcagno Dairy Farm, east of the facility.

In order to predict the likely noise effects of the MLPPP on these sensitive receptors, the applicant commissioned an ambient noise survey of the area. This survey was performed by a qualified consultant using typical monitoring and analysis equipment and methods (Duke Energy 1999a, AFC//6.12.1.3; Appendix 6.12-1,/4).

The applicant s noise survey monitored noise levels at the residence to the north, at the Allen Street residential neighborhood, and at the Calcagno Dairy residences for

[2] Units 1 through 5 were permanently retired in January 1995 (Duke Energy 1999a, AFC/2.1).

[3] This residence lies more than 2,000 feet from the site of the MLPPP itself.

a period of 25 continuous hours. Additional short-term measurements were taken during this period at the residence located at Highway 1 and Moss Landing Road, and at the power plant entrance on Dolan Road.

Survey results depict a relatively steady, fairly high level of background noise at the residence to the north, ranging from 53 to 58 dBA, with little variance from day to night. This may be a result of steady noise from the PG&E switchyard, which lies between the residence and the project site, and from the transformers along the north side of the building that houses Units 1 through 5.[4] Background noise level at the Allen Street residential neighborhood varied from 41 to 58 dBA, relatively quiet at night and higher, due to traffic noise, during the morning and evening commute hours. Background noise at the Calcagno Dairy Farm residences ranged from 41 to 55 dBA, with a pattern of loud noises indicating traffic and other activity related to the dairy farm. Spot checks showed that background noise at the residence at Highway 1 and Moss Landing Road exhibited a low of 52˚dBA (Duke Energy 1999a, AFC Table 6.12-4; Figures 6.12-3, 6.12-4, 6.12-5; Appendix 6.12-1).

IMPACTS

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

PROJECT SPECIFIC IMPACTS CONSTRUCTION

COMMUNITY EFFECTS

Construction noise is a temporary phenomenon; the construction period for the MLPPP, along with the associated oil storage tank removal and Units 6 and 7 retrofit, is scheduled to last 29 months (Duke Energy 1999a, AFC∕∕1.4.6, 2.3.3.14). Construction of an industrial facility such as a power plant is typically and unavoidably noisier that permissible under usual noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours is commonly exempted from enforcement by local ordinances.

There are no specific LORS limiting construction noise in Moss Landing. The Monterey County General Plan Noise Element (Monterey 1995) addresses long-term noise sources, but provides some guidance that may be useful for construction noise. Policy 22.2.5, in requiring that noise levels be lower at night than during the daytime, defines night as the period from 10 p.m. to 7 a.m. Staff proposes using this definition for guidance in recommending limits on noisy construction work (see below).

The applicant has predicted the noise impacts of project construction on the nearest sensitive receptors (Duke Energy 1999a, AFC∕6.12.2.1; Table 6.12-8). Noise

[4] Units 1 through 5 provided power at 115 kV and 230 kV to serve local (Monterey, Salinas, Santa Cruz) loads and more distant (Santa Clara Valley) loads. Since the decommissioning of Units 1 through 5, these transformers are used to convert power from the 500 kV switchyard (which receives the output of Units 6 and 7) to 115 kV and 230 kV (Duke Energy 1999a, AFC∕2.1.1.2).

levels at the nearest residence (to the north) are projected to reach 52 to 57 dBA for most work; this compares to the ambient background noise levels here of 53 to 58 dBA. Such an increase in noise level is not obtrusive, and in fact barely noticeable. Noisier work, such as pile driving, is projected to reach 63 dBA at this residence. Such a noise level is noticeable, but will be tolerable to residents due to its temporary nature, and to the fact that the applicant commits to limiting noisy construction work to the daytime hours (Duke Energy 1999a, AFC/6.12.2.1). Construction noise impacts at the other, more distant receptors will be less.

STEAM BLOWS

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

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. High pressure steam is then raised in the heat recovery steam generator (HRSG) or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, is quite effective at cleaning out the steam system. A series of short steam blows, lasting two or three minutes each, is performed several times daily over a period of two or three weeks. At the end of this procedure, the steam line is connected to the steam turbine, which is then ready for operation.

These steam blows can produce noise as loud as 130 dBA at a distance of 100 feet. This would attenuate to about 104 dBA, an exceedingly disturbing level, at the nearest residence, 2,000 feet distant. In order to minimize disturbance from steam blows, the steam blow piping can be equipped with a silencer that will reduce noise levels by 20 to 30 dBA, or to a level of 74 to 84 dBA at the nearest residence. This is still an annoying noise level; staff proposes that any high pressure steam blows be muffled with an appropriate silencer, and be performed only during restricted daytime hours (see proposed Condition of Certification **NOISE-4** below) in order to minimize annoyance to residents.

Alternatively, the applicant may elect to employ a new, quieter steam blow process, variously referred to as QuietBlow™ or Silentsteam™. This method utilizes lower pressure steam over a continuous period of approximately 36 hours. Resulting noise levels reach only about 80 dBA at 100 feet; noise levels at the nearest residence would thus be about 54 dBA, equal to the ambient background noise level and barely noticeable.

Regardless which steam blow process the applicant chooses, staff proposes a notification process (see proposed Condition of Certification **NOISE-5** below) to

make neighbors aware of impending steam blows. This should help ensure the process is at least tolerable to residents.

LINEAR FACILITIES

Construction of the gas line, water lines, and electric interconnection line will produce noise. In a typical greenfield[5] project, with its linear facilities often many miles in length, construction of these facilities can annoy receptors near the routes. In the case of a repowering[6] project such as the MLPPP, however, existing linear facilities can often be used, obviating the need for construction of new ones. Such is the case with MLPPP. The existing natural gas lines, electric switchyards and cooling water supply and return facilities will be employed (Duke Energy 1999a, AFC⁄⁄1.1, 1.2.3, 1.3, 1.4.2, 1.4.4, 1.4.5, 2.1.1.4, 2.2.1, 2.3.3.6, 2.3.3.11, 8.1, 8.3.1.1, 8.5.1.1). Only short connections, located entirely within the Moss Landing Power Plant facility, need be constructed. Construction noise will therefore be similar to that created by construction of the new power plant itself, and thus not likely to annoy neighbors.

WORKER EFFECTS

The applicant does not specifically acknowledge the need to protect construction workers from noise hazards. The applicant does, however, recognize those applicable LORS that will protect construction workers, and commits in general to complying with them (Duke Energy 1999a, AFC⁄⁄1.5.9, 7.5.12 ; Table 7-1). To ensure that construction workers are, in fact, adequately protected, staff has proposed a Condition of Certification (**NOISE-3**, below).

PROJECT SPECIFIC IMPACTS OPERA TION

COMMUNITY EFFECTS

A typical greenfield power plant, as any other new industrial facility, represents an increase in the local noise regime. The usual noise LORS are crafted to limit this increase in noise to levels that are tolerable to any sensitive receptors. A repowering project, on the other hand, holds a potential advantage in that it may be possible, by replacing old facilities with the new plant, to hold noise impacts on the surrounding community to the same level, or even reduce them. Duke Energy s entire Moss Landing modernization project will, in fact, result in a net reduction in noise impacts on its surroundings.[7] The work on Units 6 and 7, which includes installing quieter forced draft fans and installing quiet induced draft fans, will cause those units to operate as much as 13 dBA more quietly than is now the case (Duke Energy 1999a, AFC⁄⁄6.12, 6.12.2.2, 6.12.2.3, 6.12.2.4; Appendix 6.12-1, Table˚9). Adding the new noise from the MLPPP will still result in a net decrease in

---

[5] Greenfield denotes a facility built anew on a previously unused, possibly undisturbed, site.

[6] Repowering is a term used to describe various approaches to modifying or refurbishing an existing power plant, or building a new power plant at an existing power plant facility.

[7] The decommissioning of Units 1 through 5, which occurred in January 1995, before Duke Energy purchased the facility from PG&E (Duke Energy 1999a, AFC⁄2.1), is not included in the modernization project.

noise impacts on the environment (Duke Energy 1999a, AFC/6.12 ; Table 6.12-12).

The original application included the Units 6 and 7 upgrade as part of the MLPPP (Duke Energy 1999a). In subsequent filings, the applicant separated this work from the project (Duke Energy 1999h, 1999i). This simplifies the noise analysis; originally, the MLPPP may have taken credit for some or all of the noise reduction from the work on Units 6 and 7. Since Units 6 and 7 are no longer part of the MLPPP, and are no longer subject to Energy Commission jurisdiction, noise reductions from the Units 6 and 7 retrofit and upgrade cannot be credited to new noise emissions from the MLPPP.

POWER PLANT OPERATION

The MLPPP will be constructed in a heavily industrialized area. It will be entirely surrounded by the existing Moss Landing Power Plant. Adjacent to the south is the National Refractories processing plant, and to the east is an automobile wrecking yard (Duke Energy 1999a, AFC// 1.5.2, 2.3.2, 6.12.1.2).

During its operating life, the MLPPP will represent essentially a steady, continuous noise source day and night. Occasional short-term increases in noise level will occur as steam relief valves open to vent pressure, or during startup or shutdown as the plant transitions to and from steady-state operation. At other times, such as when the plant is shut down for lack of dispatch or for maintenance, noise levels will decrease. While the Monterey County General Plan Noise Element requires that ambient sound levels be less at night (10 p.m. to 7 a.m.) than during the day (Monterey 1995, Policy 22.2.5), this is not practicable in the case of a power plant that may operate round the clock. Instead, Energy Commission staff maintain that controlling plant noise emissions to a level that causes no significant adverse impacts on sensitive receptors at night will ensure compliance with the intent of this LORS.

The MLPPP will be located within the existing Moss Landing Power Plant, at least 1,500 feet from the facility boundary and 2,000 feet from the nearest sensitive receptor. Due to this relative isolation, the applicant s computer modeling shows that the project will cause an increase in background noise levels on the surroundings of only 4 dBA, a barely perceptible amount that conforms to Energy Commission staff s recommended limit of 5 dBA (Duke Energy 1999a, AFC //6.12.2.2; Tables 6.12-10, 6.12-11; Appendix 6.12-1, Tables 6, 8). Additionally, the project will create noise levels less than 85 dBA at 50 feet from the MLPPP site boundary, and noise will not exceed 70 dBA at the Moss Landing Power Plant site boundaries (Duke Energy 1999a, AFC/6.12.2.2; Tables 6.12-9, 6.12-10, 6.12-11; Appendix 6.12-1, Tables 6, 7, 8). The project is thus projected to comply with all applicable LORS governing community noise exposure.

TONAL AND INTERMITTENT NOISES

One possible source of annoyance would be strong tonal noises, individual sounds that, while not louder than permissible levels, stand out in sound quality. The applicant predicts that the only tonals sufficiently loud to cause annoyance would be

lower frequency tones from the gas turbine exhaust. This noise will be controlled by the installation of tuned silencers on the exhaust stacks. Intermittent noises would be caused chiefly by steam relief valves opening as plant load changes or upon a plant trip. To ensure that adequate measures are taken to mitigate tonal and intermittent noise sources, staff has proposed a Condition of Certification (see **NOISE-6**, below) to ensure that tonal noise and intermittent steam relief noises are not allowed to cause a problem.

LINEAR FACILITIES

As discussed above, the project s linear facilities (natural gas, water and electric transmission lines) will all lie within the boundaries of the Moss Landing Power Plant facility. These facilities, once placed in operation, will likely produce no audible noise. The gas and water lines will be silent from any distance. The electric transmission interconnection with the existing PG&E switchyard, on the northern boundary of the facility, will normally be inaudible. A humming from corona effect would occur in rainy or highly humid conditions, but would be practically unnoticeable from within the facility, and completely inaudible from anywhere outside the facility boundary.

WORKER EFFECTS

The applicant recognizes the need to protect plant operating and maintenance personnel from noise hazards, and commits to comply with applicable LORS (Duke Energy 1999a, AFC∥1.5.9, 6.12.2.2, 7.5.12). Areas of the plant with noise levels exceeding 85 dBA (the level below which OSHA does not recognize a threat to workers hearing) will be posted and hearing protection required. Duke Energy will continue the employee health and safety programs currently in use for employees working on Units 6 and 7, programs that have proven successful in the past.

CUMULATIVE IMPACTS

There are several construction projects planned for the region around the Moss Landing facility, including three housing developments, a golf course, and the renovation and expansion of the Moss Landing Marine Lab (Duke Energy 1999a, AFC/6.12.2.3). These projects all lie more than two miles from the MLPPP (the golf course and housing developments), or will be completed before work can begin on the MLPPP (the Marine Lab). The only other projects that could produce cumulative noise impacts are the other elements of Duke Energy s modernization project; the oil storage tank demolition, and the Units 6 and 7 retrofit and upgrade. Construction noise from this work will be of the same nature as that from construction of the MLPPP, and the collective noise levels are not expected to reach significant levels.

As discussed above, the Units 6 and 7 upgrade project will include replacement of four old, noise forced draft fans per unit with two new, quieter forced draft fans and two new, quiet induced draft fans per unit (Duke Energy 1999a, AFC/6.12.2.2). The resultant noise reduction from these units, when combined with the noise produced by the MLPPP, will result in a net decrease in noise to the surroundings. The net cumulative impact, then, will be beneficial rather than adverse.

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 MLPPP, it can be treated similarly. That is, noisy work can be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise LORS then in existence would apply; applicable Conditions of Certification included in the Energy Commission Decision would also apply unless properly modified.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that the MLPPP will likely be built and operated to comply with all applicable noise laws, ordinances, regulations and standards. Staff further concludes that the MLPPP, mitigated as described above, will likely present no significant adverse noise impacts. In fact, the applicant s concurrent Moss Landing modernization project will likely result in a cumulative noise impact that is beneficial rather than adverse. The MLPPP will likely represent an unobtrusive, nearly undetectable component of ambient noise levels.

RECOMMENDATIONS

Staff recommends that the following proposed Conditions of Certification be adopted to ensure compliance with all applicable noise LORS, and implementation of the applicant s proposed mitigation measures.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 At least 15 days prior to the start of rough grading, the project owner shll notify all residents within one-half mile of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: The project owner shall transmit to the Energy Commission Compliance Project Manager (CPM) in the first Monthly Construction Report following the start of rough grading a statement, signed by the project manager, attesting that the above notification has been performed, and describing the method

of that notification. This statement shall also attest that the telephone number has been established and posted at the site.

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

Protocol: The project owner or authorized agent shall:

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

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

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

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

NOISE-4 If a traditional, high-pressure steam blow process is employed, the project owner shall equip steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 110 dBA measured at a distance of 100 feet. The project owner shall conduct steam blows only during the hours of 8 a.m. to 5 p.m. If a low-pressure continuous steam blow process is employed, the project owner shall submit a description of this process, with expected noise levels and projected hours of execution, to the CPM.

Verification: At least 15 days prior to the first high-pressure steam blow, the project owner shall submit to the CPM drawings or other information describing the temporary steam blow silencer and the noise levels expected, and a description of the steam blow schedule. At least 15 days prior to any low-pressure continuous steam blow, the project owner shall submit to the CPM drawings or other information describing the process, including the noise levels expected and the projected time schedule for execution of the process.

NOISE-5 At least 15 days prior to the first steam blow(s), the project owner shall notify all residents within one-half mile of the site of the planned steam blow activity, and shall make the notification available to other area residents in an appropriate manner. The notification may be in the form of letters to the area residences, telephone calls, fliers or other effective means. The notification shall include a description of the purpose and nature of the steam blow(s), the proposed schedule, the expected sound levels, and the explanation that it is a one-time operation and not a part of normal plant operations.

Verification: Within five (5) days of notifying these entities, the project owner shall send a letter to the CPM confirming that they have been notified of the planned steam blow activities, including a description of the method(s) of that notification.

NOISE-6 Within 30 days of the project first achieving 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. Steam relief valves shall be adequately muffled to preclude noise that draws complaints. If the results from the survey indicate that the project noise levels are in excess of 70 dBA in front of the new units, additional mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

Verification: Within 30 days after completing the survey, the project owner shall submit a summary report of the survey to the Monterey County Department of Health, Division of Environmental Health, and to the CPM. Included in the report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. Within 30 days of completion of installation of these measures, the project owner shall submit to the CPM a

summary report of a new noise survey, performed as described above and showing compliance with this condition.

NOISE-7 The project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted within 30 days after the facility is in full operation, and shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5099 (Article 105) and Title 29, Code of Federal Regulations, section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

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

NOISE-8 Noisy construction work (that which causes offsite annoyance, as evidenced by the filing of a legitimate noise complaint) shall be restricted to the times of day delineated below:

High-pressure steam blows:	8 a.m. to 5 p.m.
Other noisy work	7 a.m. to 10 p.m.

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

NOISE COMPLAINT RESOLUTION FORM

Moss Landing Power Plant Project
(99-AFC-4)

NOISE COMPLAINT LOG NUMBER _____

Complainant's name and address:

Phone number: _____

Date complaint received: _____
Time complaint received: _____

Nature of noise complaint:

Definition of problem after investigation by plant personnel:

Date complainant first contacted: _____

Initial noise levels at 3 feet from noise source _____ dBA Date: _____
Initial noise levels at complainant's property: _____ dBA Date: _____

Final noise levels at 3 feet from noise source: _____ dBA Date: _____
Final noise levels at complainant's property: _____ dBA Date: _____

Description of corrective measures taken:

Complainant's signature: _____ Date: _____

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

This information is certified to be correct:

Plant Manager's Signature: _____

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

REFERENCES

Barnes, J.D., L.N. Miller, and E.W. Wood. 1976. Prediction of Noise from Power Plant Construction. Bolt Beranek and Newman, Inc., Cambridge, Massachusetts. Prepared for Empire State Electric Energy Research Corporation, Schenectady, New York.

Cunniff, Patrick F., *Environmental Noise Pollution*. John Wiley & Sons, 1992.

DHS (California Department of Health Services), Office of Noise Control. *Model Community Noise Control Ordinances*, 1977.

Driscoll, D.A. 1985. NoiseCALC (A Computer Model for Noise Level Prediction), State of New York Department of Public Service, New York.

Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.

Duke Energy. 1999h. Letter describing changes to Moss Landing Power Plant Project i.e., upgrade change to existing Units 6 & 7, submitted to the California Energy Commission, September 7, 1999.

Duke Energy. 1999i. Duke Energy supplemental to the AFC detailing upgrade changes to Units 6 & 7. Submitted to the California Energy Commission, November 22, 1999.

Edison Electric Institute. *Electric Power Plant Environmental Noise Guide*, 1984.

Kryter, Karl D. *The Effects of Noise on Man*. Academic Press, N.Y., 1970.

Miller, L.N., E.W. Wood, RM. Hoover, A.R. Thompson, and S.L. Paterson. 1978. Electric Power Plant Environmental Noise Guide, Volume 1. Bolt Beranek and Newman, Inc., Cambridge, Massachusetts. Prepared for Edison Electric Institute, New York, New York.

Monterey. 1985. Monterey County Health and Safety Code, Chapter 10.60: Noise Control. Updated October 1985.

Monterey. 1995. Monterey County General Plan, Chapter 2: Environmental Constraints; Noise Hazards. Updated 1995.

Peterson and Gross (Peterson, Arnold P. G. and Ervin E. Gross, Jr.). *Handbook of Noise Measurement*, 7th ed. GenRad, Concord, MA., 1974.

Suter, Alice H., "Noise Sources and Effects: A New Look." Sound and Vibration, January 1992.

Thumann, Albert and Richard K. Miller, Fundamentals of Noise Control Engineering. Prentice-Hall, 1986.

U.S. EPA. 1971. *Noise from Construction Equipment and Operations*. Prepared by Bolt et al. Beranek, and Newman, Boston, MA.

U.S. EPA. 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. 550/9-74-004. U.S. Environmental Protection Agency, Office of Noise Abatement and Control. Washington, DC.

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.

Except under special conditions, a change in sound level of one dB cannot be perceived.

Outside of the laboratory, a 3-dB change is considered a barely noticeable difference.

A change in level of at least five dB is required before any noticeable change in community response would be expected.

A 10-dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response.

COMBINATION OF SOUND LEVELS

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

NOISE: Table A3
Addition of Decibel Values

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

Source: Thumann, Table 2.3

SOUND AND DISTANCE

- Doubling the distance from a noise source reduces the sound pressure level by 6 dB.

- Increasing the distance from a noise source ten times reduces the sound pressure level by 20 dB.

WORKER PROTECTION

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

NOISE: Table A4
OSHA Worker Noise Exposure Standards

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

Source: OSHA Regulation

VISUAL RESOURCES

David Flores

INTRODUCTION

Energy Commission staff analyzed both the potential visual impacts of the proposed Moss Landing Power Project (MLPP) and the compliance of the project with applicable laws, ordinances, regulations, and standards. Staff concludes that the project with mitigation measures in place will not cause significant adverse visual impacts in the areas identified in this analysis. Significant adverse visual impact will be mitigated to less than significant levels by implementation of mitigation measures (light reflectors, landscape screening, and color treatment at the power plant) 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 are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether the MLPP 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.

This analysis is organized as follows:

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

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

criteria used for visual assessment, and identification of the basis for identifying relevant significance criteria used in evaluating the impacts of the proposed project.

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

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

Appendix G of the Guidelines, under Aesthetics, 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; or

d) create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

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

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?

EVALUATION PROCESS

Energy Commission staff and the applicant s consultant selected eleven Key Observation Points[2](KOPs) 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.

ELEMENTS OF THE VISUAL SETTING

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

Visual Quality — This is the value of visual resources. This analysis used an approach that considers visual quality as ranging from outstanding to low. Outstanding visual quality is a rating reserved for landscapes that would be what a viewer might think of as picture postcard landscapes. Low visual quality describes landscapes that are often dominated by visually discordant human alterations, and do not provide views that people would find inviting or interesting (Buhyoff et al., 1994). 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 — This is a measurement of the level of interest or concern of viewers regarding the visual resources in an area. Official statements of public values and 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 above-ground 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. The closer the feature is to the center of the view area, the greater its visibility.

[2] The use of KOPs or similar view locations is common in visual resource analysis. The US Bureau of Land Management and the US Forest Service use such an approach.

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 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 negligible to dominant or co-dominant.

Contrast — Visual contrast was evaluated in regard to the elements of color, form, line, and scale.[3] The degree of contrast can range from high to low.

View Blockage — View blockage is the blockage from view 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 tie into the existing electrical grid system, is located on property owned by the applicant, therefore is not subject to federal land management requirements. The project site is on a section of Highway 1 designated as a potential scenic highway, and near Elkhorn Slough, which is designated as a potential scenic waterway in the North County Land Use Plan. Without official designation, no federal or state regulations pertaining to scenic resources for the Elkhorn Slough or Highway 1 are applicable to the project, although the North County Land Use Plan establishes criteria to protect the visual resources in this area, and are listed below under local general plan policies.

LOCAL

Monterey County has specific policies on visual or aesthetic resources that apply to the Moss Landing project. These issues are addressed in the Monterey County Coastal Implementation Plan, Part 1 & 2, and North County Land Use Plan, Local Coastal Program, implemented by the Monterey County Planning Department. The

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

Local Plan provides policies for protection of shoreline view and locations of new structures on the least visually obtrusive portion of a parcel.

Monterey County Coastal Implementation Plan Part I (Title 20, Zoning Ordinance) Chapter 20.28: Regulations for Heavy Industrial Zoning Districts (HI/CZ)

Section 20.28.070.D: All development shall have landscaping covering a minimum of 10 percent of the site area subject to a plan approved by the Director of Planning. The landscaping shall be in place prior to commencement of use.

Section 20.28.070.E: All exterior lighting shall be unobtrusive, harmonious with the local area, and constructed or located so that only the area intended is illuminated and off-site glare is fully controlled.

Section 20.28.080.A: All equipment and material storage areas shall be screened by solid wall, fences, or by adequate plantings of not less than 6 feet in height.

The Monterey County Coastal Implementation Plan, Part 2: Visual Resources Development Standards include a requirement for onsite inspection by a planner for industrial uses, to determine conformance with policies of the land use and development standards of the Implementation Plan.

The following guidelines specific to visual resources have been developed to protect scenic corridors:

- The location and siting of structures shall allow for their maximum screening from public view by topography or vegetation and to minimize obstructions of or intrusion of views of the shoreline from public viewing areas.
- The design of structures, including fencing shall incorporate natural materials, earth-tone colors, and otherwise blend with the rural setting.
- Landscaping and lighting shall be unobtrusive and blend with the rural setting. Landscaping shall incorporate native plants common to the area.
- The structures shall be modified for bulk, size, and height where necessary to protect and minimize visibility from the public viewshed.

PROJECT DESCRIPTION

The proposed MLPP involves installation of two, 530-megawatt (MW), natural gas-fired combined cycle units, plus the installation of four exhaust stacks, each 145 feet in height. The project also includes removal of eight existing 225-foot stacks formerly used for units 1 through 5 (retired from service by PG&E in 1995). The project will not require installation of new high-voltage transmission lines, as power from the combined-cycle units will tie into the existing PG&E 230-kV

switchyard located immediately north of the power plant, where units 1 through 5 previously connected into the PG&E grid.

SETTING

REGIONAL SETTING

The project is located within the North County region of Monterey County. The site is approximately 12 miles northwest of Salinas, California in Monterey County near the Moss Landing Harbor. The area in which the plant is located includes industrial facilities, agricultural lands, sparse residences, recreational beaches and tidal wetlands.

The project site is bordered on the west by Highway 1 and Moss Landing Harbor, and on the south by Dolan Road, National Refractories and Moro Cojo Slough, and Elkhorn Slough is to the north.

The area in the vicinity of the MLPP is used primarily for agriculture, open space wildlife habitat, industry and marine-related uses. The most prominent land use in the vicinity is agriculture, including cattle grazing and cropland. Open space wildlife habitat occurs in the areas of the Elkhorn Slough to the north (including the Elkhorn Slough National Estuarine Reserve) and Moro Cojo Slough to the south.

Communities in the project area include Moss Landing, Castroville, and Oak Hills, which are small-unincorporated townships, located along Highways 1 and 58.

The Elkhorn Slough National Estuarine Research Reserve (Reserve) is located four miles east of the MLPP and is managed by the California Department of Fish and Game in cooperation with the National Oceanic and Atmospheric Administration. The 1,400-acre reserve has miles of trails, an interpretative center, and channels for canoeing and float boats for bird and wildlife viewing excursions.

The proposed power plant will be visible from the Reserve; therefore staff has addressed the Reserve in the visual analysis and impact section of this report.

PROJECT AREA SETTING

The project site will be located on a 239-acre parcel located at the intersection of Dolan Road and Highway 1. The plant is situated near the Moss Landing Harbor in an area, which includes industrial facilities, agricultural lands, sparse residences, recreational beaches, and tidal wetlands. Much of the land has been graded; some of the graded areas have been paved, but much of the graded areas have been left with either dirt or gravel surfaces. The only vegetation consists of low-growing annual grasses within the plant site and extensive landscape cover surrounding the perimeter of the property. In addition at the

MLPP, the phased removal of fuel storage tanks will be completed under a County demolition permit. This action will considerably reduce the portion of the horizontal field of view occupied by existing industrial facilities.

KEY OBSERVATION POINTS

As provided in the AFC (AFC pg.6.13-20, Section 6.13.2.7), the consultant structured the analysis of the project effects by identifying the view areas most sensitive to the project s potential visual impacts. In consultation with Energy Commission staff, eleven 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. The description of the view from each KOP is located in the OPERATIONS IMPACTS section of the report.

ANALYSIS AND IMPACTS

CONSTRUCTION IMPACTS

Construction for the project site is expected to take about 29 months and would entail the use of heavy construction equipment, the development of a laydown, storage area, and truck traffic. The power plant site is sufficiently far from residences that visual impacts due to construction would not be significant.

The project will not require installation of new high-voltage transmission lines. Instead, power from the combined-cycle units will tie into the existing PG&E 230-kV switchyard located immediately north of the power plant, where Units 1 through 5 of the existing plant connected to the PG&E grid.

Natural gas will be provided by two existing gas distribution lines (20 and 24 inches in diameter) that convey natural gas from the PG&E pressure limiting and regulator station in Hollister, California. Short segments of natural gas distribution lines will be extended to the project. No visual impacts will arise, as any new gas lines constructed will be underground.

The project will utilize three water systems, which are currently in place. Therefore no visual impacts will occur.

Wastewater from the proposed plant will use the existing discharge structure currently used for Units 6 and 7, therefore no visual impacts will occur.

VISUAL RESOURCES Figure 1
Key Observation Points

OPERATIONS IMPACTS

Eleven Key Observation Points were selected to be representative of the most critical locations from which the project will be seen. KOP s are often located in an effort to evaluate impacts on visual resources with various levels of sensitivity, in different landscape types and terrain, and from various vantage points. The following KOP locations include (1) along major or significant travel corridors; (2) at key vista points; (3) in proximity to residential uses; and (4) at significant recreational areas.

KEY OBSERVATION POINT 1-VIEW FROM RESIDENTIAL EDGE OF CASTROVILLE

KOP 1(see **VISUAL RESOURCES Figure 2** for location) represents the northwest view from the western residential edge of the community of Castroville. The KOP is located approximately 13,300 feet (2.5 miles) from the proposed new stacks of the MLPP.

Visual Sensitivity

Because of the residences in the area of KOP 1, viewer sensitivity is high.

Visibility

Because of the distance between KOP 1 and the power plant (approximately 2.5 miles), the power plant, including the stacks, will be barely visible, therefore visibility from KOP 1 will be low.

Visual Quality

The view of KOP 1 has the character of an open landscape, predominantly flat, and devoted to agricultural activities. Greenhouses to the right block views to the proposed power plant site for many of the residents. Considering these factors, visual quality is moderate to high.

Viewer Exposure

Approximately 24,500 vehicles per day travel on Highway 156. For travelers on Highway 156, considering the horizon distance and moderate duration of view, viewer exposure is low. The number of residences in the area of Castroville represented by this view (791) is moderate and view duration is high, so viewer exposure is low to moderate.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures in regard to form, line, and scale. Scale contrast with existing residences would be low because the power plant would be farther from the view area than the existing homes. The proposed earth tones of the power plant and stacks would contrast moderately with the gray tones of the existing industrial landscape. Contrast with existing residences in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 1 toward the site consist of agricultural land with a small number of trees and green houses in the middle ground. The portions of the project visible from this view are predominantly vertical, while the trees are rounded and the green houses appear as a horizontal band, so the project would cause high contrast with vegetation in regard to form and line. The proposed earth tones of the power plant stacks would contrast moderately with the green tones of the trees and agricultural fields. Because of the distance of the project from KOP 1, the increment of contrast with vegetation added by the proposed structures would be small, and contrast with vegetation would be low.

Contrast with Land/Water

From KOP 1, the landform is almost flat and forms a horizontal band. No water is visible in this view. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. Vegetated land surface is visible, so color would be moderate. The project size would appear approximately the same size as the existing Moss Landing Plant, so scale contrast would be low.

Because of the distance of the project from KOP 1, the increment of contrast with land added by the proposed structures would be small, and contrast with land would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 1 would be negligible.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 1 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be 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 1, the project would block a small part of the view of the sky. Existing industrial structures already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be negligible.

Visual Impact

It can be concluded that the proposed power plant and stacks will not have a significant impact based on the following summary of visual factors for KOP 1:

- viewer sensitivity is high;

- visual quality is moderate to high ;
- visibility is low;
- viewer exposure is low to moderate;
- the highest levels of contrast would be low.
- scale dominance would be negligible.
- spatial dominance would be co-dominant; and
- view blockage would be negligible.

KEY OBSERVATION POINT 2- VIEW FROM THE BEACH AT PAJARO DUNES

KOP 2 (see **VISUAL RESOURCES Figure 3** for location) represents the view of the proposed power plant from Pajaro Dunes four miles north from MLPP.

Visual Sensitivity

Because the viewers for KOP 2 are primarily the occasional beachcombers, visual sensitivity is considered high.

Visibility

KOP 2 is located on the beach at Pajaro Dunes, with a southeastern view of the power plant with the Pajaro River in the foreground. The proposed power plant stacks will barely be discernable and are slightly taller than the distant trees on the horizon, so visibility from KOP 2 is considered low.

Visual Quality

The view from KOP 2 includes the panoramic view of the beach, dunes, Pajaro River in the foreground, native vegetation along the coastal beach, and trees in the background. Therefore visual quality is considered high.

Viewer Exposure

As provided in the AFC, approximately 565 vacation homes are situated in this area with 10% or 56 of the Pajaro Dunes being occupied year round. The number of residences represented by this view is moderate, the distance is background, and the view duration is long, so viewer exposure is moderate.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures to the east of the project in regard to form, line, and scale. Scale contrast with existing industrial structures in the distance would be low because the power plant would be obscured from the view from existing trees and vegetation along the horizon. Contrast with existing structures in regard to form and line would be low. The proposed earth tone color proposed for the power plant would contrast moderately with the colors of the existing vegetation in the background.

Contrast with Vegetation

Vegetation visible in the view from KOP 2 toward the site consists of Pajaro Dunes with vegetation and a small number of trees in the distance. The portions of the project visible from this view are predominantly vertical, while the trees are rounded and appear as a horizontal band, so the project would cause high contrast with vegetation in regard to form and line. The proposed earth tones of the power plant stacks would cause a low level of contrast with the sparse vegetation which is generally salt brush. Because of the distance of the project from KOP 2, the increment of contrast with vegetation added by the proposed structures would be small, and contrast with vegetation would be low.

Contrast with Land/Water

From KOP 2, the landform is almost flat and forms a horizontal band. Water is visible in this foreground view of Pajaro River. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. The proposed earth tone of the proposed project would contrast moderately with the color of the water. Because of the distance of the project from KOP 2, the project size would appear smaller than the coastal hills and the large expanse of water, so scale contrast would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 2 would be negligible .

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 2 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be backdropped be sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

VIEW BLOCKAGE

From KOP 2, the project would block a small part of the view of the sky. Existing trees already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be negligible.

Visual Impact

It can be concluded that the proposed power plant and stacks will not have a significant impact based on the following summary of visual factors for KOP 2:

- viewer sensitivity is high;
- visual quality in this area is high;
- visibility is low;

- viewer exposure is moderate;
- the highest levels of contrast would be low;
- scale dominance would be negligible.
- spatial dominance would be co-dominant.; and
- view blockage would be negligible.

KEY OBSERVATION POINT 3- SOUTHWEST VIEW FROM STRUVE ROAD NEAR HIGHWAY 1

KOP 3 (see **VISUAL RESOURCES Figure 4** for location) represents the southwest view of a portion of the proposed power plant viewed from Struve Road near Highway 1. The viewpoint is approximately 2.5 miles from MLPP.

Viewer Sensitivity

The viewers consist of travelers in cars, most which access the beach from Struve Road, and approximately 680 local residents. Overall, visual sensitivity is considered high.

Visibility

The proposed power plant stacks would be slightly visible from this viewpoint for the residents and the travelers. Approximately 680 individuals live within the vicinity of KOP 3 with several obstructed views (trees in the middleground and background) towards the proposed plant site. In addition, because the plant is situated along the coast, fog and haze would frequently obscure the visual perception of the plant. Therefore visibility is considered low.

Visual Quality

The view from KOP 3 encompasses agricultural fields with sporadic trees in the middle ground and background. The view is panoramic and the power plant and stacks would be partially screened by the trees in the middleground and background views. Therefore visual quality is rated moderate.

Visual Exposure

Based on the number of residents and travelers to the state beach (approximately 100 per day), long duration of view and background distance of the KOP, viewer exposure is moderate.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures to the east of the project in regard to form, line, and scale. Scale contrast with existing industrial structures in the distance would be low because the power plant would be obscured from the view by existing trees and vegetation along the horizon. The proposed earth tone color proposed for the power plant would contrast moderately with the colors of the existing structures. Contrast with existing structures in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 3 toward the project site consists of agricultural row crops with a small number of trees in the middleground and on the horizon. The portions of the project visible from this view are predominantly vertical, while the trees are rounded and appear as a horizontal band, so the project would cause high contrast with vegetation in regard to form and line. The proposed earth tones of the power plant stacks would cause a moderate level of contrast with the green color tones of the agricultural fields. Because of the distance of the project from KOP 3, the increment of contrast with vegetation added by the proposed structures would be small, and contrast with vegetation would be low.

Contrast with Land/Water

From KOP 3, the landform is flat and forms a horizontal band. There is no water visible in this view. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. The project size would appear approximately the same size as the existing trees in the horizon, so scale contrast would be low.

Because of the distance of the project from KOP 3, the increment of contrast with land added by the proposed structures would be small, and contrast with land would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 3 would be negligible .

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 3 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be backdropped be 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 project would block a small part of the view of the sky. Existing trees already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be negligible.

Visual Impact

It can be concluded that the proposed power plant and stacks will not have a significant impact based on the following summarization of visual factors for KOP 3:

- viewer sensitivity is high;
- visual quality in this area is moderate;
- visibility is low;
- viewer exposure is moderate;
- the highest levels of contrast would be low;
- scale dominance would be negligible;
- spatial dominance would be co-dominant; and
- view blockage would be negligible.

KEY OBSERVATION POINT 4- WEST VIEW FROM ELKHORN OBSERVATION POINT

KOP 4 (see **VISUAL RESOURCES Figure 5** for location) represents the western view from Elkhorn Slough Observation Point near the visitor s center. As described in the AFC, the center is at the nearest edge of the rolling coastal hills, where the elevation and angle provide a direct view of Elkhorn Slough and MLPP. The viewpoint is approximately three miles from MLPP.

Visual Sensitivity

Because the viewers from this KOP will predominantly be tourist and local wildlife and natural area enthusiast, visual sensitivity is considered high.

Visibility

Visibility from the KOP is considered low to moderate based on the trees in the horizon that will screen a major portion of the project from view. The occurrence of fog and haze will also provide a camouflaging effect to the proposed plant.

Visual Quality

The view from KOP 4 is panoramic across Elkhorn Slough and the habitat areas. The terrain in this area is flat to slightly rolling. The vegetation is low grasses and shrubs, and the trees along the north side of the power plant site. An existing electrical transmission line is in the middleground. The proposed power plant appears small on the horizon. Considering these factors, visual quality is moderate to high for KOP 4.

Visual Exposure

The proposed power plant will be visible to approximately 125 visitors on per day, at the visitor s center. Considering the distance from the KOP to the proposed power plant, the moderate number of viewers, and the moderate duration of view, visual exposure for KOP 4 is low to moderate.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures to the west of the project in regard to form, line, and scale. Scale contrast with existing industrial structures in the distance would be low because the power plant would be obscured from the view from existing tanks and vegetation along the horizon. Contrast with existing structures in regard to

form and line would be low. The proposed earth tone color proposed for the power plant would contrast moderately with the colors of the existing structures.

Contrast with Vegetation

Vegetation visible in the view from KOP 4 toward the project site consist of habitat areas with a small number of trees in the foreground and in the horizon. The portions of the project visible from this view are predominantly vertical, while the trees are rounded and appear as a horizontal band, so the project would cause high contrast with vegetation in regard to form and line. The proposed earth tones of the power plant stacks would cause a moderate level of contrast with the green and tan color tones of the habitat area. Because of the distance of the project from KOP 4, the increment of contrast with vegetation added by the proposed structures would be small, and contrast with existing vegetation would be low.

Contrast with Land/Water

From KOP 4, the foreground and middleground is composed of water from Elkhorn Slough and rolling coastal hills. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. The proposed earth tone of the project would contrast moderately with the color of the rolling hills and vegetation. The project size would appear approximately the same size as the existing trees in the horizon, so scale contrast would be low.

Because of the distance of the project from KOP 4, the increment of contrast with land added by the proposed structures would be small, and contrast with existing land would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 4 would be negligible.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 4 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be backdropped be sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

VIEW BLOCKAGE

From KOP 4, the project would block a small part of the view of the sky. Existing trees already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be low.

Visual Impact

It can be concluded that the proposed power plant and stacks will not have a significant impact based on the following summarization of visual factors for KOP 4:

- viewer sensitivity is high;
- visual quality in this area is moderate to high;
- visibility is low to moderate;
- viewer exposure is low to moderate;
- the highest levels of contrast would be low;
- scale dominance would be negligible;
- spatial dominance would be co-dominant; and
- view blockage would be low.

KEY OBSERVATION POINT 5- NORTHEAST VIEW FROM SALINAS RIVER STATE BEACH PARKING AREA

KOP 5 (see **VISUAL RESOURCES Figure 6** for location) represents the northeast view of the proposed plant site from the Salinas State Beach parking area. The ocean dunes are to the left of the photo with the Salinas River in the foreground. On the hill is the new Moss Landing Marine Laboratory currently under construction, and the Moss Landing harbor is in front of the existing power plant.

Visual Sensitivity

Because the viewers from this KOP consist primarily tourist and local nature enthusiasts, visual sensitivity is considered high.

Visibility

Because the view of the proposed plant site is mostly obscured by the industrial landscape of National Refractories, visibility is considered low to moderate.

Visual Quality

The view from KOP 5 takes in the now under construction Moss Landing Marine Laboratory, the National Refractory industrial site, and the existing power plant. Because of the presence of pre-existing commercial and industrial infrastructures, visual quality is considered low.

Visual Exposure

On average, approximately 178 visitors arrive at the state beach with an estimated 800 vehicles during peak days. Visitor counts to the State Park are estimated at approximately 64,000 per year. For visitors, the number of viewers is moderate and the view duration is moderate. Considering these factors, viewer exposure is moderate for KOP 5.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures to the foreground and middleground in regard to form, line,

and scale. The earth tone color proposed for the power plant would constrast mmoderately with the colors of the existing structures. Scale contrast with existing industrial structures in the distance would be low because the power plant would be obscured from the view from the existing power plant and the industrial landscape of the area. Contrast with existing structures in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 5 toward the project site consists of natural grasses and coastal rolling hills with a small number of trees in the foreground and in the horizon. The portions of the project visible from this view are predominantly vertical, while the trees are rounded and appear as a horizontal band, so the project would cause high contrast with vegetation in regard to form and line. In addition, the proposed earth tones of the power plant stacks would cause a moderate level of contrast with the green and tan color tones of the rolling hill s terrain. Because of the distance of the project from KOP 5, the increment of contrast with vegetation added by the proposed structures would be small, and contrast with existing vegetation would be low.

Contrast with Land/Water

From KOP 5, the landforms are flat with some coastal rolling hills. No water is visible in this view. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. However, because the project structures would appear similar in size to the existing industrial landscape, scale contrast would be negligible.

Because of the distance of the project from KOP 5, the increment of contrast with land added by the proposed structures would be small, and contrast with existing land would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures and industrial landscape, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 5 would be negligible.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 5 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be 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 5, the project would block a small part of the view of the sky. The existing industrial landscape already block more of the view than the project

would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be low.

Visual Impact

It can be concluded that the proposed power plant from this KOP will not have a significant impact based on the following summary of visual factors for KOP 5:

- visual sensitivity is high;
- visual quality is low;
- visibility is low to moderate;
- viewer exposure is moderate;
- the highest levels of contrast would be low;
- scale dominance would be negligible;
- spatial dominance would be co-dominant ; and
- view blockage would be negligible.

KEY OBSERVATION POINT 6- NORTHWEST VIEW FROM INTERSECTION OF SANDHOLDT ROAD AND HIGHWAY 1

KOP 6 (see **VISUAL RESOURCES Figure 7** for location) represents the view toward the north of the proposed plant site from the intersection of Sandholdt Road and Highway 1. Highway 1 turns directly toward the power plant with a rural store, residential area and cemetery to the left of KOP 6 being the features of visual interest within the vicinity.

Visual Sensitivity

Because the viewers from this KOP are primarily travelers on Highway 1 composed of tourists and local workers, visual sensitivity is considered moderate to high.

Visibility

Because the view of the proposed plant site is partially obscured by the industrial landscape of National Refractories and the existing power plant, visibility is considered low to moderate.

Visual Quality

The view from KOP 6 to the north takes in the National Refractory industrial site and the existing power plant. Because of the presence of pre-existing commercial and industrial infrastructures, visual quality is considered low.

Visual Exposure

This KOP represents approximately 73 residential homes, and on average approximately 200 visitors arrive at the Salinas River State Beach with an estimated 800 vehicles during peak days. In addition, approximately 24,500 vehicles per day travel north and south on Highway 1. Considering view duration is moderate for visitors, the middleground distance of the proposed power plant

and obstructed view from pre-existing industrial uses, viewer exposure is low to moderate. For residences, the number of viewers is moderate and the view duration is long, so viewer exposure is moderate to high.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures in the middleground in regard to form, line, and scale. Scale contrast with existing industrial structures in the distance would be low because the power plant would be smaller than the existing power plant and the National Refractories facility. Contrast with existing structures in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 6 toward the project site consist of agricultural fields with a small number of trees in the foreground and in the horizon. The portions of the project visible from this view are predominantly vertical, while the trees are rounded and appear as a horizontal band, so the project would cause high contrast with vegetation in regard to form and line. The proposed earth tones of the power plant stacks would cause a moderate level of contrast with the green and tan color tones of the agricultural fields and surrounding fallow lands. Because of the distance of the project from KOP 6, the increment of contrast with vegetation added by the proposed structures would be small, and contrast with existing vegetation would be low.

Contrast with Land/Water

From KOP 6, the landforms are flat and forms a horizontal band. No water is visible in this view. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. The proposed earth tone of the project would contrast moderately with the color of the existing landforms that are generally green and tan in nature. Because the project structures would appear similar in size to the existing industrial landscape, scale contrast would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures and industrial landscape, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 6 would be negligible.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 6 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be backdropped be sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

VIEW BLOCKAGE

From KOP 6, the project would block a small part of the view of the sky. The existing industrial landscape already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be low.

Visual Impact

It can be concluded that the proposed power plant from this KOP will not have a significant impact based on the following summarization of visual factors for KOP 6:

- visual sensitivity is moderate to high;
- visual quality is low;
- visibility is low to moderate;
- viewer exposure is low to moderate for visitors and moderate to high for residences;
- the highest levels of contrast would be low;
- scale dominance would be negligible;
- spatial dominance would be co-dominant ; and
- view blockage would be low.

KEY OBSERVATION POINT 7- NORTHWEST VIEW FROM DOLAN ROAD WITH TANKS IN FOREGROUND

KOP 7 (see **VISUAL RESOURCES Figure 8** for location) represents the northwest view of the proposed plant site from Dolan Road with the oil storage tanks in the middle ground. Although the applicant has indicated their intent to remove the existing storage tanks, this proposal is under a separate action with the County, and the visual effect is not considered in this evaluation. The rail spur is to the left of the photo, paralleled by Dolan Road.

Visual Sensitivity

Because the viewers from this KOP are primarily local residents and travelers to Elkhorn Slough, visual sensitivity is considered high.

Visibility

From viewers on Dolan Road, the existing oil storage tanks and trees obscure the view of the proposed power plant with the exception of the upper portion of the stacks, therefore visibility low to moderate.

Visual Quality

The view from KOP 7 takes in the view of the existing power plant, abandoned oil tanks and electrical transmission lines in the middleground. With the removal of the eight, 225-foot tall stacks, a visual benefit will result, although the new stacks will appear to be in the same location as the old stacks. Because of the presence of pre-existing industrial infrastructure, visual quality is considered low.

Visual Exposure

On average, approximately 125 visitors drive along Dolan Road to the Elkhorn Slough habitat area per day. Approximately 1,785 daily vehicle trips occur along Dolan Road. For travelers, the number of viewers is moderate and view duration is short. Considering these factors, viewer exposure is low to moderate for KOP 7.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures in the middleground in regard to form, line, and scale. Scale contrast with existing industrial structures would be low because the power plant would be smaller the existing power plant. The proposed earth tone color of the power plant would contrast moderately with the gray tones of the existing industrial landscape. Contrast with existing structures in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 7 toward the project site consist of grazing lands with a small number of trees in the middleground and in the background. The portions of the project visible from this view are predominantly vertical, while the trees are rounded and appear as a horizontal band, so the project would cause high contrast with vegetation in regard to form and line. The proposed earth tones of the power plant stacks would cause a moderate level of contrast with the tan color tones of the grazing lands. Because of the distance of the project from KOP 7, the increment of contrast with vegetation added by the proposed structures would be small, and contrast with existing vegetation would be low.

Contrast with Land/Water

From KOP 7, the landforms are flat and forms a horizontal band. No water is visible in this view. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. However, because the project structures would appear similar in size to the existing industrial landscape, scale contrast would be low. The proposed earth tone of the project would contrast moderately with the color of the existing landforms, so scale contrast would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures and industrial landscape, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 7 would be low.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 7 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be backdropped be sky, spatial dominance in regard to

backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

VIEW BLOCKAGE

From KOP 7, the project would block a small part of the view of the sky. The existing industrial landscape already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be low.

Visual Impact

It can be concluded that the proposed power plant from this KOP will not have a significant impact based on the following summary of visual factors for KOP 7:

- visual sensitivity is high;
- visual quality is low;
- visibility is low to moderate;
- viewer exposure is low to moderate;
- the highest levels of contrast would be low;
- scale dominance would be low;
- spatial dominance would be co-dominant; and
- view blockage would be low.

KEY OBSERVATION POINT 8- SOUTHEAST VIEW FROM HIGHWAY 1 NEAR BRIDGE OVER ELKHORN SLOUGH

KOP 8 (see **VISUAL RESOURCES Figure 9** for location) represents the southeast view from Highway 1 near the bridge over Elkhorn Slough. Large vegetative screening buffers the visual impact of the power plant from the highway.

Transmission towers are visible to the left, and the Salinas River and the harbor are to the right. Highway 1 is the largest element of the view as it heads directly toward the power plant.

Viewer Sensitivity

Because the viewers from this KOP are primarily tourists on Highway 1 as well as local workers, visual sensitivity is considered moderate to high.

Visibility

The view of the proposed plant site is obscured by the vegetative landscape adjacent to MLPP s property line, so visibility is low.

Visual Quality

The view from KOP 8 along Highway 1 is southeast that takes in the existing power plant, the highway, the large native vegetative screening buffers and the proposed power plant. Overall, visual quality is low.

Visual Exposure

On average, approximately 18,000 vehicles travel southbound on Highway 1 on a daily basis and viewer duration is moderate due to the existing screening. Considering the middleground distance of the proposed power plant, viewer exposure is low for KOP 8.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures in the middleground in regard to form, line, and scale. Scale contrast with existing industrial structures would be low because the power plant would be obscured from the view from the existing trees. The proposed earth tone of the project would contrast moderately with the color of the existing structures. Contrast with existing structures in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 8 toward the project site consist of trees in the middleground. The project is not visible from this view due to the tree cover, so the project would cause low contrast with vegetation in regard to form and line. Because the project cannot be seen from KOP 8, the increment of contrast with vegetation added by the proposed structures would be negligible.

Contrast with Land/Water

From KOP 8, the landforms are flat with trees and various vegetation in the middleground . The highway is the largest element of the view with the Salinas River and Harbor to the right. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. However, because the project structures are obscured by the existing vegetation, scale contrast would be negligible. The proposed earth tone of the project would contrast moderately with the color of the existing landforms, so color contrast would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures and industrial landscape, and would occupy a minor part of the setting. In addition, almost the entire power plant project is screened from view. Therefore, scale dominance from KOP 8 would be negligible.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 8 is panoramic, the project would be subordinate in regard to composition. Because only a small portion of the project would be visible from this view, spatial dominance in regard to backdrop would be negligible. The overall spatial dominance rating would be negligible.

VIEW BLOCKAGE

From KOP 8, the project would block a small part of the view of the sky. The existing industrial landscape already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be low.

Visual Impact

It can be concluded that the proposed power plant from this KOP will not have a significant impact based on the following summarization of visual factors for KOP 8:

- visual sensitivity is moderate to high;
- visual quality is low;
- visibility is low ;
- viewer exposure is low ;
- the highest levels of contrast would be low;
- scale dominance would be negligible;
- spatial dominance would be negligible; and
- view blockage would be low.

KEY OBSERVATION POINT 9- SOUTHEAST VIEW FROM MOSS LANDING STATE BEACH AT ELKHORN SLOUGH INLET

KOP 9 (see **VISUAL RESOURCES Figure 10** for location) represents the southeast view of the proposed plant site from the Moss Landing State Beach at the Elkhorn Slough Inlet. The applicant s proposal to remove the eight, 225-foot stacks and the visual effects are considered in this evaluation. Moss Landing Harbor is in the middleground to the right of the power plant.

Visual Sensitivity

Because the viewers from this KOP are tourists and local nature enthusiasts consist, visual sensitivity is considered high.

Visibility

The existing vegetation and existing power plant totally screens the proposed power plant and the existing PG&E switch yard, resulting in no visibility.

Visual Quality

The view from KOP 9 takes in the view of the existing power plant, which is in the middleground. Because of the presence of pre-existing commercial and industrial infrastructures, visual quality is considered low.

Visual Exposure

There is one residential viewer from this KOP and visitor counts to the State Park are estimated at approximately 191 per day. On average, there are approximately 191 visitors to the Moss Landing State Beach, and approximately 800 vehicles per

peak day (AFC pg. 6.13-50). Considering the middleground distance of the proposed power plant and obstructed view due to pre-existing industrial uses, viewer exposure is nonexistent. Considering these factors, viewer exposure is none for KOP 9.

Contrast

The proposed power plant would be obscured from view from the existing trees therefore contrast with structures, vegetation, land and water would be none.

SCALE DOMINANCE

The project is not visible from this view, therefore, scale dominance from KOP 9 would be none.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 9 is panoramic, the project would be subordinate in regard to composition. Because there are no visible portions of the project from this view, spatial dominance in regard to backdrop would be none. The overall spatial dominance rating would be none.

VIEW BLOCKAGE

From KOP 9, the existing industrial landscape blocks the view of the project so change that would be caused by the project would not be substantial. Therefore, view blockage would be none.

Visual Impact

It can be concluded that the proposed power plant from this KOP will not have a significant impact based on the following summary of visual factors for KOP 9:

- visual sensitivity is high;
- visual quality is low;
- visibility is none;
- viewer exposure is none ;
- the highest levels of contrast would be none;
- scale dominance would be none;
- spatial dominance would be none; and
- view blockage would be none.

KEY OBSERVATION POINT 10- NORTHEAST VIEW FROM ANTIQUE AREA ON MOSS LANDING ROAD

KOP 10 (see **VISUAL RESOURCES Figure 11** for location) represents the northeast view from the antique area on Moss Landing Road to the proposed plant site. The existing power plant is to the left. Commercial businesses are in the foreground, and the National Refractories facilities are to the right in the middleground.

Visual Sensitivity

Because the viewers from this KOP are mostly tourists with some residents, visual sensitivity is considered high.

Visibility

The existing National Refractories largest building, in the middle of the view, obscures the view of the proposed power plant, except for the tops of the stacks. Therefore, visibility is low.

Visual Quality

The view from KOP 10 takes in the view of the existing power plant and stacks in the middleground. Because of the presence of pre-existing commercial and industrial infrastructures, visual quality is considered low.

Visual Exposure

On average, approximately 33 people live nearby either in scattered housing within the harbor area or within boats docked at the harbor slips. Approximately 300 parking spaces are available for visitors in the area of the harbor, which are generally full during the weekends. Because residences and tourist are represented by this KOP, duration of view long. Considering the middleground distance of the proposed power plant, the number of viewers, and the long duration of view, viewer exposure is moderate.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures in the middleground in regard to form, line, and scale. Scale contrast with existing industrial structures would be low because the power plant would be obscured from the view from the existing industrial landscape. The proposed earth tone of the project would contrast moderately with the color of the existing industrial landscape. Contrast with existing structures in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 10 toward the project site consist of scattered trees and vegetation in the foreground. The project stacks are barely visible from this view due to the industrial nature of the area, so the project would cause low contrast with vegetation in regard to form and line. Because the project is barely seen from KOP 10, the increment of contrast with vegetation added by the proposed structures would be insignificant , and contrast with existing vegetation would also be low.

Contrast with Land/Water

From KOP 10, the landforms are flat with scattered trees and various vegetation in the foreground . No water is visible in this view. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. However, because the project

structures are obscured by the existing industrial development, scale contrast would be negligible. The proposed earth tone of the project would contrast moderately with the color of the existing land. The project size would appear as a minor element than that of the major land elements in the view, so scale contrast would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures and industrial landscape, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 10 would be low.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 10 is panoramic, the project would be subordinate in regard to composition. Because the tops of the stacks are barely discernable, spatial dominance in regard to backdrop would be insignificant. The overall spatial dominance rating would be negligible.

VIEW BLOCKAGE

From KOP 10, the project would block a small part of the view of the sky. The existing industrial landscape already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be negligible.

Visual Impact

It can be concluded that the proposed power plant from this KOP will not have a significant impact based on the following summary of visual factors for KOP 10:

- visual sensitivity is high;
- visual quality is low;
- visibility is low to moderate;
- viewer exposure is moderate;
- the highest levels of contrast would be low ;
- scale dominance would be negligible;
- spatial dominance would be negligible; and
- view blockage would be negligible.

KEY OBSERVATION POINT 11- NORTHEAST VIEW FROM MOSS ISLAND WITH HARBOR AREA IN FOREGROUND

KOP 11 (see **VISUAL RESOURCES Figure 12** for location) represents the northeast view from Moss Island with the harbor area in the foreground. The view is from the pier with water and other piers in the foreground. Boats docked in the slips are in the middleground with the industrialized areas of the power plant and the National Refractories buildings are on the horizon.

Visual Sensitivity

Because the viewers from this KOP is mostly tourists, visual sensitivity is considered high.

Visibility

The new stacks for the proposed power plant appear above the horizon, but below the tops of the boat masts. There are some trees which partially block views of the proposed plant. Visibility from this KOP is low.

Visual Quality

KOP 11 takes in the view of the existing power plant, Moss Landing Harbor in the foreground and the National Refractories in the horizon. The water provides visual value for views from boats in the marina, but due to the existing industrial development in the view, visual quality is reduced to moderate.

Visual Exposure

Approximately 8 people live in this area which will have a view of the power plant stacks in the horizon. In addition approximately 1,500 daily vehicle trips occur along this stretch of the harbor. The view duration for commercial boaters is long and casual boaters is short therefore overall viewer exposure is moderate. The eight residences represented by this view is small and duration of view is long, therefore overall viewer exposure is moderate.

Contrast with Structures

The proposed power plant would cause a low level of contrast with existing industrial structures in the middleground in regard to form, line, and scale. Scale contrast with existing industrial structures would be low because the power plant would be obscured from the view from the existing industrial landscape. Contrast with existing structures in regard to form and line would be low.

Contrast with Vegetation

Vegetation visible in the view from KOP 11 toward the project site consist of scattered trees and vegetation in the middleground. The project stacks are barely visible from this view due to the industrial nature of the area, so the project would cause low contrast with vegetation in regard to form and line. Because the project is barely seen from KOP 11, the increment of contrast with vegetation added by the proposed structures would be low.

Contrast with Land/Water

From KOP 11, the landforms are flat with scattered trees and various vegetation in the middleground . Water is visible in this view from the marina. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. However, because the project structures are obscured by the existing industrial development, scale contrast would be negligible. The proposed earth tone of the project would contrast moderately with the color of the existing land. The project size would

appear approximately the same size as the existing industrial and commercial nature of the area in the foreground and middleground, so scale contrast would be low.

SCALE DOMINANCE

The project would appear small in comparison to the wide field of view, similar to the existing power plant structures and industrial landscape, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 11 would be negligible.

SPATIAL DOMINANCE

Because the spatial composition of the view from KOP 11 is panoramic, the project would be subordinate in regard to composition. Because the top of the stacks are barely discernable, spatial dominance in regard to backdrop would be insignificant. The overall spatial dominance rating would be negligible.

VIEW BLOCKAGE

From KOP 11, the project would block a small part of the view of the sky. The existing industrial landscape already block more of the view than the project would, so change that would be caused by the project would not be substantial. Therefore, view blockage would be negligible.

Visual Impacts

It can be concluded that the proposed power plant from this KOP will not have a significant impact based on the following summary of visual factors for KOP 11:

- visual sensitivity is high;
- visual quality is moderate;
- visibility is low;
- viewer exposure is moderate ;
- the highest levels of contrast would be low ;
- scale dominance would be low;
- spatial dominance would be negligible; and
- view blockage would be negligible.

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 these measures in the proposed condition of certification to reduce the lighting impacts to less than significant.

VISIBLE PLUMES

The potential exists for white vapor plumes (water vapor condensation from the exhaust) to be visible from the project stacks. 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.

As provided in the AFC (pg. 6.13-14), periods of reduced visibility tend to occur more frequently during the summer and early fall (July through October) than other times of the year. Visibility is reduced, due to fog or ocean mist, during early morning hours until 2 to 3 hours after sunrise. Visibility is also diminished during light to dense fog formation, on hazy spring and summer days, and under low clouds (Continental Weather and Earth Sciences, Inc., 1998).

The meteorological conditions during the winter months are generally foggy and such plumes will not be visible much of the time.

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 four exhaust stacks, proposed to be 145 feet tall. The maximum predicted height of the plume above the exhaust stacks is unknown at this time. Staff has requested that the applicant prepare a plume modeling analysis simulating the MLPP cooling tower plumes and expected frequency of occurrence, duration, height, and width of the plume based on meteorological data in the area. Once this data is received, staff will be able to fully assess the plume-induced visual impacts.

CUMULATIVE IMPACTS

The proposed power plant would add a noticeable but not considerable increment to the existing industrial character of the Moss Landing area. As addressed in the AFC and discussed in staff s analysis, the applicant is proposing major improvements to the existing power plant facilities. The major improvement will be the removal of eight, 225-foot tall stacks, and the eventual phased removal of fuel storage tanks which will be completed under a County permit (demolition permit).

These actions will considerably reduce the portion of the horizontal field of view occupied by MLPP and the existing power plant. The tanks will no longer occupy the ridgeline seen from the Elkhorn Slough Visitor Center (KOP 4). The tank removal will improve the character of the landscape north of Dolan Road, as seen in KOP 7. The removal of these tanks and of the eight, 225-foot tall stacks will have important positive cumulative visual effects. In addition, the existing and proposed power plants will be outfitted with modernized lighting to control upward glare. There are no proposed or planned land use developments within a 1-mile radius of the MLPP. As discussed in the AFC, there are a few developments planned within a 5-mile radius of Moss Landing. Two of the projects are anticipated to be completed prior to start of construction of the MLPP. The Moro

Cojo Subdivision is anticipated to be completed in January 2000 and the renovation of the Moss Landing Marine Lab was scheduled for completion in November 1999.

As discussed in the AFC (pg.6.13-60) the applicant proposes various improvements to the current power plant such as:

- Removal of eight, 225-foot tall stacks
- Phased removal of fuel storage tanks under a County level permit
- The upgrade of Units 6 and 7 and the installation of Selective Catalytic Reduction

The evaluation of the eleven KOP s demonstrates that some views of MLPP will be improved, although a few may be partially occupied by the new units. Because most viewers will see a measured improvement, the overall visual assessment is positive.

In conclusion, the proposed power plant would not contribute substantially to a significant cumulative visual impact.

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 lines 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 lines to reduce visual impacts.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

LOCAL

COUNTY OF MONTEREY

The applicant will prepare a landscape plan when final construction drawings of the project are completed. The landscape plan is intended to conform to the landscape requirements in Part 2 of the Monterey County Coastal Implementation Plan. Once available, the applicant will send a copy of the landscape plan to Monterey County for review and the Energy Commission for review and approval. Staff recommends the adoption of a condition of certification to ensure that the landscape plan and its implementation satisfy the requirements of the Monterey County Coastal Implementation Plan.

MITIGATION

APPLICANT S PROPOSED MITIGATION

SPECIFIC MITIGATION MEASURES

The Applicant has proposed three mitigation measures to make the project more aesthetically acceptable (MLPP 1999, p.6.13-61):

- All structures, stacks, buildings, and tanks will be constructed of materials that restrict glare, and will be finished with flat, earth tones that will blend with the surrounding environment.

- Lighting at the power plant site will be taken into account in the layout and design of the project.

- Many berms currently exist at the site. Those around the perimeter are to remain, since they are vegetated and will provide screening for the new plant. Fill generated from the removal of berms on the interior can be used to create new berms between the new plant and Dolan Road for additional screening.

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. Extensions of these measures and other measures, as proposed below by Energy Commission staff, will ensure that visual impacts will be minimized.

STAFF S PROPOSED ADDITIONAL MITIGATION

STAFF MITIGATION 1 (CONDITION 1)

A specific painting plan is needed to assure 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 components of buildings, structures and linear facilities can have colors approved and included in bid specifications for such buildings or structures.

STAFF MITIGATION 2 (CONDITION 2)

As indicated in the Monterey County Coastal Implementation Plan Part 1and 2, material storage areas shall be screened by solid walls, fences, or adequate plantings. Staff has provides a condition of certification which requires non-reflective and screened fencing to insure compliance with the requirements of the zoning ordinance.

STAFF MITIGATION 3 (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 4 (CONDITION 4)

A specific landscaping plan should be prepared showing the location of landscaping, the varieties and sizes of plants proposed to be used, and the proposed time to maturity for proposed plants.

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.

In addition, the removal of eight intermediate 225-foot tall stacks from the existing power plant and additional landscaping around the perimeter of the property represents an overall visual improvement.

As discussed in staff s analysis of condensation plumes, only certain meteorological conditions will cause the development of a plume during any given time. As discussed previously, additional information on plumes has yet to be analyzed and therefore staff has not yet reached a conclusion regarding the impacts of condensation plumes.

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 Monterey County for review and comment and to the California Energy Commission Compliance Project Manager (CPM) for final 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.

The project owner should not specify the treatment of 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 has 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 and shall have slats within the fencing to provide sufficient screening. 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 and provide sufficient screening.

The project owner shall not order the fencing until the project owner receives approval of the fencing submittal from the CPM.

Verification: At least 30 days prior to ordering the non-reflective and screened 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 (existing and proposed power plant), 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; and

- 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.

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 prior to start of construction, 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.

The project owner shall notify the CPM within seven days of completing exterior lighting installation that the lighting 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 Monterey County Zoning Code.

a. The project owner shall submit to Monterey County for review and to the CPM for review and approval a specific plan describing its landscaping proposal, stating that it conforms to Monterey County s Zoning Code. 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; and
- a procedure for replacing unsuccessful plantings.

b. 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 Monterey County for review and comment and 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 notify the CPM in the next Monthly Compliance Report following completion of the proposed planting that the planting is ready for inspection.

REFERENCES

Andrews, Richard N.L., 1980, Landscape Values in Public Decisions. In Proceedings Our National Landscape: A Conference on Applied Techniques for Analysis and Management of the Visual Resource, pp. 686-692, April 23-25, 1979, Incline Village, Nevada. General Technical Report PSW-35. U.S. Dept. of Interior, Forest Service, Pacific Southwest Forest and Range Experiment Station. Berkeley, CA. NTIS PB81-157620.

Blair, William G., 1980, Visual Resource Management, in Environmental Comment

Blair, William G., 1986, Visual Impact Assessment in Urban Environments. In Foundations for Visual Project Analysis, Richard C. Smardon, James F. Palmer, and John P. Felleman, eds. PP.223-244. John Wiley & Sons. New York.

Buhyoff, Gregory J. et al.

CEC, 1993a, Commission Decision Application for a Small Power Plant Exemption including: Revised Initial Study/Mitigated Negative Declaration Carson Energy Group and Central Valley Financing Authority s Application for a Combined Cycle Cogeneration Facility and Ice Manufacturing Plant, issued June 23, 1993.

Crystal, Joseph H., 1978, Measuring Scenic Quality at the Urban Fringe. Landscape Research 3(3), 9-11, 14.

MLPP (Moss Landing Power Project). 1999a. Application for Certification, Moss Landing Power Project (99-AFC-4). Submitted to the California Energy Commission, May 7.

MLPP(Moss Landing Power Project), Duke Energy Responses to California Coastal Commission Follow-up Questions, October 25, 1999

Felleman, John P., 1986, Landscape Visibility. In Foundations for Visual Project Analysis, Richard C. Smardon, James F. Palmer, and John P. Felleman, eds. Pp.47-62. John Wiley & Sons. New York.

Grinde, Kate and Al Kopf, 1986, Illustrated Glossary. In Foundations for Visual Project Analysis, Richard C. Smardon, James F. Palmer, and John P. Felleman, eds. Pp.307-333. John Wiley & Sons. New York.

ATTACHMENT 1

LIGHTING COMPLAINT RESOLUTION FORM

MOSS LANDING POWER PROJECT **Monterey County**
Complainants 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: Complainants 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 12

VISUAL RESOURCES Figure 2
KOP 1

VISUAL RESOURCES Figures 3
KOP 2

VISUAL RESOURCES Figure 4
KOP 3

VISUAL RESOURCES Figure 5
KOP 4

VISUAL RESOURCES Figure 6
KOP 5

VISUAL RESOURCES Figure 7
KOP 6

VISUAL RESOURCES Figure 8
KOP 7

VISUAL RESOURCES Figure 9
KOP 8

VISUAL RESOURCES Figure 10
KOP 9

VISUAL RESOURCES Figure 11
KOP 10

VISUAL RESOURCES Figure 12
KOP 11

VISUAL RESOURCES APPENDIX B
Commission Staff s Visual Assessment Methodology 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 that a project should 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, э 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.

REFERENCES TO APPENDIX B

Andrews, Richard N.L. 1980. Landscape Values in Public Decisions. In *Proceedings of Our National Landscape: A Conference on Applied Techniques for Analysis and Management of the Visual Resourc*e, pp. 686-692, April 23-25, 1979, Incline Village, Nevada. General Technical Report PSW-35. U.S. Dept. of Interior, Forest Service, Pacific Southwest Forest and Range Experiment Station. Berkeley, CA. NTIS PB81-157620.

Blair, William G. 1980. Visual Resource Management. In Environmental Comment.

Blair, William G. 1986. Visual Impact Assessment in Urban Environments. In Foundations for Visual Project Analysis, Richard C. Smardon, James F. Palmer, and John P. Felleman, eds. PP.223-244. John Wiley & Sons. New York.

Felleman, John P. 1986. Landscape Visibility. In Foundations for Visual Project Analysis, Richard C. Smardon, James F. Palmer, and John P. Felleman, eds. Pp.47-62. John Wiley & Sons. New York.

Grinde, Kate and Al Kopf. 1986. Illustrated Glossary. In Foundations for Visual Project Analysis, Richard C. Smardon, James F. Palmer, and John P. Felleman, eds. Pp.307-333. John Wiley & Sons. New York.

Smardon, Richard C., Tony Costello, and Harry Eggink. 1986. Urban Visual Description and Analysis. In Foundations for Visual Project Analysis, Richard C. Smardon, James F. Palmer, and John P. Felleman, eds. Pp.21-35. John Wiley & Sons. New York

CULTURAL RESOURCES

Deborah K. B. McLean

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 will result in 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 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 that ensure no significant adverse impacts will occur. The determination of potential impacts to cultural resources from the proposed Moss Landing Power Plant (MLPP) is required by Section 106 of the National Historic Preservation Act, the Siting Regulations of the California Energy Commission (Energy Commission) and by the California Environmental Quality Act (CEQA). Unless recommendations are adhered to, impacts to cultural resources may result either directly or indirectly during preconstruction, construction, or operation of the project. Cumulative impacts may be associated with the proposed project, and other projects in the same area of similar size and requirements.

In California, many cultural resource sites are already known, and the records and maps for these sites are on file at the regional Archaeological Information Center of the California Historical Resources Information System 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 (NRHP). However, many areas of the state have not been fully explored or mapped and there are cultural resources and sites that 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 archaeological resources, historic archaeological resources, and ethnographic resources.

Prehistoric archaeological resources are those materials relating to prehistoric human occupation and/or use of an area. These resources, commonly referred to as sites, may include cultural 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 into the 18th century when the first Euro-American explorers settled in California.

Historic archaeological resources are those usually associated with Euro-American exploration and settlement, and the beginning of a written historic record; these sites may include archaeological deposits, structures, traveled ways, artifacts, documents, or other evidence of human activity. Under federal and State requirements, cultural resources must be greater than 50 years old to be considered of potential historical importance.

Ethnographic resources are those important to the heritage of a particular ethnic or cultural group, such as Native Americans, African, European, or Asian immigrants. These resources 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, Section 431 et seq.) and subsequent related legislation, policies and enacting responsibilities, e.g., federal agency regulations and guidelines for implementation of the Antiquities Act. 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

- 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 U.S. Secretary of the Interior has published a set of Standards and Guidelines for Archaeology and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archaeological and historic properties. The Secretary s standards and guidelines are used by federal agencies, such as the Forest Service, the Bureau of Land Management, and the National Park Service. The State Historic Preservation Office refers to these standards in its

requirements for 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 consultation beginning at the early stages of project planning. Regulations revised in 1997 (36 CFR Part 800 et. seq.) set forth procedures to be followed for determining eligibility for nomination, the nomination, and the listing of cultural resources in the National Register of Historic Places (NHRP). The eligibility criteria and the process are used by federal, state, and local agencies in the evaluation of the significance of cultural resources. Similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the California Register of Historic Resources (CRHR). 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 CFR 8921) orders the protection and enhancement of the cultural environment by providing leadership, establishing state offices of historic preservation, and developing criteria for assessing resource values.

- American Indian Religious Freedom Act; Title 42, United States Code, section 1996 protects Native American religious practices, ethnic heritage sites, and land uses.

- Native American Graves Protection and Repatriation Act (NAGPRA)(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.

STATE

- Public Resources Code (PRC) section 5020.1 defines several terms, including the following:
  (j) historic resource includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript that 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 historic resource would be impaired.

- Public Resources Code, section 5024.1 establishes a California Register of Historic Resources (CRHR); sets forth criteria to determine significance; defines eligible properties; and lists nomination procedures.

- Public Resources Code, section 5097.5 states that any unauthorized removal or destruction of archaeological or paleontological 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 5097.94 and section 5097.98 define 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. CEQA: This act requires the analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.

- Public Resources Code, section 2183.2 states that, if a project may affect a resource that has not met the definition of an historic 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 Environmental Impact Report (EIR) shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, such resources must be avoided; if they cannot 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 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 an historic resource and describes what constitutes a significant historic resource.

- CEQA Guidelines, Title, 14 California Code of Regulations, section 15126.4 Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects: subsection (b) discusses impacts of maintenance, repair, stabilization, restoration, conservation, or reconstruction of an historic resource. Subsection (b) discusses mitigation through avoidance of damaging effects on any historic 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 Historic Resources. Subsection (a) defines the term historic 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 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 paleontological resources.

- California Penal Code, section 622.5. Anyone who willfully damages an object or thing of archaeological or historic interest can be found guilty of a misdemeanor.

- Health and Safety Code, section 7050.5 states that if human remains are encountered, no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to PRC Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the descendant may inspect the site of the discovery. The descendant shall complete the inspection within 24 hours of notification by the NAHC. The MLD may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

LOCAL

To encourage the conservation and identification of Monterey County s archaeological resources, the County will: 1) identify and conserve important representative and unique archaeological sites and features; and 2) encourage various historical and educational societies or other appropriate organizations in their efforts to improve the public s recognition of its cultural heritage and the citizen s responsibilities for archaeological or cultural resource preservation. These objectives will be accomplished through the following:

- The County shall take such action as necessary to compile information on the location and significance of its archaeological resources so this information may be incorporated into the environmental or development review process;

- The Archaeological Sensitivity Zones map shall be used, along with whatever other data is appropriate, to evaluate whether archaeological resources are threat-ened by proposed development projects. The map shall be updated continuously as new data become available.

- All proposed development, including land divisions, within high sensitivity zones shall require an archaeological field inspection prior to project approval;

- All major projects (i.e., 2.5 acres or more) that are proposed for moderate sensitivity zones, including land divisions, shall require an archaeological field inspection prior to project approval;

- Projects proposed for low sensitivity zones shall not be required to have an archaeological survey unless specific additional information has been obtained to suggest that archaeological resources are present;

- Where development could adversely affect archaeological resources, reasonable mitigation procedures shall be required prior to project approval; and

- All available measures, including purchase of archaeological easements, dedication to the County, tax relief, purchase of development rights, consideration of reasonable project alternatives, etc., shall be explored to avoid development on sensitive archaeological sites (Monterey County, 1982a, pages 29-30).

MONTEREY COUNTY, CALIFORNIA NORTH COUNTY LAND USE PLAN, LOCAL COASTAL PROGRAM

The Coastal Act was passed by the State Legislature and became effective on January 1, 1977. The Act established a framework for resolving conflict among competing uses for coastal land and placed its highest priority on the preservation and protection of natural resources. Local government carries out the goals and policies of the act. Monterey County is divided into four zones. The MLPP is in the area addressed by the North County Land Use Plan.

KEY POLICY

- Key policies of the North County Land Use Plan include the maintenance and protection of archaeologically sensitive areas, whether or not they have been surveyed and mapped. New land use will be considered compatible with the Plan s objectives only if there is a design to avoid or minimize impacts to archaeological resources.

GENERAL POLICIES

- The North County Land Use Plan stipulates that Monterey County shall encourage timely identification of archaeological resources so that preservation of resources can be considered during the conceptual design phase of land use planning or project development.
- Whenever development occurs in the coastal zone, including excavation activity and vegetation removal for agricultural use, the Archaeological Site Survey

Office or other appropriate authority shall be contacted to determine whether there has been an archaeological survey. If no survey has been completed, the parcel on which the proposed development will be placed shall be surveyed if located within 100 yards of various floodways specified in the North County Land Use Plan.

- Additionally, a survey shall be completed if the parcel is located within 100 yards of a known archaeological site. The archaeological survey should address the sensitivity of the site, appropriate levels of development, and mitigation consistent with the site s need for protection.

- All available measures shall be explored to avoid development on sensitive prehistoric or archaeological sites.

- When developments are proposed in areas where cultural resources have been identified, projects shall be designed to avoid impact. Emphasis shall be placed on preserving the entire site rather than on excavation, particularly where the site has religious significance.

SPECIFIC POLICIES

- No development in archaeologically sensitive areas or restricted under General Policies shall be categorically exempt from environmental review.

- If avoidance is not possible, mitigation shall be conducted in accordance with guidelines of the State Office of Historic Preservation and the State of California Native American Heritage Commission. Any adverse impact of development on cultural resources shall be mitigated to the maximum extent feasible. Off-road vehicles, unauthorized collecting of artifacts, and other activities potentially damaging to cultural resource sites are prohibited.

- Access to known cultural resource sites shall be limited. Any access should be concentrated in areas with supervision or interpretive functions (Monterey County 1982b),

ENVIRONMENTAL SETTING

REGIONAL DESCRIPTION

The project area is located in Elkhorn Valley, which was initially created by the drainage of Great Valley through what is now Santa Clara Valley into Monterey Bay. During the late Pleistocene (150,000 to 300,000 before present [B.P].), the flow of these major rivers into the upper reaches of Elkhorn Valley was cut off by movement and uplift along the San Andreas Fault. Water that had flowed through Elkhorn Valley was now retained in the southern Santa Clara Valley to form Lake Benito. Pajaro River was formed by continued fault movement, and it drained into the lake. Increased precipitation and runoff during the glaciations of the late Pleistocene resulted in smaller temporary creeks in Elkhorn Valley. Stratigraphy in the western end of Elkhorn Slough indicates that between 16,000 and 10,000 years

B.P., such a creek still existed in the Elkhorn Slough (Dietz et al. 1988, page 8). At the end of the Wisconsin glacial period, as sea level rose rapidly, marine water flooded the lower portions of Elkhorn Valley, and between 10,000 and 8,000 years B.P. formed a high energy tidal inlet. Subsequent infilling of the main slough channel eventually impaired direct connection with the ocean, and the energy of the depositional environment was greatly reduced, thus creating a quiet water estuary or coastal lagoon from approximately 5,000 years B.P. to A.D. 1946. Salinity in the slough is believed to have been relatively brackish between 5,000 and 2,000 years B.P. (Dietz et al. 1988, page 8).

Moss Landing Power Plant is situated on the south bank of Elkhorn Slough, which today is the main branch of a system of tidal channels that enter the coastal plain of northern Monterey County at Moss Landing Harbor, and reach inland for approximately seven miles. A basin, formed by this channel system, is lined by alternating communities of salt marsh and mudflat, and is bordered to the east and northeast by rolling hills that extend into steeper terrain at the southern end of the Santa Cruz Mountains. Adjacent drainage systems are the Pajaro River to the north and the Salinas River to the south (Dietz et al. 1988, page 7).

Prior to 1908, the Salinas River curved northward near the location of its present mouth and ran parallel to the coastline for approximately six miles, emptying into the ocean about one mile north of the present harbor mouth. Elkhorn Slough opened into the river near the present site of Moss Landing Harbor, creating a brackish estuarine environment. Occasionally, during severe winters, the Salinas River reportedly cut through sand dunes near its present mouth and emptied into the ocean there. Land movement created by the 1906 earthquake created a more permanent ocean outlet at the same location, and flood control dam construction after 1908 made that outlet permanent (Dietz et al. 1988. page 7).

With the former mouth of the Salinas River kept open by tidal action, and the cessation of freshwater flow into the Elkhorn Slough Basin, the brackish estuary was replaced by the saline estuary that is present today. The present-day mouth of the slough is a man-made channel that was constructed as the entrance to the Moss Landing Harbor in 1946. Since the construction of the harbor jetty, the old mouth of the Salinas River (north of Moss Landing) has gradually silted in and closed (Dietz et al. 1988, pages 7-8).

PROJECT VICINITY DESCRIPTION

The proposed project is located within the existing MLPP, 12 miles northwest of Salinas, California in Monterey County near the Moss Landing Harbor, in an area that includes industrial facilities, agricultural lands, residences, recreational beaches and tidal wetlands. It is bordered on the west by Highway 1 and Moss Landing Harbor and on the south by Dolan Road. Elkhorn Slough is to the north, and Moro Cojo Slough is to the south. The current MLPP is situated on 239 acres.

Duke Energy has proposed a modernization plan designed to make MLPP a competitive energy facility. The Modernization Plan includes demolition of tanks and eight 225-foot tall stacks. These actions are associated with ongoing

operations at MLPP. They will be permitted by Monterey County and will be consistent with the North County Land Use Plan (discussed in the LORS section of this document). The demolition of the fuel oil tanks will involve removal of tanks 1 through 19 and may require soil or ground water remediation (MLPP 1999a p2-9).

The proposed project will not require installation of new high-voltage transmission lines. Instead, power from the combined-cycle units will tie into the existing PG&E 230-kV switchyard located immediately north of MLPP. Electrical connections will be constructed within the power plant to connect the new units to the switchyard. Existing offsite transmission lines connect MLPP to the regional and statewide electric grid. Existing roads will be used for site access.

The proposed project will improve the existing seawater intake structures for retired units 1 through 5 and traveling screens will be moved from the present location, 350 feet west, to the intake area. The project will now discharge cooling water through existing discharge structure for units 6 and 7. Modifications to the project and changes to intake and discharge structures will necessitate the instillation of six 54 inch diameter discharge lines. An 84 inch diameter line will be installed connecting the new combined cycle units and the existing units 6 and 7 discharge system. If possible a portion of the existing 54-inch discharge lines will be reused in place (Duke Energy 1999e).

For the most part existing natural gas pipelines and connections will be used. However, a new approximately 1,500 foot long, 14 inch diameter natural gas line will be installed between existing connections. The trench for the gas line will be about 20 inches wide and 5 feet deep. Trenching will be accomplished with a trencher or a backhoe. The laydown/staging area will be located next to tanks #3 and #4, and will be approximately 40,000 square feet. Additional information can be found in the Project Description section of this Preliminary Staff Analysis.

PREHISTORIC SETTING

There are eight recorded prehistoric sites within one kilometer of MLPP project. Four of the sites, CA-MNT-229, CA-MNT-228, CA-MNT-234, and CA-MNT-1570, have been tested and are the major contributors to current knowledge pertaining to the prehistory of the area. Site CA-MNT-229 is situated within the APE, in the northwest corner. It is within Area 1, extends to the harbor, and is bisected by State Highway 1 (Duke Energy 1999b, pages 4 and 6).

All four sites exhibit a consistent pattern of occupation during the Millingstone/Archaic (older than the Early Period, but no clear time definition is available) and Middle Period (1000-2500 B.P.) and perhaps during the Early Period (2500-5000 B.P.). Each of the sites appears to contain a component between approximately 6,000 and 7,000 years B.P., the Millingstone/Archaic Period. This component appears to represent use of the Moss Landing area by foragers with a high degree of residential mobility. Shellfish are the dominant material in this component, along with smaller quantities of stone tools, non-fish bone, and fish bone. Artifacts from this component at CA-MNT-229 include a fragmentary eccentric crescent, long-stemmed projectile points, and cobble tools. The slough

environment was probably dominated by freshwater during this period (Duke Energy 1999b:6-7).

The Early Period is represented by several radiocarbon dates, and differences in shellfish, fish bone, non-fish bone, and artifacts from the previous period. One radiocarbon date, 3180+/-80 B.P., was available from CA-MNT-229. A deeply buried lithic workshop at CA-MNT-234 is also representative of this period. The slough environment was probably dominated by saltwater during this time (Duke Energy 1999b:7).

The Middle Period is represented by numerous radiocarbon dates, numerous obsidian dates, and a variety of temporally sensitive artifacts. The Middle Period component appears to be the most extensive at several or all four of these sites. The slough environment was probably dominated by brackish water during this period (Duke Energy 1999b:7-8).

ETHNOGRAPHIC BACKGROUND

Ethnohistorically, Monterey County was inhabited by three different Indian groups, the Costanoan (or Ohlone), Esselen, and Salinan. Each group had its own language. The MLPP project area was inhabited by the Costanoan. Their territory extended from the Golden Gate area of San Francisco south to the vicinity of Point Sur. It extended inland as far as the Mt. Diablo Range in the north, as far as Soledad in the Salinas Valley, and approximately 10 to 15 miles up the Carmel Valley from the coast (Duke Energy 1999b:8).

Within the Costanoan language group there were at least seven different dialects, most named after the mission that was established in the area. The MLPP project area was inhabited by the San Juan Bautista (Mutsen) speaking group. This group was in turn divided into an unknown number of nations as the Spanish called them. This refers to a tribelet, the largest politically cohesive land-holding group. Each nation was further divided into smaller living groups known as rancherias by the Spanish. Many of the living groups and some of the villages were probably kin groups, containing 20 to 40 people. Archaeological evidence indicates that there were also villages whose population must have numbered in the hundreds (Duke Energy 1999b).

HISTORIC SETTING

Prior to the arrival of European settlers, Native Americans, who occupied the land for hundreds of generations, had co-existed with the environment. They were seasonal hunter-gatherers, moving when either the climate or availability of floral and fauna demanded. In startling contrast to this way of life, the new settlers brought range cattle, railroads, and the quest for real estate (Urbas 1999, page 3).

Moss Landing was originally settled by Paul Lezer. In 1860, Lezer purchased 300 acres of land at the mouth of the Salinas River from the State of California for one dollar per acre. Lezer planned to establish a settlement called the City of St. Paul, and installed a ferry across the Elkhorn Slough. The area became known as Moss Landing after a New England captain, Charles Moss; Moss recognized the potential

for the port to handle large quantities of grain for shipping. In 1866, he built a wharf and ran barges down the Salinas River to carry loads of grain being exported to the Pacific Steamship Company s service to San Francisco. Warehouses sprang up near the wharf and a settlement was formed (Fink in Urbas 1999, page 4). The landing was also used as a whaling station until it was abandoned in 1888. The original Moss residence is listed on the California Listing of Historic Resources (1976) (Urbas 1999, page 4).

Moss Landing was known for its canning plants, as well as its shipping access. Canneries have operated in this area since the late 19th century (Kandler and Rudo in Urbas 1999, page 4). The earthquake of 1906, best known for devastating the San Francisco area, also destroyed most of the canneries in the Moss Landing area. The area was rebuilt from the rubble, and the canning industry reached its highest production levels during and immediately following World War II. Due to the overexploitation of the fishing resources in modern times, the fishing industry has suffered severe declines, with many of the original processing plants closing; however, several canneries still operate near the project area today (Kandler and Rudo in Urbas 1999, pages 4-5).

In the late 1930s, PG&E bought land from Cato Vierra in preparation for construction of the MLPP. During the 1940s, within Monterey County, the area of Moss Landing was targeted for industrial development. Taxes, investment, and employment that were brought to the community by PG&E were an important part of county planning. Development of the steam plant known as MLPP began in 1948.

PRE-AFC LITERATURE AND RECORDS SEARCH

Prior to preparation of the AFC, the consultant to the applicant conducted a records search and literature review through the Northwest Information Center of the California Historical Resources Information System, located at Sonoma State University, Rohnert Park. A records search through the regional information center is required by state guidelines and professional standards. Upon completion of the project, a copy of the cultural resources report must be filed with the appropriate information center .

The information center houses site, survey, and excavation information pertinent to the Area of Potential Effects (APE). This allows the researcher to determine what site types may be present within the boundaries of the APE and what their eligibility status is regarding the National Register of Historic Places (NRHP), the California Register of Historic Resources (CRHR) and/or any local register.

The archival review included an examination of archaeological site records, maps, and project reports and files. Additionally, files and maps at Archaeological Consulting (consultant s firm), were reviewed. Several archaeological reports were produced for PG&E and had not been filed with the Northwest Information Center. Contacts were established to obtain copies of these reports (Duke Energy 1999b, page 3). All information obtained as a result of the records search provided the consultant with information necessary to evaluate the project s potential to affect cultural resources during construction and operation.

Results of the literature review and a brief description of the known resources are summarized in this document under the heading Prehistoric Setting and in the AFC, in Section 6.7. Site specific information was filed with the Energy Commission under confidential cover.

Prior to Duke Energy s interest in the MLPP, one survey and three excavations had taken place within the APE. In 1973, all of Area 7 was surveyed by Roberta Greenwood (Duke Energy 1999b) in conjunction with the development of the east tank farm. Survey results were negative. In 1979, Ann Peak conducted a test excavation at CA-MNT-229 in association with the installation of sewer pipe lines and pump stations. In 1984, Steven Dondero (Dondero et al. 1984) completed additional testing at site CA-MNT-229. This test excavation resulted in the site being recommended as eligible for the NRHP under criterion d, the site s potential to provide information important to our understanding of the prehistory of the area. In 1985, (Dietz et al. 1988) completed a data recovery program at CA-MNT-229. This data recovery was conducted prior to the widening of the Elkhorn Slough Bridge. Only portions of the site that were to be impacted by construction were excavated.

FIELD SURVEYS

On February 2 and 25, 1999, Archaeological Consulting archaeologist Mary Doane completed an on-site pedestrian survey of the accessible portions of the APE. Soil visibility in the northwest portion of Area 1 provided evidence of archaeological site CA-MNT-229. Area 2 was completely obscured by buildings. The portion of Area 3 east of Highway 1 was also completely obscured by buildings. Area 3 on the west side of Highway 1 provided some soil visibility. There was no evidence of archaeological material. Access onto portions of Areas 4, 5, 6, and 7 was limited due to standing water. The parts of these parcels that were examined showed no evidence of archaeological material (Duke Energy 1999b, page 3).
On June 10, 1999, Archaeological Consulting archaeologist Mary Doane returned to MLPP to survey the areas that had been submerged during the February survey. She was able to survey all of Areas 4, 5, and 6. Other than a small area around the sump pump east of storage tank #7, she was able to survey all of Area 7. No evidence of cultural material was identified during this survey (Duke Energy 1999b, page 3).

NATIVE AMERICAN CONTACTS

On March 9, 1999, Carolyn E. Trindle of TRC Environmental Solutions, Inc. (TRC) contacted the NAHC on behalf of Duke Energy to request a search of the Sacred Lands File and a list of Native Americans who are on file with the NAHC as contacts for the vicinity of Moss Landing. Two names were provided, Phillip Galvan and Andrew Galvan, father and son, respectively (TRC phone log April 9, 1999).
Robert C. Mason, Vice President of Planning and Development for TRC, contacted Phillip Galvan and Andrew Galvan on March 24, 1999. He requested their responses to information pertaining to the Duke Energy proposed project for MLPP(TRC letter March 24, 1999). Between the dates of March 31 and April 21, 1999, Ms. Trindle telephoned Andrew Galvan four times and Debbie Treadway of

the NAHC twice. Ms. Trindle notified Andrew Galvan that a copy of the consultant s report was mailed to him on April 8, 1999. Andrew Galvan acknowledged receipt of the report (TRC phone logs March 31, April 7,9,15, and 19, 1999).

Andrew Galvan also contacted Ms. Treadway to review a file of information on a Sacred Site that had been filed by his father. Andrew Galvan was to review the information and plot the Sacred Site on a map of the MLPP. During a telephone conversation between Andrew Galvan and Ms. Treadway, Mr. Galvan stated that he was very busy with work but would get back to TRC. As of December 1, 1999, he has not contacted TRC regarding the location of the Sacred Site (TRC phone log April 21, 1999).

SUMMARY OF KNOWN CULTURAL RESOURCES WITHIN THE APE

The records search and field survey of the APE indicate that there is one NRHP eligible site within the APE. Site CA-MNT-229 is classified as a 2S1 site, which means it has been determined eligible for separate listing by the Keeper of the Record (Duke Energy 1999b, page 5) Testing has occurred twice at this site (Peak 1979; Dondero et al. 1984). In 1985, data recovery was conducted in conjunction with the widening of the bridge over Elkhorn Slough (Dietz et. al. 1988). Excavation occurred only in the areas where construction related impacts to the site were expected.

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 influence the analysis of impacts to the resources and the measures that may be required to mitigate any such impacts.

Under federal law, only historic or prehistoric sites, objects or features, or architectural resources that are assessed by a qualified researcher as signifi-cant in accordance with federal guidelines typically need to be considered during the planning process. The significance of historic and prehistoric cultural resources is judged in accordance with the criteria for eligibility for nomination to the NRHP as defined in 36 CFR Section 60.4. If such resources are determined to be significant, and therefore eligible for listing in the NRHP (or the CRHR), they are afforded certain protection under Section 106 and/or CEQA. The Advisory Council on Historic Preservation, for example, must be given an opportunity to comment on any federally funded or permitted under-taking that could adversely affect such resources.

The NRHP 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. The state has a similar set of criteria.

Under federal law, resources determined not to be significant, that is, not eligible for NRHP 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 records and literature search and the on-site pedestrian surveys of the proposed project APE were conducted to identify the presence of any cultural resources sites or materials. Where resources were identified, additional evaluation was conducted to determine whether the resources are already listed on, or are potentially eligible for listing on either the NRHP (36 CFR 800) or the CRHR.

The State Resources Agency has adopted considerable revisions to the regulations implementing CEQA. These changes affected the language applicable to staff s analysis of cultural resources. Previously, the bulk of the information on how to assess resource and impact significance and on the types of mitigation measures available was contained in Appendix K of the CEQA Guidelines. Much of the language of that appendix has now been incorporated into Title 14, 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. 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.

Test excavations (discussed in the Pre-AFC Literature and Records Search section of this document) completed in 1984, resulted in the site being recommended for eligibility to the NRHP. The NRHP determined the site to be significant and eligible for listing under criterion d . Using the above criteria, staff concurs that the NRHP eligible cultural resources site, CA-MNT-229, described in the AFC and in subsequent filings for the MLPP project, is an historic resource.

Finally, CEQA contains a statute addressing unique archeological resources. It establishes limitations on analysis and prohibits imposition of mitigation measures for impacts to archeological resources that are not unique (PRC Section 21083.2).

The statute also provides a definition of unique archeological resources. The CEQA Guidelines do, however, state that this prohibition does not apply when an archeological resource has already met the definition of a historic resource (California Code of Regulations Section 15064.5). Since staff has determined that the site for which it is recommending mitigation does meet the definition of historical resource, the prohibition does not apply to the mitigation discussed in this Staff Assessment.

IMPACTS

Since project development and construction usually entail surface and subsurface disturbance of the ground, the proposed MLPP project has the potential to adversely affect a known cultural resource, prehistoric site CA-MNT-229 and previously unknown cultural resources.

PROJECT SPECIFIC IMPACTS

Project related effects may be categorized in several, interrelated ways. Effects to the cultural resource may either be temporary or permanent effects that could be associated with site preparation, project construction, project operation, and/or project closure. Project related effects may also result either directly or indirectly during the preconstruction, construction, operation, and/or closure of the project. A project may also have an effect that must be considered as part of an overall, cumulative perspective. At the MLPP project, earth disturbance activities could affect previously undiscovered resources, as well as recorded site CA-MNT-229.

Often the potential for project related construction activities to impact previously unknown cultural resources cannot be fully evaluated until the subsurface soils are exposed by grading, excavation, trenching, and/or augering. However, a determination 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 prehistoric site CA-MNT-229 within the APE, the number of recorded prehistoric sites in the vicinity of the APE, and the evidence for human habitation over a period of thousands of years, indicate that construction of the proposed project has the potential to encounter previously known and unknown cultural resources.

POTENTIAL FOR ADVER SE CHANGES TO HISTORIC RESOURCES

Based on NEPA, the Warren-Alquist Act, and the Energy Commission Siting Regulations, the Energy Commission staff must evaluate the potential for significant impacts to cultural resources. Based on CEQA, the Energy Commission staff must evaluate the potential for adverse changes in the significance of historic resources. The AFC indicates that prehistoric site CA-MNT-229 is within the APE and seven other prehistoric sites are within one kilometer of the APE, suggesting that there may be additional previously unrecorded sites within the boundaries of the APE.

The traveling screens will be relocated to the western edge of CA-MNT-229, where the intake structure for units 1 through 5 is now situated. This area was previously disturbed during the installation of the intake structure. Installation of the traveling

screens should not affect CA-MNT-229 because the intake structure is already in place, and the machinery required for the installation will be confined to areas presently covered with asphalt. The machinery used for modification and construction of the traveling screens and intake structures will be typical construction equipment such as backhoes, excavators, front-end loaders and cranes (Duke Energy 1999c). Staff has included conditions that stipulate cultural resource monitoring in this area.

Generating units 1 through 5 will be replaced with two 530-MW high efficiency combined-cycle units. Units 6 and 7 will be upgraded by 15MW each. These tasks should not affect any cultural resources because no ground will be disturbed during these efforts.

Eight 225 foot tall stacks that were previously used for the retired units 1 through 5 will be dismantled. This task will involve ground disturbance, and therefore, potential effects to as yet unrecorded cultural resources.

CUMULATIVE IMPACTS

According to CEQA Guidelines, cumulative impacts are associated with the construction and operation of other 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.

In addition to the MLPP project, Duke Energy has two other planned activities: demolition of onsite fuel storage tanks, and the Selective Catalytic Reduction (SCR) installation for units 6 and 7. Portions of these modernization activities may occur concurrently with the MLPP project. Like the project, these other modernization activities will be performed entirely within the confines of the existing industrial power plant property.

Tank demolition and removal will be permitted by the County of Monterey. The cultural section of the AFC, page 6.7-8 recommends cultural resources monitoring during removal, preconstruction and construction activities in the area of tanks #3, #4, and #10. The AFC also recommends cultural resources monitoring during any activity that disturbs the soil under tank #10. Staff discussed these concerns with Monterey County and was assured by Planner, Bud Carney that a condition would be written in Monterey County s permit to address these areas identified by the applicant. Therefore, no cumulative impacts to cultural resources will occur as a result of the tank demolition, SCR installation, and the MLPP project. There are several offsite land development projects in the vicinity of MLPP. Since these projects are located offsite, they have no bearing on the project s cultural resource impacts (Duke Energy 1999a, page 6.7-8).

PLANNED PERMANENT CLOSURE

A planned permanent closure occurs when the facility is closed in a planned, orderly manner, such as at the end of its useful economic or mechanical life or due to unfavorable economic conditions. In general, decommissioning activities for the

facility will attempt to maximize the recycling of all facility components. The site will be secured 24 hours per day during the decommissioning activities (Duke Energy 1999a, pages 4-1, 4-3, and 4-4).

Planned permanent closure may impact cultural resources, particularly CA-MNT-229, a NRHP eligible site. The exposed portions of the site should be fenced prior to decommissioning activities, and remain fenced until all decommissioning activities are complete. Activity planned for the area, following the closure, will determine whether the fencing remains in place or is removed.

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 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 structure 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 PERMANENT CLOSURE

Unexpected permanent closure occurs if the owner unexpectedly closes the facility permanently or suddenly while the owner is implementing an outside contingency plan or when the project owner has abandoned the project. In the event of an unexpected permanent facility closure, Duke Energy will follow the procedures outlined in the onsite contingency plan to assure that the appropriate steps to mitigate public health and safety and environmental concerns are taken in a timely manner. The Energy Commission s compliance unit and other responsible agencies will be notified. The Energy Commission will be informed of the status of closure activities (Duke Energy 1999a, pages 4-1 and 4-4).

Unexpected permanent closure may impact cultural resources, particularly CA-MNT-229, a NRHP eligible site. The exposed portions of the site should be fenced prior to decommissioning activities, and remain fenced until the all decommissioning activities are complete. Activity planned for the area following the closure, will determine whether the fencing remains in place or is removed.

MITIGATION

The AFC indicates that prehistoric site CA-MNT-229 is within the APE. In addition, there are seven other prehistoric sites in the vicinity of the MLPP (Duke Energy 1999a page 6.7-5). The presence of CA-MNT-229 within the APE, the preponderance of prehistoric sites in the vicinity of the APE, and the fact that the MLPP was not surveyed for archaeological remains prior to its construction in the late 1940s, indicate that there may be additional previously unrecorded archaeological sites within the boundaries of the MLPP. Since project

implementation will involve ground disturbance in several areas, there is potential for the project to impact as yet unknown archaeological resources.

The preferred mitigation for impacts to cultural resources is avoidance of the resource. If previously unknown cultural resources are encountered during project related ground disturbance activities, and they cannot be avoided, then contingency measures must be in place to protect these resources. 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.

Mitigation measures are developed to reduce the potential for adverse impacts to cultural resources within the APE to a less than significant level. Staff has recommended a series of conditions of certification that would help ensure the mitigation of project impacts. The proposed conditions are presented 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 U.S. Secretary of the Interior guidelines, and Energy 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, prehistoric site CA-MNT-229, a NRHP eligible site, is located within the APE, in the northwest portion of Area 1. Project plans for that area do not involve any ground disturbance activities, so direct impacts to the site are not expected. Further, equipment that will be used to install the new traveling screens will be accommodated by existing asphalt capped areas. There should be no need for any vehicular or pedestrian traffic to come in contact with exposed areas of the site. However, to ensure that CA-MNT-229 is not accidentally impacted, all exposed portions of the site should be fenced prior to project related activities of any sort.

In Section 6.7.3 of the AFC, the applicant presents the statement, Based on the above analysis of impacts [6.7.2.4 Project Design Features] and the design features that have been incorporated into the Project, no mitigation measures are required. The AFC does provide measures, however, in the event previously unrecorded cultural resources are encountered during construction. These proposed measures are to be incorporated into the Cultural Resource Monitoring and Mitigation Plan to

be prepared, as described in the proposed conditions of certification. The measures are as follows:

- An archaeological monitor shall be present during construction or preconstruction activities that involve moving the soils of the berms around Fuel Tanks 3, 4 and 10 or the soils beneath the enclosure of Fuel Tank 10.

- An archaeological monitor shall be present during construction activities in the northwest corner of MLPP that have the potential to cause incidental impacts to areas in the vicinity of CA-MNT-229. If human remains or intact cultural features are discovered in context during these activities, work shall be halted within the immediate area of the find until it can be evaluated by the monitor, and appropriate mitigation measures are formulated and implemented.

- Prior to the start of construction activities for the units 1 through 5 intake structure and associated piping, the construction crew shall be informed of the general location of site CA-MNT-229, and shall be directed to avoid encroaching on the site with heavy equipment, foot or vehicular traffic, construction materials, and demolition stockpiles. Appropriate protection (i.e., fencing) shall be provided for this site during construction.

- The following standard language or an equivalent, shall be included in any permits issued within the project area: If archaeological resources or human remains are discovered during construction, work shall be halted within the immediate area of the find until it can be evaluated by a qualified professional archaeologist. If the find is determined to be significant, appropriate mitigation measures shall be formulated and implemented.

- The AFC concludes that implementation of the Project design features noted above will assure that known cultural resources are avoided. They will also provide for identification and, if warranted, recovery and treatment of unknown cultural resources discovered during construction. As a result, no significant unavoidable adverse impacts to cultural resources are expected (Duke Energy 1999a, pages 6.7-8 and 6.7-9).

In addition to the mitigation measures outlined in the AFC, the archaeological consultant to the applicant made further specific recommendations which follow:

- No construction related activities with any potential for subsurface impacts should be planned within the National Register eligible archaeological site, CA-MNT-229. Section 106 requirements for testing and mitigation would be necessitated by any planned impacts to this site.

- An archaeological monitor should be present during construction and pre-construction activities that involve moving the soils of the berms in Areas 4 and 5 or the soils beneath the enclosure of tank #10. An archaeological monitor should also be present during construction activities in Area 1 which have the potential to cause incidental impacts to the cultural soils of CA-MNT-229. If human remains or intact cultural features are discovered during these activities,

work shall be halted within 50 meters (150 feet) of the find until it can be evaluated by the monitor, and appropriate mitigation measures formulated and implemented. Artifactual materials discovered in a previously disturbed context will be recovered for appropriate analysis and curation.

If a portion of the existing 54-inch discharge lines can be used in place, the extent of excavation to cut these lines and connect the new 84-inch cooling water main would be approximately 40 feet by 100 feet by 12 feet deep, beginning at a point about 130 feet east of the existing pumpwell and extending further east. If the existing piping is not reused, the excavated area for the new pump discharge lines and tie-ins to the new 84-inch main would affect an area of about 40 feet by 100 feet by 12 feet deep, beginning immediately east of the pumpwell structure and extending to the east.

Two excavated trenches, approximately 20 feet to 60 feet wide (depending on construction technique) by 12 feet deep, will be required to install the new 84-inch cooling water supply and return lines. One trench, which will contain the 84-inch supply line, will extend from the location of the tie-ins with the 54-inch pump discharge lines to the new units. The second trench, for the two new return lines, will extend from the point where the return line goes underground to the existing units 6 and 7 discharge system.

For the above mentioned trenches, excavation that takes place within previously undisturbed sediments should be monitored by a qualified archaeologist. Excavation within areas of fill does not need to be monitored. If it cannot be determined whether excavation is within fill or previously undisturbed sediments, then a qualified archaeological monitor should be present.
A new approximately 1500-foot long and 14-inch diameter natural gas line will be installed between existing connections. The trench for the gas line will be about 20 inches wide and 5 feet deep. Trenching will be accomplished with a trencher or a backhoe, the latter often being used to lower pipe into the trench. The lay down/staging areas will be located next to tanks #3 and #4, and will be approximately 40,000 square feet. A qualified archaeological monitor should be present during excavation for the new gas line.

STAFF S PROPOSED MITIGATION MEASURES

Energy Commission staff concurs with the mitigation measures proposed by the applicant and the archaeological consultant 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. Adoption of staff s proposed conditions of certification is expected to reduce the potential for adverse project impacts on the region s cultural resources.

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 U.S. Secretary of the Interior s guidelines, and staff s recommendations. The mitigation

measures set forth in the conditions have been applied to previous projects where resources were subject to construction related impacts, allowing the timely completion of many projects throughout California.

If any previously unspecified ground disturbance activities, such as trenching, should occur, a qualified archaeological monitor should be present. If intact cultural features are discovered during these activities, work shall be halted within 50 meters (150 feet) of the find until it can be evaluated by the monitor, and appropriate mitigation measures formulated and implemented. Artifactual materials discovered in a previously disturbed or undisturbed context will be recovered for appropriate analysis and curation.

Staff recommends that any as yet unknown sites that may still retain integrity and for which significance has not been formally assessed, will, until a determination of significance can be made, be presumed to be significant and potentially eligible for listing on the NRHP per 36 CFR 60.4(d).

MITIGATION OF INDIRECT IMPACTS

According to CEQA Guidelines, indirect impacts are caused by the project, but they may occur at a later time or place. For cultural resources, indirect impacts may result from increased erosion due to site clearance and preparation or the destabilization of slopes. Impacts may also occur if heavy equipment, foot or vehicular traffic, construction materials or stockpiles are allowed to encroach onto the site. Project related improvements in access areas to sensitive resources may lead to inadvertent damage or outright vandalism to exposed resource materials. However, if site avoidance, fencing, and worker education are conducted according to the conditions of certification, impacts should not occur.

UNEXPECTED TEMPORARY CLOSURE

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly and on a short-term basis, due to unplanned circumstances such as a natural disaster, economic conditions, or other unexpected event or emergency. For short term unexpected closure that does not involve facility damage resulting in hazardous substance release, the facility would be kept as is and ready for restart when the unexpected closure event is rectified or ceases to restrict operations. If there is a possibility of hazardous substances release, the Energy Commission s compliance unit will be notified, and procedures will be followed as set forth in the MLPP project Risk Management Plan (Duke Energy 1999a, page 4-1, 4-2)

Unexpected temporary closure would not directly affect cultural resources. However, while the facility is non-operational and personnel numbers have been reduced, there is the possibility of vandalism on the premises. To prevent vandalism to CA-MNT-229, a NRHP eligible site, the exposed portions of the prehistoric site should be fenced

CONCLUSIONS AND RECOMMENDATION

CONCLUSIONS

There is one site, CA-MNT-229 within the project APE that has been determined eligible for the NRHP. There is a total of eight recorded prehistoric cultural resource sites within the project vicinity. LORS requiring archaeological surveys were not in place prior to the construction of the MLPP, it is possible that previously unrecorded prehistoric archaeological sites may be within the boundaries of the MLPP, and specifically the APE. These potentially present sites have not been evaluated for eligibility to the NRHP. Therefore, to minimize potential impacts to 1) a cultural resource that has been determined eligible for the NRHP (CA-MNT-229) and 2) potentially present sites that have not yet been evaluated for eligibility to the NRHP, the following shall apply:

Under CEQA, the Energy Commission is 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 site described in the AFC and in the confidential technical reports meets one or more of the criteria needed to identify it as an historic resource. Staff has reviewed the discussions of the materials recorded at the known site found within the APE. Staff has reviewed the recommendations of the applicant s archaeological specialist and has incorporated them into the proposed conditions of certification.

Staff has incorporated the various cultural resources mitigation measures into a proposed set of conditions of certification for the MLPP project. The cultural resources conditions of certification are presented as a means of anticipating potential impacts directly associated with the MLPP and they are expected to reduce any potential for adverse impacts to historic resources to a less than significant level.

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.

Staff believes that construction of the MLPP project can be accomplished in a manner that can avoid potential adverse changes to the significance of the known historic resource. The potential for adverse changes to as yet undiscovered additional historic 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 in a timely and proper manner, the project will be in compliance with the applicable LORS.

RECOMMENDATIONS

Staff recommends that the Energy Commission make the appropriate finding regarding site CA-MNT-229, and adopt the following proposed conditions of

certification, to ensure mitigation of potential impacts to sensitive cultural resources during the earth disturbing activities and construction of the MLPP project.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of project related earth disturbing activities, vegetation clearance, ground disturbance and preparation, site excavation activities, or the movement or parking of heavy equipment or other vehicles on or over the project surface, the project owner shall provide the 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.

The statement of qualification for the designated cultural resource specialist shall include all information needed to demonstrate that the specialist meets the minimum qualifications listed as follows:

1. a graduate degree in anthropology, archaeology, California history, cultural resource management, or a comparable field;
2. at least three years of archaeological resource mitigation and field experience in California; and
3. at least one year experience in each of the following areas:
   a. leading archaeological resource field surveys;
   b. leading site and artifact mapping, recording, and recovery operations;
   c. marshaling and use of equipment necessary for cultural resource recovery and testing;
   d. preparing recovered materials for analysis and identification;
   e. determining the need for appropriate sampling and/or testing in the field and in the lab;
   f. directing the analyses of mapped materials; and recovered artifacts;
   g. completing the identification and inventory of recovered cultural resource preparing appropriate reports to be filed with the receiving curation repository, the SHPO, and the appropriate regional archaeological information center.

The statement of qualifications for the designated cultural resource specialist shall include:

1. a list of specific projects on which the specialist has previously worked;
2. the role and responsibilities of the specialist for each project listed; and
3. the names and phone numbers of contacts familiar with the specialist s work on these referenced projects.

Verification: At least ninety (90) days prior to the start of earth disturbing activities, 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 earth disturbing activities, the project owner shall confirm in writing to the CPM that the approved designated cultural resource specialist 1) will be available at the start of earth disturbing activities and 2) 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 r sum of the proposed new designated cultural resource specialist.

CUL-2 Prior to the start of earth disturbing activities, the designated cultural resource specialist and the CPM will be provided with maps and drawings issued for the construction site plan and site layout and for the final alignment of any linear facilities. Maps provided will include the USGS Moss Landing 7.5-minute topographic quadrangle map and a map at an appropriate scale (i.e., 1:2000 or 1 = 200) for plotting individual artifacts. Maps shall show the following:

The location of all areas where surface disturbance may be associated with project-related access roads, and any other project components.

Verification: At least seventy-five (75) days prior to the start of earth disturbing activities on the project, the project owner shall provide the designated cultural resource specialist and the CPM with final drawings and site layouts for all project facilities and for all areas potentially affected by project earth disturbing activities or project construction, on the USGS Moss Landing 7.5 topographic quadrangle map and on a map at a scale of 1:2000 or 1 = 200. If the designated cultural resource specialist requests enlargements or strip maps for linear facility routes, the project owner shall provide them. In addition, the project owner shall provide a set of these maps to the CPM at the same time that they are provided to the specialist.

CUL- 3 Prior to the start of any earth disturbing activities, the designated cultural resource 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 CRMMP 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: mapping, data and artifact recovery

conducted during monitoring and mitigation activities, and post-construction analysis of recovered data and materials.

b. A discussion of the implementation sequence and the estimated time frames needed to accomplish all project related tasks during the preconstruction, 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 need for Native American observers or monitors, the procedures to be used to select them, the areas or post-mile sections where they will be needed, and their role and responsibilities

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 in Title 36 of CFR Part 79.

h. A discussion of the availability and the designated specialist s access to equipment and supplies necessary for site mapping, photographing, and recovery of any cultural resource materials encountered during construction.

i. Identification of the public institution that has agreed to receive any data and artifacts 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 earth disturbing activities, the project owner shall provide the Cultural Resource Monitoring and Mitigation Plan, prepared by the designated cultural resource specialist, to the CPM for review and written approval.

CUL-4 Prior to the start of any earth disturbing activities, the designated cultural resource specialist shall prepare an employee training program. The project owner shall submit the cultural resource training program to the CPM for review and written approval.

Protocol: The training program shall discuss the potential to encounter cultural resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training program shall also include the set of resource reporting procedures and work curtailment procedures that workers are to follow if previously unknown cultural resources are encountered during project activities. The training program shall be presented by the designated cultural resource specialist or qualified individual(s) approved by the CPM and may be combined with other training programs prepared for biological resources, paleontological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least sixty (60) days prior to the start of earth disturbing activities on the project, the project owner shall submit to the CPM for review and written approval, the proposed employee training program, the set of reporting procedures, and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during construction. The project owner shall provide the name and r sum of the individual(s) performing the training.

CUL-5 Prior to the start of earth disturbing activities and throughout project construction, 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 1) the CPM approved set of procedures for reporting any cultural resources that may be discovered during project related ground disturbance, and 2) the work curtailment procedures that the workers are to follow, in the event previously unknown cultural resources are encountered during construction.

Verification: Within seven (7) days after the start of earth disturbing activities, the project owner shall provide the CPM with documentation that the designated cultural resources trainer(s) has/have provided the CPM approved cultural

resources training, and the set of reporting and work curtailment procedures, to all project managers, construction supervisors, and workers hired before the start of earth disturbing activities.

In each Monthly Compliance Report after the start of construction, the project owner shall provide the CPM with documentation that the designated cultural resource trainer(s) has/have provided to all project managers, construction supervisors and construction workers 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-6 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:

a. The designated cultural resource specialist has notified the CPM of the find and the work stoppage;

b. The specialist, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed; and

c. Any necessary data recovery and mitigation has been completed.

The designated cultural resources specialist, the project owner, and the CPM shall confer within five working days of the notification of the CPM to determine what, if any, data recovery or other mitigation is needed.

If data recovery or other mitigation measures are required, the designated cultural resource specialist and team members shall monitor 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 earth disturbing activities, the project owner shall provide the CPM with a letter confirming that the designated cultural resource specialist and delegated monitor(s) has/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 as soon as possible.

For any cultural resource encountered that the specialist determines is not significant, the project owner shall include information regarding this determination in the next Monthly Compliance Report.

CUL-7 Prior to the start of earth disturbing activities and each week throughout the period involving any ground disturbing activities, including landscaping, the project owner shall provide the designated cultural resource specialist 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 resource 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: Ten (10) days prior to the start of earth disturbing activities and in each MCR thereafter, the project owner shall provide the CPM with a copy of the weekly schedule of the construction activities, as well as maps, showing where construction activity was to take place. The project owner shall notify the CPM when all ground disturbing activities, including landscaping, are completed.

CUL-8 Throughout earth disturbance, reconnaissance surveys and the construction monitoring and mitigation phases of the project, the designated cultural resource specialist and delegated monitor(s) shall keep a daily log of any resource finds and the progress or status of the resource monitoring, mitigation, preparation, identification, and analytical work being conducted for the project. The daily logs shall indicate where and when monitoring has taken place, where monitoring has been deemed unnecessary, and where cultural resources were found. Locations shall be keyed into both the USGS Moss Landing 7.5 topographic quadrangle map and the lager scale (1:2000 or 1 =200) map.

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 Energy Commission technical staff.

Verification: Throughout the project construction period, 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 included in the Monthly Compliance Report to the CPM.

CUL-9 The designated cultural resource specialist or delegated monitor(s) shall be present at times the specialist deems appropriate to monitor construction related grading, excavation, trenching, and/or augering in the vicinity of

previously recorded archaeological sites and in areas where ground disturbance is taking place.

In addition to areas identified by the cultural resource specialist, monitoring shall take place in the following locations:

The area of the intake structure, located on the east side of Moss Landing Harbor, is now separated from areas on both the north and south by a chain link fence. If there is any reason to extend project activities (whether or not earth is disturbed) to the other side of the fence, monitoring shall be required.

Installation of both 54 inch and 84 inch new pipes is planned. Monitoring shall be required where the depth of the trench exceeds the depth of previous earth disturbance.

Monitoring shall be required during earth disturbance related to the installation of the new natural gas line.

Protocol: Except in the areas where monitoring is required by these conditions, if the designated cultural resource specialist determines that full time monitoring is not necessary in certain portions of the project area, the designated specialist shall notify the project owner of the changes. Evidence of monitoring activities shall be recorded in the daily log and provided in the monthly compliance report. The designated cultural resource specialist shall also record in the daily log the areas where monitoring is being reduced or is no longer deemed necessary.

Verification: Throughout project construction, the project owner shall include in the Monthly Compliance Reports to the CPM, copies of the weekly summary reports prepared by the designated cultural resource specialist, regarding project related cultural resource monitoring.

CUL-12 The project owner shall ensure that the designated cultural resource specialist performs the recovery, preparation for analysis, analysis, preparation for curation, and delivery for curation of all cultural resource materials encountered and collected during preconstruction 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 museum(s), university (ies), or other appropriate research facility that 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 sites shall be kept confidential and accessible only to qualified cultural resource specialists.

CUL-13 Following completion of data recovery and site mitigation work, the project owner shall ensure that the designated cultural resource specialist prepares a proposed scope of work for the cultural resources report. The project owner shall submit the proposed scope of work to the CPM for review and written approval.

Protocol: The proposed scope of work shall include (but not be limited to):

a. A discussion of any analysis to be conducted on recovered cultural resource materials;

b. A 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.

The project owner shall ensure that the cultural resources report that is prepared by the designated cultural resource specialist at the conclusion of the project, follows the format provided by the California Office of Historic Preservation.

Verification: The proposed scope of work shall be completed 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-14 If human remains are encountered, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to PRC Section 5097.98. The County Coroner must be notified of the find immediately.

Verification: In the event human remains (or any bone material that cannot be positively identified as non-human by the monitor) are found, the monitor and the cultural resource specialist shall immediately notify the project owner and assist in following proper protocol, as prescribed by law. The CPM shall be notified of the find within 72 hours.

Cul-15 The project owner shall ensure that the designated cultural resource 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:

For all projects:

1. A description of pre-project literature search, surveys, and any testing activities;
2. Maps showing areas surveyed or tested;
3. A description of any monitoring activities;
4. Maps of any areas monitored; and
5. Conclusions and recommendations.

For projects in which cultural resources were encountered, include the items specified above and also provide:

a. site and isolate records and maps;
b. a description of testing for, and determinations of, significance and potential eligibility; and
c. a discussion of the research questions answered or raised by the data from the project.

For projects regarding which cultural resources were recovered, include the items specified above and also provide:

- 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; 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 specialist 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, or a computer disc copy of the CPM-approved Cultural Resource Report to the public repository to receive the recovered data and materials for curation, to the SHPO, 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 shall include the following (based on the applicable scenario set forth in CUL-15:

a. 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 preconstruction 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, and the appropriate archaeological information center(s).

For the life of the project, the project owner shall maintain in its compliance files copies of all documentation related to the filing of the CPM approved Cultural Resources Report with the public repository receiving the recovered data and materials for curation, the SHPO, and the appropriate archaeological information center.

CUL-17 Following the filing of the CPM approved Cultural Resources Report with the appropriate entities, the project owner shall ensure that all cultural resource materials, maps, and data collected during data recovery and mitigation for the project, are delivered to a public repository that meets the U.S. Secretary of Interior requirements for the curation of cultural resources. The project owner shall pay the curation fee required by the repository.

Verification: 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.

ACRONYMS

AFC: Application for Certification
APE: Area of Potential Effects
B.P.: Before Present (1950)
CEQA: California Environmental Quality Act
CFR: Code of Federal Regulations
CPM: Compliance Project Manager
CRMMP: Cultural Monitoring and Mitigation Plan
Duke Energy: Duke Energy Power Services
EIR: Environmental Impact Report

Energy Commission: California Energy Commission
LORS: Laws, Ordinances, Regulations and Standards
MCR: Monthly Compliance Report
MLPP: Moss Landing Power Plant
NAHC: Native American Heritage Commission
NEPA: National Environmental Policy Act
NRHP: National Register of Historic Places
PG&E: Pacific Gas & Electric Company
PRC: Public Resources Code
Section 106: Section 106 of the National Historic Preservation Act
TRC: TRC Environmental Solutions, Inc.

REFERENCES

Abbott, Steve, Scott Flake, and Rex Lewis. 1998. A Report on the Socioeconomic Impact of Major Construction Activities at Moss Landing Power Plant. Prepared for Duke Energy Power Services.

Dietz, Stephen A., William Hildebrandt and Terry Jones. 1988. Archaeological Investigations at Elkhorn Slough: CA-MNT-229, A Middle Period Site on the Central California Coast. Northern California Anthropological Group, Berkeley, California.

Dondero, Steven B., Daryl Noble, Janis Offermann, and Terrence Schuster. 1984. Preliminary Report on Archaeological Testing, CA-MNT-229, Elkhorn Slough, Monterey County, California, 5-MON-1, P.M. 96.2/96.8, 05201-238301. Office of Environmental Analysis, Division of Project Development, California Department of Transportation, Sacramento, California.

Doane Mary B., and Gary S. Breschini. 1999b. Addendum to the Preliminary Archaeological Reconnaissance of the Moss Landing Power Plant, Moss Landing, Monterey County, California. Prepared for TRC Walnut Creek, California

Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.

Duke Energy. 1999b. Various confidential filings, cultural resources . Submitted to the Energy Commission, May 7, 1999.

Duke Energy. 1999c. Data Adequacy Supplemental filing, dated July 30, 1999.

Duke Energy. 1999d. First set of Data Responses 1-24, Submitted to the Energy Commission October 4, 1999.

Duke Energy. 1999e. Second set of Data Responses 24-???, dated November 22, 1999

Monterey County. 1982a. Monterey County General Plan, 1882.

Monterey County. 1982b. North County Land Use Plan, 1982 (amended May 19, 1987).

Peak, Ann S. & Associates. 1979. Archaeological Test Excavations of CA-MNT-228 and CA-MNT-229, Moss Landing, Monterey County, California. Ms. on file at the North-west Information Center, File Number S-4880.

Urbas, Andr a. 1999. Historic Resource Evaluation Report/Historic Architectural Survey Report for the Monterey County Bridge Replacement Project, Sandholdt Road Bridge over Moss Landing Slough, State Br. No. 44C-0108; County Br. No. 112, Moss Landing, Monterey County, California. Report prepared as a subconsultant to LSA Associates, Inc. for Caltrans District 5, San Luis Obispo, 05-MON-County Road.

SOCIOECONOMIC RESOURCES

Amanda Stennick

INTRODUCTION

Socioeconomic Resources encompasses several related areas of interest and concern. A typical socioeconomic impact analysis evaluates the effects of project-related population changes on local schools, medical and protective services, public utilities and other public services, the fiscal and physical capability of local governmental agencies to meet the needs of project-related changes in population, and the issue of environmental justice. This analysis discusses the potential effects of the proposed Moss Landing Power Plant Project (MLPPP) on local communities, community resources, and public services, pursuant to Title 14 California Code of Regulations, Section 15131.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

CALIFORNIA GOVERNMENT CODE, SECTION 65995-65997

Senate Bill 50 and other statutory amendments enacted in 1998 provide that, notwithstanding any other provisions of local or state law (including CEQA), state and local agencies may not require mitigation for the development of real property for effects on school enrollment except as provided by new provisions in the Government Code. (Govt. Code, Sec. 65996(a).) The relevant provisions restrict fees for the development of commercial and industrial space to the $0.31 per square foot of "chargeable covered and enclosed space." (Govt. Code, Sec. 65995(b)(2).)

ENVIRONMENTAL JUSTICE

President Clinton s Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations was signed on February 11, 1994. The order required the US Environmental Protection Agency (USEPA) and all other federal agencies to develop environmental justice strategies. The USEPA subsequently issued Guidelines that require all federal agencies and state agencies receiving federal funds, to develop strategies to address this problem. The agencies are required to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations.

SETTING

PROJECT LOCATION

The project site is located twelve miles north of Salinas in unincorporated Monterey County. The project is situated within the property boundary of the existing Moss Landing Power Plant Project. Moss Landing Power Plant Project has defined the

socioeconomic study area as a maximum reasonable commuting distance of about 90 minutes one-way commute for construction workers and operating employees. However, for purposes of determining construction worker availability and operation employees, staff considers the study area to consist of Monterey, Santa Cruz, and San Benito Counties. Although some project-generated economic benefits will occur throughout the entire three-county area, because the project is located in Monterey County, staff expects that Monterey County will receive the majority of the socioeconomic and fiscal impacts of the project.

IMPACTS

Staff reviewed the Moss Landing AFC, Vol. I, May 1999, executive summary, socioeconomic, and project description sections regarding potential impacts to community services and infrastructure (employment, housing, schools, utilities, emergency and other services), and environmental justice. Staff also reviewed the November 22, 1999 Supplemental Filing. Based on its independent analysis and the MLPPP socioeconomic data provided and referenced from governmental agencies and trade associations, staff finds the project will not have a direct impact on socioeconomic resources. However, analysis of the project s impact on worker safety and fire protection determined that the project will have a direct impact on fire services in the North County Fire Protection District. Please refer to **Worker Safety** for a discussion of the impact and proposed condition of certification.

Staff s criteria for assessing socioeconomic impacts are based on impacts to existing levels of service for medical services, law enforcement, fire and emergency services, and housing. Determination of impact is based on input from local agencies and service personnel. Environmental justice has a numeric threshold of 50 percent when determining the presence of minority and low-income populations. Regarding potential impacts to schools, public agencies may not impose fees, charges or other financial requirements to offset the cost for school facilities. Therefore, any project-related revenues to school districts can be imposed only through property taxes and statutory facility fees collected at the time the building permit is acquired.

CONSTRUCTION EMPLOYMENT AND PROJECT SCHEDULE

Figure 6.10-2 in the Supplementary Filing shows the workforce loading for project construction. Figure 6.10-2 indicates that project construction will occur over a 26-month period, with an average of 234 construction workers on site, and a maximum of 732 workers on site during peak construction. As indicated by Figure 6.10-2, peak construction is expected to last about four months. Specific trades required for construction include carpenters, laborers, ironworkers, operators, pipefitters, electricians, millwrights, boilermakers, insulators, painters, and teamsters. Based on employment information provided by Monterey County Building and Construction Trades (Table 6.10-9 in the AFC; Gonzales 1999), there appears to be a considerable surplus of construction workers available to staff the construction of the project. Mr. Gonzales of the Building and Construction Trades of Monterey and Santa Cruz Counties, indicated that the construction workforce is comprised of

workers from Monterey, Santa Cruz, and San Benito Counties. Therefore, no temporary or permanent relocation of workers is necessary for project construction.

PROJECT OPERATION

There are currently 88 people employed at the MLPPP. Table 6.10-10 in the AFC shows the current number and location of residence of each employee. Post-construction project operation is expected to create about ten new jobs (Duke Energy 1999a). The applicant assumes that the distribution of residences of new employees would be the same as for existing employees. However, the applicant does not know whether the ten new employees would be hired from the study area or hired from outside the region. Assuming worst-case, all ten employees would relocate to the study area and their location of residence would be similar to existing employees. Therefore, potentially ten new households would be created by the project. Based on the current distribution of MLPPP employees, seven households would locate in Monterey County, two would locate in Santa Cruz County, and one would locate in San Benito County.

Information obtained from the Association of Monterey Bay Area Governments (AMBAG) indicates that average household size varies by county for the tri-county area (Monterey 3.168; Santa Cruz 2.783; San Benito 3.159). Based on the average household sizes for each county, it is reasonable to assume that each worker who relocates to the area would have two dependents.

HOUSING

Housing characteristics provided in Table 6.10-5 of the AFC (State of California Department of Finance, City/County Population and Housing Estimates) give the number of housing units, vacancy rates, and number of vacant units for all cities and unincorporated communities in the four-county study area. Vacancy rates range from a low of 3.5 percent in Salinas to a high of 27.6 percent in Marina. Monterey County has an overall vacancy rate of 10.37 percent; Santa Cruz County has an overall vacancy rate of 8.99 percent. In addition to housing units, as of October 1997, there were about 12,100 motel/hotel rooms in Monterey County (Duke Energy 1999a). The applicant expects that hiring of construction workers will occur within the three-county project area. Therefore the potential demand for housing during construction is expected to be minimal to non-existent. Any potential demand for housing as a result of project construction can be accommodated by the existing vacancy rates in the cities and communities within the study area; any weekly-commuting construction workers can be accommodated by existing motel/hotel rooms in Monterey County. As stated above, ten new households with three persons per household may be created by the project. Based on housing characteristics in Table 6.10-5 in the AFC, the potential addition of ten new households in the study area does not represent a significant impact to housing.

SCHOOLS

The school district where development will occur is North Monterey County Unified School District. The North Monterey County Unified School District assesses developer fees of $0.31 per square foot for commercial or industrial development (Duke Energy 1999d). MLPPP states that the project will total an estimated 10,197

square feet. Therefore, the MLPPP will be assessed a one-time developer fee of $3,161. Developer fees can be spent on both temporary and permanent construction and on offices, multipurpose rooms, bathrooms, and other facilities, and transportation as well as classrooms. There is no way to determine which schools within the North Monterey County Unified School District will receive the fees or how they will be spent.

For this analysis, staff assumes that all dependents other than spouses will be school-aged children. Assuming that hiring of new employees will occur from outside the area, ten new employees with dependents will relocate to the study area in a similar locational pattern as existing employees. Therefore, staff estimates that ten children will attend schools in school districts in Salinas (seven school districts), Santa Cruz (four school districts) or Watsonville (one school district), and Hollister (five districts).

Table 6.10-7 in the AFC shows the school districts in the study area. In Salinas, three school districts are at capacity, three are under capacity, and no information is available for the other district; in Santa Cruz, one district is at capacity; in Watsonville information is not available for Pajaro Valley Unified School District; in Hollister, four school districts are under capacity; information is unavailable for the other district. From the school district information provided by the applicant and staff s independent analysis, staff finds that the potential of ten new students in the study area school districts will not constitute a significant impact.

MLPPP expects to hire construction workers from within the study area, and therefore does not expect construction workers and their families to relocate for the duration of the construction period. Staff s independent analysis on worker availability concurs with the findings of the applicant s, and staff does not expect any project-related adverse effects to the affected school districts as a result of project construction or operation. In addition, Senate Bill 50, signed by Governor Wilson on August 27, 1998, amended section 17620 of the Education code, and restricts school funding to property taxes and statutory facility fees collected at the time the building permit is acquired. Public agencies may not impose fees, charges or other financial requirements to offset the cost for school facilities . School facilities are defined as any school-related consideration relating to a school district s ability to accommodate enrollment. Therefore, any project-related revenues to school districts can be imposed only through property taxes and statutory facility fees collected at the time the building permit is acquired.

PUBLIC SERVICES

COMMUNITY PROTECTIVE SERVICES

The project is served by the Monterey County Sheriff s Department. The Department will not require expansion or increase in staffing to accommodate project construction or operation (Brassfield1999).

Fire protection and emergency response to the project is provided by the North County Fire Protection District Station One, located in Castroville, about 3 miles southeast of the MLPPP. District Station Three, located in Las Lomas about 7 miles

west of the project site, would provide back-up support. These stations have first responder HAZMAT capabilities. In addition, air ambulance services are available and coordinated through the North County Fire Protection District. Please refer to the section on **Worker Safety** for a discussion of existing equipment and personnel at each station.

Staff s review of District Chief Pereira s 1/10/00 letter and review of the **Worker Safety** section indicates that the North County Fire Protection District (District) does not have a ladder truck in its inventory to provide the elevated stream fire suppression and rescue capabilities required for the project. As mitigation for the direct impacts to fire protection services, the District is proposing that MLPPP purchase a ladder truck that will be located at Station One and provide funds for additional trained staff. Condition of Certification **Worker Safety-4** provides the mechanism for funding for this impact.

COMMUNITY MEDICAL SERVICES

Ambulance service is currently provided by American Medical Responders who transport to the Salinas Valley Memorial Hospital in Salinas, or Watsonville Community Hospital in Watsonville. Staff does not anticipate that project construction will place a significant demand on American Medical Responders, the Salinas Valley Memorial Hospital, or Watsonville Community Hospital (Downing 2000).

UTILITIES, WASTE MANAGEMENT, HAZARDOUS WASTE, WATER DEMAND, WASTEWATER DISPOSAL

Utility services in the MLPPP area are provided by Pacific Gas and Electric (PG&E). Please refer to the sections on **WATER RESOURCES** and **WASTE MANAGEMENT** for detailed discussions of water supply, water quality, wastewater disposal, and solid waste disposal.

IMPACT ON FISCAL RESOURCES AND THE LOCAL ECONOMY

PROPERTY TAX

In April 1999, the Board of Equalization Property Tax Committee formally agreed to assess only those companies that own generation facilities with a Certificate of Public Convenience and Necessity (CPCN). A CPCN is issued by the California Public Utilities Commission for non-merchant power plants. The property of all other companies owning generation facilities and selling electricity to the public would be county assessed. Therefore, the MLPPP as with all merchant plants, will be assessed by the county where sited. The applicant estimates the capitol cost of the project to be between $400 and $500 million dollars, therefore, based on the countywide property tax rate of 1.0 percent, the project is expected to generate between $4 and $5 million in property taxes in Monterey County each year (Duke Energy 1999a). The revenue will be collected by Monterey County and distributed among 177 separate entities. About 47 percent is allocated to county school districts, 26 percent to the county general fund, 0.8 percent to hospitals, and 0.1 percent to Moss Landing Harbor District (Duke Energy, Monterey County Tax Collector s Office 1999).

LOCAL PURCHASING OF EQUIPMENT AND SUPPLIES

The estimated total construction payroll is about $136 million. The MLPPP estimates that local purchases of materials and supplies during construction would be about $11 million (Duke Energy 1999a). The cumulative MLPPP modernization will result in an estimated state sales tax increase from $19 to $22 million per year; the allocation to Monterey County will increase from about $2.0 to $2.5 million per year.

ENVIRONMENTAL JUSTICE SCREENING ANALYSIS

For all siting cases, Energy Commission staff follows the federal guidelines two-step screening process. The process assesses:

- whether the potentially affected community includes minority and/or low-income populations; and
- whether the environmental impacts are likely to fall disproportionately on minority and/or low-income members of the community.

Depending on the outcome of the screening process, local community groups are contacted to provide the Energy Commission with a fuller understanding of the community and the potential environmental justice issues. In addition, local community groups are asked to help identify potential mitigation measures.

EPA s April 1998 Guidance For Incorporating Environmental Justice Concerns In EPA s NEPA Compliance Analyses (Guidance) provides a numeric measure to determine the presence of an affected population: a minority population exists if the minority population percentage of the affected area is fifty percent or greater than the affected area s general population. The Guidance does not define the term affected area , however it states that the analyst should interpret the term as that area which the proposed project will or may have an effect on. Typically, Energy Commission staff has defined the affected area as the area potentially impacted by the proposed project (primarily for air quality, public health, noise, water, traffic and visual). The affected area for the MLPPP was initially determined by Energy Commission staff as that area within a five-mile radius of the site and represents the area affected by various project emissions. A more specific analysis of the affected area will be provided in the Final Staff Assessment when isopleths of the project area and the results of the air quality analysis are incorporated into the environmental justice analysis.

SOCIOECONOMICS TABLE 1 contains 1999 population estimates for each census tract in the five-mile area of the MLPPP. Data for this table were obtained from the marketing firm of Claritas. Claritas produces demographic estimates and projections based on data solicited from local, state, and federal government agencies, and private sector sources. Sources include U.S. Bureau of Labor Statistics, U.S. Bureau of the Census, U.S. Postal Service, and city and regional planning departments. According to the guidelines, a minority population exists if the minority population percentage of the affected area is fifty percent or greater than the affected area s general population. Based on the screening process for

environmental justice, information in **SOCIOECONOMICS TABLE 1** indicates that the minority population of the affected area is 58.5%.

The poverty threshold for a family of four persons was $12,674 per year (1990 US Census Data). To determine the number of persons below the poverty level, Energy Commission staff reviewed data from the 1990 US Census: Poverty Status By Age; Universe: Persons for whom poverty status is determined (the aggregate number of persons five years and under to seventy-five years and over).

SOCIOECONOMICS TABLE 2 indicates that the total number of people living below the poverty level is 3,603, or about 11.5 percent of the total population of the census tracts within five miles of the MLPPP site. As stated above, a minority population exists if the minority population percentage of the affected area is fifty percent or greater than the affected area s general population. Because the guidelines do not give a percentage of the population as a threshold to determine the existence of a low-income population, Energy Commission staff used the fifty-percent threshold used for minority populations.

SOCIOECONOMICS Table 1
Demographic Profile for Census Tracts Within Five Miles of the MLPPP Site

Census Tract	Hispanic Origin	White	Black	American Indian	Asian Pacific Islander	Other Race	Total by Tract
010198	4795	1668	17	14	280	24	6798
010201	2614	762	2	38	241	13	3670
010202	1385	2062	15	33	139	14	3648
010301	1574	5740	175	85	617	19	8210
010302	687	1005	27	14	69	3	1805
0104	3999	445	63	17	251	22	4797
012301	26	713	48	3	135	0	925
Totals	**15080**	**12395**	**347**	**204**	**1732**	**95**	**29853**
% of Totals	**50.5%**	**41.5%**	**1%**	**<1%**	**5.8%**	**<1%**	

Source: Claritas. Race and Hispanic Origin population estimates for 1999

SOCIOECONOMICS Table 2

Percentage of Persons Living Below the Poverty Level Within Five Miles of the MLPPP Site

Census Tract	Number of Persons in Tract	Persons Below Poverty Level
010198	7397	889
010201	3791	364
010202	3747	150
010301	8451	742
010302	1858	327
0104	5272	1057
012301	942	74
Totals	**31458**	**3603**

Source: 1990 US Census Data, Statistical Information on Population

The screening analysis indicates that there are 58.5 percent minorities living within the project s affected area. Environmental analysis will be conducted in the areas of public health and air quality to determine whether there are any significant and adverse impacts and whether these impacts will disproportionately affect the minority population.

CUMULATIVE IMPACTS

Figure 6.10-3 in the Supplemental Filing shows the workforce loading for cumulative (selective catalytic reduction installation, demolition of existing oil tanks, and project) onsite activities. Cumulative onsite activities will occur over a 35-month period and will employ a maximum of about 732 construction workers during the peak construction period.

The project consists of three components: demolition of existing fuel oil storage tanks and related environmental cleanup; the installation of selective catalytic reduction (SCR) to Units 6 and 7; and project construction. For purposes of determining the availability of local construction labor and socioeconomic impacts to the project area, staff will consider the project to include all three components. As shown in Table 6.10-9 in the AFC (Cumulative Construction Labor Needs And Available Labor By Craft), the number of workers from the tri-county area is more than adequate for the cumulative workforce requirements. As stated earlier, because of the availability of local labor, Energy Commission staff does not expect any adverse cumulative impacts to schools, police, or housing.

MITIGATION

Because the applicant has identified economic and fiscal benefits to the project area through sales tax and direct purchases of construction materials and services from local vendors (Duke Energy 1999a), Energy Commission staff is proposing a condition of certification to ensure that some economic benefit occurs in the project area.

FACILITY CLOSURE

Energy Commission staff does not know of any Socioeconomic LORS related to facility closure. Facility closure would have to comply with the Facility Closure conditions of certification contained in the **FACILITY CLOSURE** section of the PSA.

CONCLUSION AND RECOMMENDATION

The applicant has identified economic and fiscal benefits to the project area. To ensure that some economic benefit occurs in the project area, Energy Commission staff has proposed a condition of certification that requires the project owner and its contractors and subcontractors to recruit employees and procure materials and supplies locally. 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 and procure materials and supplies within Monterey, Santa Cruz, and San Benito Counties first 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 from 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. The CPM shall review and comment on the submittal as needed.

SOCIO-2 The project owner shall pay the statutory school facility development fee and fire facilities fee as required at the time of filing for the in-lieu building permit with the Monterey County Building Department.

Verification: The project owner shall provide proof of payment of the statutory development fee in the next Monthly Compliance Report following the payment.

SOCIO-3 At least 60 days prior to any ground disturbances, the project owner shall reach an agreement with the North County Fire Protection District on the amount of fees and timing of payment MLPPP will provide to cover project-specific impacts associated with fire protection and the purchase of a new 65-foot minimum Quint ladder truck equipped for elevated stream fire suppression and high angle and confined space rescues; and first year funding for three new positions for personnel (a captain, an engineer and a firefighter), or the equivalent of the identified staffing as agreed to by the North County Fire Protection District to cover three shifts for the new truck.

Verification: Not later than 30 days prior to any ground disturbance, the project owner shall provide the CPM with a copy of an agreement with the North County Fire Protection District and the owners of the MLPPP for funding of equipment and additional staff.

REFERENCES

Aguero, Julie. Monterey County Tax Assessor s Office. Conversation with staff on January 21, 2000.

AMBAG 1999. Association of Monterey Bay Area Governments.

Brassfield, Mike. Monterey County Sheriff. Conversation with staff on December 20, 1999.

California State Board of Education 1999. Educational Demographics Unit; www.cde.ca.gov/demographics.

Crisp, Wynlee. Objective Determination of Disproportionate Impacts in Environmental Justice Impacts. Paper presented at the National Association of Environmental Professionals annual meeting, June 22, 1999.

Downing, Sam. Chief Executive Officer, Salinas Valley Memorial Hosapital. Conversation with staff on 1/18/00

Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.

Duke Energy. 1999c. Data Adequacy Supplemental filing, dated November 22, 1999.

Heim, Marilyn. Department of Finance, Demographic Research Unit. Conversation with staff on March 6, 1998.

Oosterhous, Christy 1999. AMBAG. Conversation with staff on November 9, 1999.

Pereira, Mark. Fire Chief, North County Fire Protection District. 1/10/00 letter commenting on MLPPP.

Pereira, Mark. Fire Chief, North County Fire Protection District. Conversation with staff on 1/18/00.

Scheuermann, Karen, USEPA. Conversation with Energy Commission staff on March 26, 1998.

Stefani, Ron. Division Chief, North County Fire District Station 1. Conversation with staff on December 6, 1999.

US Environmental Protection Agency. Guidance for Incorporating Environmental Justice Concerns in EPA s NEPA Compliance Analyses, July 12, 1998.

US Census 1990. California: Preliminary Counts for Cities, Counties, and State ; April 1, 1990.

BIOLOGICAL RESOURCES

Marc Sazaki

INTRODUCTION

This section provides the California Energy Commission staff's analysis of potential impacts to biological resources from Duke Energy Moss Landing LLC's proposal to construct and operate the Moss Landing Power Plant Project (MLPPP). The focus of this analysis is directed toward impacts to state- and federally-listed species, fully protected species, species of special concern, wetlands, and other areas of critical biological concern. It describes the biological resources of the project site and ancillary facilities; determines the need for mitigation; determines the adequacy of mitigation proposed by the applicant and, where necessary, specifies additional mitigation measures to reduce identified impacts to less than significant levels; determines compliance with applicable laws, ordinances, regulations, and standards; and recommends conditions of certification.

Threatened or endangered species are those formally recognized and listed by the state or federal government. Fully protected species receive special legal protection from the state in the form of prohibition against take or unauthorized collecting and possession. Species of special concern are candidate threatened or endangered species or unique species that are protected through state and local permitting processes by requiring mitigation to minimize potential adverse effects resulting from project development. This particular category also includes, but is not limited to, those rare and endangered plant species recognized by the California Native Plant Society. Though endangered plant species recognized by the California Native Plant Society may not be formally listed by state or federal governments, the same species may be considered endangered under the California Environmental Quality Act (CEQA) (Cal. Code Regs., tit. 14,⁄15380 (d)). Recreational species are generally ones that are harvested by the public for sport or utilized for nonconsumptive purposes.

Areas of critical concern are special or unique habitats or biological communities. This category includes, but is not limited to, wildlife refuges and wetlands. Both species of special concern and areas of critical concern may be identified by the California Natural Diversity Data Base (CNDDB) and other state, federal, and local agencies with responsibility within the project area or by educational institutions, museums, biological societies and special interest groups that might have specific knowledge of resources within the project area.

Terrestrial biological resource surveys conducted by consultants for the applicant provide information useful in determining the potential impacts related to the power plant and its ancillary facilities. (Duke Energy 1999a and b) However, surveys of the estuarine and marine environment that supports animal species subject to entrainment, impingement, and thermal discharge effects of the once-through

cooling water system are incomplete. These surveys are required as part of the NPDES permitting process required under Section 402 of the Clean Water Act, which is administered by the Central Coast Regional Water Quality Control Board. The applicant is required to utilize best technology available to minimize potential once-through cooling water impacts on biological resources. Until completion of the 316(b) study and determination of the best entrainment and impingement technology available for the proposed project, as well as 316(a) thermal studies to determine if the proposed project can meet the thermal discharge requirements for new thermal discharges, a complete assessment of the potential impacts and necessary mitigation for the once-through cooling water system, which would lead to an NPDES permit, will not be attainable.

Conversely, for terrestrial biological resources, impacts are expected to be minimal because of the highly industrialized nature of the project site, and where impacts might occur, general mitigation approaches proposed by the applicant in combination with mitigation measures proposed by Energy Commission staff in consultation with the California Department of Fish and Game are expected to adequately mitigate any impacts to plants and animals that could utilize the project site and immediate vicinity.

As a consequence of the incomplete 316(a) and 316(b) studies, proposed Conditions of Certification for biological resources affected by the once-through cooling water system cannot be determined at this time and Energy Commission staff is unable to conclude that there are not likely to be significant biological resources impacts associated with the construction and operation of the proposed Moss Landing Power Plant Project.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

- The Endangered Species Act of 1973 (16 U.S.C.,⁄1531 et seq.), and implementing regulations, (50 C.F.R.⁄17.1 et seq.), designate and provide for protection of threatened and endangered plants and animals and their critical habitat.

- Migratory Bird Treaty Act (16 U.S.C.⁄701-718) and implementing regulations (50 C.F.R.) Subchapter B (⁄10.1-24.12) provides protection for migratory birds.

- Marine Mammal Protection Act (16 U.S.C. Chapter 31⁄1361-1375) provides protection for marine mammals.

STATE

- California Native Species Conservation and Enhancement Act, (Fish & Game Code,⁄1750 et seq.), mandates as state policy, maintenance of sufficient

populations of all species of wildlife and native plants and the habitat necessary to ensure their continued existence at optimum levels.

- California Endangered Species Act, (Fish & Game Code,⁄2050 et seq.), protects California s endangered and threatened species. The implementing regulations, (Cal. Code Regs., tit.14,⁄670.5), lists animals of California declared to be threatened or endangered.

- Native Plant Protection Act (Fish & Game Code,⁄1900 et seq.), establishes criteria for determining if a species, subspecies, or variety of native plant is endangered or rare and regulates the taking, possession, propagation, transportation, exportation, importation, or sale of endangered or rare native plants.

- Fish and Game Code, section1603 requires that any person planning to substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake designated by the department, or use any material from the streambeds, must notify the department prior to such activity so that the department can carry out its mandate by proposing measures necessary to protect the fish and wildlife.

- Fish and Game Code sections 3511, 4700, 5050, and 5515 prohibit the taking of birds, mammals, reptiles and amphibians, and fish, respectively, listed as fully protected in California.

- Fish and Game Code, section 1900 et seq., gives CDFG authority to designate state endangered and rare plants and provides specific protection measures for identified populations.

- Fish and Game Code, section 3513 makes it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act except as provided for under federal rules and regulations.

LOCAL

- Monterey County Coastal Implementation Plan, Part 2, Regulations for Development in the North County Land Use Plan Area, Chapter 20.144.040 — Environmentally Sensitive Habitat (ESH) Development Standards.

  A. Biological Survey Requirement
     1. A biological survey (BS) shall be required for all proposed development that:
        c. is or may be located within 100 feet of an ESH;

  <u>B. General Development Standards</u>

1. All development shall be prohibited in the following ESHs: riparian corridors, wetlands, dunes, sites of known rare and endangered species of plants and animals, rookeries, major roosting and haul-out sites, and other wildlife breeding or nursery areas identified as environmentally sensitive.
2. Development containing or within 100 feet of ESH shall be modified to reduce adverse impacts to an insignificant level. Mitigation measures of the BS will be considered and incorporated into the conditions of approval.
3. New land uses within 100 feet of ESH cannot adversely affect the habitat either on a project or cumulative basis. Projects will only be approved where the decision will not set a precedent for development which, on a cumulative basis, could degrade the habitat.
6. Deed restrictions or conservation easement dedications over ESH areas shall be required as a condition of approval, even on previously developed parcels of land. Where the proposed project is to occur on an already-developed parcel, restrictions or easement dedications over the habitat area shall still be required.
8. Removal of vegetation and land disturbance on parcels containing or adjacent to ESH areas must be limited to the extent necessary for structural improvements and driveway access. Modifications will be made to reduce habitat impacts.
9. Use of native species found in the project area shall be required in the landscaping as a condition of approval.
10. Construction activities and industrial uses affecting rare, threatened, and endangered birds must protect these birds during breeding and nesting seasons as a condition of approval. These regulations shall not prohibit emergency operation of public utilities.

C. <u>Specific Development Standards</u>
   2. Riparian, Wetland, and Aquatic Habitats
      d. All development must be set back a minimum of 100 feet from the landward edge of vegetation associated with coastal wetlands (including Elkhorn Slough and Moro Cojo Slough).
      e. Development with the potential to impact riparian, wetland, or aquatic habitat must be conducted to avoid breeding seasons and other critical phases in the life cycles of commercial fish and shellfish and rare, threatened or endangered indigenous species. Mitigation measures shall be made conditions of approval.
      f. Development near harbor seal haul-out areas cannot adversely impact the viability or long-term maintenance of this habitat.
   3. Marine habitats
      a. Development proposing wastewater discharge into Monterey Bay and coastal waters of Monterey County will be reviewed by the Health Department. Submission of these studies is a requirement of application completion.

SETTING

REGIONAL DESCRIPTION

The regional landscape includes a variety of habitats including broad beaches, dunes, mildly sloping dune terraces and hilly uplands. The uplands are composed of grasslands, oak woodlands, Monterey pine groves, and coastal scrub. There are also salt marshes, mudflats, and rocky intertidal substrates providing complex habitats for innumerable living organisms. The range in temperature extremes is somewhat moderated by offshore westerly breezes. These habitats are described in greater detail in the AFC (Duke Energy 1999a) and Supplemental Information filing (Duke Energy 1999j). Much of the land has been converted to agriculture — row crops and livestock grazing. Specific areas of critical biological concern are the Elkhorn Slough National Research Reserve, which adjoins the much larger (5,300 square mile) Monterey Bay National Marine Sanctuary near Moss Landing Harbor about midway between the cities of Santa Cruz and Monterey.

The ocean shore, dunes, and undeveloped upland areas as well as wetlands in the region support many amphibians, reptiles, passerines, raptors, shore birds, waterfowl, and small to medium sized mammals. A list of plant and animal species recognized as being of special concern or protected under state and federal regulations are listed in Table 1. The following three informational items are notable: 1) On October 17, 1999 at least twenty tidewater gobies (*Eucyclogobius newberryi*) were collected in the upper reaches of Bennett Slough about one mile north of the proposed power plant (Swift 1999). Other investigators also collected them here in June of 1976 (Nybakken et al. 1977). Water from this slough can eventually make its way to the north arm of Moss Landing Harbor. 2) Mud flat and salt pond areas in Elkhorn Slough have recently been designated as Critical habitat for the Pacific coast population of the western snowy plover (*Charadrius alexandrinus nivosus*) because of its nesting value (USFWS 1999). 3) Leatherback turtles frequent waters of the western coast of the United States including Monterey Bay. They are the most common sea turtle in U.S. waters north of Mexico. Surface feeding on jellyfish has been reported in these U.S. waters, but no systematic studies have been done to determine the relative importance of various foraging habitats (NMFS 1998).

SITE AND VICINITY DESCRIPTION

Site-specific field surveys for biological resources were conducted at the project site and laydown area by the applicant s biologists in January, March, April and May of 1999 (DEML 1999c). Energy Commission staff visited the power plant site on May 20, 1999 in the company of the applicant s terrestrial biologists, a biologist from the California Department of Fish and Game, and a representative from the U.S. Army Corps of Engineers.

Table 1
BIOLOGICAL RESOURCES
Sensitive Species

Sensitive Plants	Status*
Coastal dunes milk-vetch (*Astragalus tener* var. *titi*)	CNPS List 1B/SCE /FE
Monterey spineflower (*Chorizanthe pungens* var. *pungens*)	CNPS List 1B/FT
Robust spineflower (*Chorizanthe pungens* var. *robusta*)	CNPS List 1B/FE
Coast wallflower (*Erysimum ammophilum*)	CNPS List 1B/SC
Sand gilia (*Gilia tenuiflora* ssp. *arenaris*)	CNPS List 1B/ST/FE
Santa Cruz tarplant (*Holocarpha macradenia*)	CNPS List 1B/SCE/FPT
Beach layia (*Layia carnosa*)	CNPS List 1B/SE/FE
Tidestrom's lupine (*Lupinus tidestromii*)	CNPS List 1B/SE/FE
Yadon's rein orchid (*Piperia yadonii*)	CNPS List 1B/FE
Hickman's potentilla (*Potentilla hickmanii*)	CNPS List 1B/SE/FE

Sensitive Wildlife	Status
Black legless lizard (*Anniella pulchra nigra*)	CSC/SC
San Francisco garter snake (*Thamnophis sirtalis tetrataenia*)	CSC/FT
Western burrowing owl (*Athene cunicularia*)	CSC/SC
Tricolored blackbird (*Agelaius tricolor*)	CSC/SC
Bank swallow (*Riparia riparia*)	ST
Short-eared owl (*Asio flammeus*)	CSC
Western snowy plover (*Charadrius alexandrinus nivosus*)	CSC/FT
Southwestern pond turtle (*Clemmys marmorata pallida*)	CSC/SC
California tiger salamander (*Ambystoma californiense*)	CSC/C
California red-legged frog (*Rana aurora draytonii*)	CSC/FT
Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*)	SE/FE
Clafiornia brackishwater snail (*Mimic tryonia*)	SC
Tidewater goby (*Eucyclogobius newberryi*)	CSC/FE
Southern sea otter (*Enhydra lutris nereis*)	FP/FT
California brown pelican (*Pelecanus occidentalis californicus*)	SE/FE
California least tern (*Sterna antillarum browni*)	FE
Leatherback turtle (*Dermochelys coriacea*)	FE

*** Status legend:**

CNPS List 1B = Plants rare or endangered in California and elsewhere (California Native Plant Society 1994), FE = Federally listed Endangered, FT = Federally listed Threatened, SC = Federal species of concern, FPT = Federally Proposed (Threatened), C = Federal Candidate, CSC = CDFG species of special concern, FP = CDFG fully protected, ST = State listed Threatened, SCE = State Candidate (Endangered) SE = State listed Endangered.

Many common species of plants and animals were observed during surveys in the vicinity of the proposed power plant within the Duke property (Duke Energy 1999c). Sixty-five per cent of the plant species were non-native; indicating in general that disturbance and land modification at the site over time has not favored natives. Examples of common animals include Pacific chorus frog (*Pseudacris regilla*), Pacific slender salamander (*Batrachoseps* pacificus), American kestrel (*Falco sparverius*), European starling (*Sturnus vulgaris*), mourning dove (*Zenaida macroura*), Brewer s blackbird (*Euphagus cyanonecephalus*), house finch (*Carpodacus mexicanus*), California ground squirrel (*Spermophilus beecheyi*), and mule deer (*Ococoileus hemionus*).

In contrast to the many common species observed during the surveys, tricolored blackbirds (*Agelaius tricolor*) were seen foraging over a wetland within an oil spill retention area on the extreme east side of the Duke property near oil tank 14 (Duke Energy 1999c). This is a species of special concern for the California Department of Fish and Game and is the only species listed in Table 1 observed during the terrestrial surveys of the site.

Marine and estuarine fauna inhabiting the waters and benthic habitats in close proximity to the proposed project, including Elkhorn Slough intertidal and Moss Landing Harbor and offshore subtidal has been described in considerable detail based on investigations done in July 1974 to June 1976 (Nybakken et al. 1977). Additional studies done to meet previous NPDES permitting requirements or Central Coast Regional Water Quality Control Board information needs associated with the Moss Landing Power Plant identify a myriad of species that have potentially been subject to impacts associated with the once-through cooling water system that has operated at various levels since the first unit was brought on line in 1950 (PG&E 1973, 1978 and 1983).

Major modifications to the Salinas River mouth and its geophysical association with Elkhorn Slough in the early 20th century and the excavation of Moss Landing Harbor during the mid-20th century have significantly changed the hydrodynamics of the slough (Lindquist 1998). Further modifications in the watershed in the mid 1980 s that were done to increase marsh acreage magnified the tidal currents and rates of channel scour and erosion in the slough. Lindquist (1998) has found that reduced trophic diversity has resulted from the increased erosion and that a shift in the diet of fish using the slough as a nursery is evident. There is concern about whether Elkhorn Slough and its associated tidal creeks will continue to function as a viable fish nursery.

Marine mammals such as harbor seals (*Phoca vitulina richardsi*), southern sea otters (*Enhydra lutris nereis*), and sea lions (*Zalophus californianus*) inhabit Elkhorn Slough, Moss Landing Harbor and nearby off shore waters (Duke Energy 1999i). Counts of harbor seals at a monitoring station 1.6 km east of the Highway 1 Bridge have steadily increased from 17 to 297 animals during the period from 1982 to 1995

(Fluharty 1999). Sea otter counts by the California Department of Fish and Game and the U. S. Fish and Wildlife Service in the Monterey Bay between the Capitola Pier and Seaside (north and south of Moss Landing respectively) indicate that observed numbers of sea otters here have shown a increasing trend from the mid-80 s to the mid-90 s. Declines in the sea otter population in the southern part of its range do not appear to be occurring in Capitola/Seaside area (Duke Energy 1999i). Relative counts of sea lions in the Elkhorn Slough area have not been reviewed for this assessment.

Brown pelicans (*Pelecanus occidentalis californicus*) generally forage in offshore waters near Moss Landing and other parts of Monterey Bay. A noteworthy incidental observation has been reported (Williams 1999) in which a pelican used a transmission line connected to the Moss Landing Power Plant as a perch to dive from while trying to catch fish.

PROJECT SPECIFIC IMPACTS

The site and laydown areas are in an highly disturbed industrialized area that, over time, has experienced the unassisted establishment of very small seasonal wetlands in the oil spill containment areas of some of the retired oil tanks (Duke Energy 1999c). Surveys were conducted for the Santa Cruz long-toed salamander (SCLTS) in one of the small seasonal wetlands that may be affected by the project, but no salamanders or larvae were observed. The field investigator, Mr. Bryan Mori (a recognized expert on this species), suggested that the habitat was marginal and relatively disconnected from known subpopulations nearby which could act as dispersal sites from which breeding salamanders could emigrate to the location examined at the proposed project (Duke Energy 1999c). Although no salamanders were found, if actually present, he expected there would only be a few.

Soil erosion related to construction activities can impact aquatic biological resources if allowed to enter local waterways, but applying appropriate site-specific measures can mitigate potential erosion. A draft erosion control plan should be submitted to the Energy Commission for review and approval. Through implementation of an approved erosion control plan, that will be required in the Soil Resources Conditions of Certification for this project, it is anticipated that aquatic biological resources will not be significantly impacted.

The potential for bird collisions with the project s new 145-foot tall turbine/HRSG stacks is considered low because this kind of bird mortality appears to be associated with relatively tall stacks ranging from 500 to 650 feet high (Goodwin 1975; Maehr et al. 1983; Weir 1974; Zimmerman 1975). The new stacks will be close to the 500-foot stacks for Units 6&7 and the 180-foot tall boiler building suggesting that these existing tall and large structures would shield the smaller stacks. However, studies of avian collisions have focused on taller stacks. If monitoring is done for a period of time after construction, it can be determined if this is a significant problem, particularly with bird species of special concern.

Impacts associated with the thermal discharge and entrainment losses of marine and estuarine species due to the once-through cooling water system will be addressed when the 316(a) and (b) studies required for the NPDES permit are completed and estimates of adult equivalent losses for entrained species are derived and can be considered in conjunction with impingement losses of these and other species based on preexisting data developed for Units 6&7.

CUMULATIVE IMPACTS

Cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

Considering the level of industrial development within the existing power plant complex at Moss Landing, Energy Commission staff does not regard the potential incremental terrestrial biological resources impacts of the proposed project as significant.

With respect to the marine environment, an assessment cumulative impacts will be developed by Energy Commission staff when the results of 316(a) and (b) studies required for the NPDES permit are completed and estimates of adult equivalent losses for entrained species are derived and can be considered in conjunction with impingement losses of these and other species based on preexisting data developed for Units 6&7, as well as any relationship to management practices being implemented in the Elkhorn Slough National Research Reserve.

FACILITY CLOSURE

For the eventual permanent closure of the power plant project, the project owner must utilize methods and measures that protect the environment and public health and safety. To achieve this, the project owner will develop an on-site contingency plan for facility closure as required in General Conditions of Certification. Detailed measures specifically addressing biological resources, such as structure removal and habitat restoration, should be done according to Biological Resources Condition of Certification **BIO-6**. The plan should also include the anticipated measures that would be implemented in case of a temporary, but prolonged closure.

MITIGATION

Small wetlands that have become established in oil spill retention areas around oil tanks scheduled for removal due to project construction should be compensated for in a manner specified by the California Department of Fish and Game.

To mitigate for potential impacts to Santa Cruz long-toed salamanders (SCLTS), that is, if the California Department of Fish and Game and the U. S. Fish and Wildlife Service are agreeable, it is suggested that the following be done:

1) A drift fence pitfall trap study should be incorporated in the fall prior to project initiation in order to remove any SCLTS that may be present at the project site. The drift fence should encircle the entire project construction site and construction support areas to capture SCLTS moving into and out of the project site. The drift fence should be installed before October 15 and monitored during each rainstorm through the end of March. All SCLTS captured should be photographed, sexed and measured, then relocated to a suitable off-site location. The drift fence should remain in place until the project is completed.
2) After the drift fence study and prior to ground disturbance, the vegetation along the berms should be removed by hand only. Biological monitors should be present to recover any salamanders that may be present. All SCLTSs collected should be photographed, sexed and measured, then relocated to a suitable off-site location.
3) During the initial grading process, biological monitors should be present to search through the spoils to recover any remaining salamanders. All SCLTSs collected should be photographed, sexed and measured, then relocated to a suitable off-site location.
4) During the construction phase, the drift fence encircling the project construction site and construction support areas should be fully operational prior to the first fall rains of each year the project remains under construction, and the drift fence should be monitored through each winter until the project is completed.

To ensure the likelihood of successful completion of required mitigation, the project owner should designate a qualified biologist to advise the project owner or its project manager on the implementation of the Conditions of Certification, for this project and to supervise or conduct mitigation, monitoring, and other biology compliance efforts.

To promote project personnel s general understanding of environmental concerns associated with the project and enhance the likelihood of their compliance with conditions of certification, the owner should institute an employee environmental awareness program in which each of its own employees, as well as employees of contractors and subcontractors who work on the project site during construction and operation are informed about biological resource sensitivities associated with the project.

To make sure required biological resources mitigation measures are successfully completed during construction and operation of the project, a Biological Resources Mitigation Implementation and Monitoring Plan should be developed by the project owner and reviewed and approved by the Energy Commission Compliance Project Manager.

In order to prevent animals from becoming trapped in any trenches excavated while installing natural gas pipelines or other underground project features, the project owner, at the end of the workday, should have any open portions of the trench covered if left unattended.

The project owner should develop and implement a plan to monitor bird mortality due to collision with the turbine/HRSG stacks on the project.

Best technology available for reducing impacts associated with the once-through cooling water system should be used at the project. For marine and estuarine biological resource losses that exceed the capabilities of best technology available, reasonable compensation needs to be provided.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The U.S. Army Corps of Engineers has issued a Letter of Permission (Dated June 21, 1999) authorizing Duke Energy Power Services to make modifications to the Units 1-5 cooling water intake structure so it can be used for the new project.

The U.S. Army Corps of Engineers has issued a determination (dated September 23, 1999) that the small wetlands in the some of the oil spill containment areas that will be affected by project construction are not waters of the U.S. As such, no permit is required under Section 404 of the Clean Water Act (33 U.S.C. 1344).

The Central Coast Regional Water Quality Control Board has not issued an NPDES permit for the proposed project because 316(a) and (b) studies are not complete. The respective objectives of these studies are to determine if Thermal Plan standards for new facilities can be met and that cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts. Study protocols and their implementation for the Moss Landing Power Plant Project are provided guidance by a Technical Working Group comprised of consulting experts representing the Central Coast Regional Water Quality Control Board, California Department of Fish and Game, California Energy Commission, and Duke Energy Moss Landing, LLC.

The suitability of thermal plume data being collected to meet 316(a) analytical requirements is periodically examined by the Technical Working Group within the realm of the Central Coast Regional Water Quality Control Board regulatory process and appropriate modifications are incorporated into the sampling protocol as needed. Since this data was not collected and analyzed prior to the AFC filing, the protocol changes have led to a delay in production of a draft final report. This delay in complete data presentation prevents a timely analysis and determination of whether or not the proposed discharge is able to meet required standards which prohibit a discharge that exceeds the receiving water ambient temperature more that 20◦F for a specified period or 4◦F above natural water temperatures at the

shoreline, the surface of any ocean substrate, or the ocean surface beyond 1,000 feet from the discharge for a specified period. If it is determined that the standards cannot be met, the permittee can request an exception to the standards and get a variance, which may require additional time to complete. The process for granting exceptions to the standards is further described in the Water Resources Section of the PSA.

Likewise, for the 316(b) studies, data acquisition is critical in estimating impacts on species populations that result from entrainment and impingement of organisms into the once-through cooling water system. Generally a year of data is required to cover seasonal periods when distribution and abundance of marine and estuarine life forms can be significantly different. In order to determine the proportions of organisms that are being entrained in the power plant cooling system relative to the population from which they come, source water sampling must be done. This is usually done on a volumetric basis of organism per cubic meter. A three-month delay in starting this source water sampling has resulted in a delay in preparing a draft 316(b) report along with its supporting data. And most recently, it was discovered that source water sampling was done only during the day while the highest number of organisms have been entrained at night. To provide data for a valid comparison of the proportion of organisms entrained in relation to those in the source water, nighttime sampling has been initiated. This will delay the submittal of a draft 316(b) report and its supporting data by about a year unless preliminary results after about three months or so can be ascertained by the Technical Working Group to be useful for extrapolating missing data. If this is true, a draft 316(b) report could possibly be produced by May 2000. Subsequently, an Energy Commission Final Staff Assessment could be prepared by July 2000 at the earliest.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Impacts associated with the project site and laydown area are likely to be insignificant, but where the potential for impacts to listed species exists, they can be mitigated to acceptable levels. However, significance of impacts from the once-through cooling water system (impingement, entrainment, and thermal) is uncertain at this time. Until completion of the 316(a) and (b) studies required for an NPDES permit, appropriate mitigation cannot be determined.

RECOMMENDATIONS

Until the studies for the NPDES permit are completed and necessary mitigation developed for impacts to marine and estuarine biological resources, the proposed project should not be approved. When the impact and mitigation determinations are completed for the NPDES permit, the mitigation measures should be incorporated into Energy Commission staff s other proposed Conditions of Certification.

CONDITIONS OF CERTIFICATION

These proposed conditions of certification are preliminary. They will be finalized when impacts and mitigation of the once-through cooling water system are determined.

BIO-1 Any ground disturbing activity (at the site and/or ancillary facilities) other than allowed geotechnical work shall not begin until an Energy Commission Compliance Project Manager (CPM) approved designated biologist is available to be on site.

Protocol: The designated biologist must meet the following minimum qualifications:

1) a bachelor s degree in biological sciences, zoology, botany, ecology, or a closely related field,

2) three years of experience in field biology or current certification of a nationally recognized biological society, such as the Ecological Society of America or The Wildlife Society,

3) one year of field experience with resources found in or near the project area, and

4) ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for the biological resource 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.

Verification: No disturbance will be allowed in any designated sensitive area(s) until the CPM approves a designated biologist and that designated biologist is on-site. At least 30 days prior to the start of surface disturbing activities at the project site and/or at ancillary facilities, 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 to the CPM.

If the project owner is not in compliance with any aspect of this condition, the CPM will notify the project owner of making this determination within 14 days of becoming aware of the existence of any noncompliance. Until the project owner corrects any identified problem, construction activities will be halted in areas specifically identified by the CPM or designee as appropriate to assure the potential for significant biological impacts is avoided.

For any necessary corrective action taken by the project owner, a determination of success or failure of such action will be made by the CPM after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

BIO-2 The CPM approved designated biologist shall perform the following duties:

1) advise the project owner s supervising construction or operations engineer on the implementation of the biological resource conditions of certification,

2) supervise or conduct mitigation, monitoring, and other biological resource compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as, wetlands and special status species, and

3) notify the project owner and the CPM of any non-compliance with any condition.

Verification: 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.

BIO-3 The project owner s supervising construction and operating engineer shall act on the advice of the designated biologist to ensure conformance with the biological resource conditions of certification.

Protocol: The project owner s supervising construction and operating engineer shall halt, if needed, all construction activities in areas specifically identified by the designated biologist as sensitive to ensure that potential significant biological resource impacts are avoided.

Protocol: The designated biologist shall:

1) advise the project owner and the supervising construction and operating engineer when to resume construction, and

2) advise the CPM if any corrective actions are needed or have been instituted.

Verification: Within two working days of a designated biologist notification of non-compliance with a Biological Resources condition 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 working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

BIO-4 The project owner shall develop and implement a Worker Environmental Awareness Program in which each of its own employees, as well as employees of contractors and subcontractors who work on the project site or related facilities (including any access roads, storage areas, transmission lines, water and gas lines) during construction and operation, are informed about biological resource sensitivities associated with the project.

Protocol: The Worker Environmental Awareness Program:

a) shall be developed by the designated biologist and consist of an on-site or classroom presentation in which supporting written material is made available to all participants;

b) must discuss the locations and types of sensitive biological resources on the project site and adjacent areas;

c) must present the reasons for protecting these resources;

d) must present the meaning of various temporary and permanent habitat protection measures;

e) must identify who to contact if there are further comments and questions about the material discussed in the program; and,

f) shall inform workers of the potential biological resource impact risk associated with all construction and operational activities as is appropriate and emphasize protection of sensitive resources such as the Santa Cruz long-toed salamander.

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 material. The person administering the Worker Environmental Awareness Program shall also sign each statement.

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. The project owner shall keep signed statements for active operational personnel on file for the duration of their employment and for six months after their termination.

Verification: At least 30 days prior to the start of surface disturbing activities at the project site and/or at ancillary facilities, the project owner shall provide copies of the Worker Environmental Awareness Program and all supporting written materials prepared by the designated biologist and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date.

BIO-5 The project owner shall submit to the CPM for review and approval a copy of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) for this project.

Protocol: The BRMIMP shall:

- identify all sensitive biological resources to be impacted and avoided by project construction and operation;

- identify all mitigation, monitoring and compliance conditions included in the Commission s Final Decision;

- identify all conditions agreed to in any CDFG Streambed Alteration Agreement;

- indicate the placement of transmission line towers so that wetland resources will be avoided, or if not avoided, constructed in such a way that impacts will be minimized to the extent practicable.

- design new above-ground transmission lines to reduce the risk of electrocution for large birds;

- clearly delineate construction area boundaries with stakes, flagging, and/or rope to minimize inadvertent degradation or loss of wetland habitat during construction activities associated with pipelines and transmission lines;

- show all locations requiring temporary protection/signs during construction on a map of suitable scale;

- indicate duration for each type of monitoring established for mitigation actions and include a description of the monitoring methodologies and frequency;

- describe performance standards to be used to help decide if/when proposed mitigation is or is not successful;

- identify all remedial measures to be implemented if performance standards are not met;

- reduce potential bird collisions with boiler stacks, cooling towers, turbine stacks and other structures by reducing exterior lighting on all structures to the minimum except for those required for aviation warning, while all other required exterior lighting on structures will be shielded to direct light downward;

- reduce soil erosion during construction and operation by applying measures identified in the proposed Soil Resources and Water Resources conditions of certification of the Energy Commission Decision for the project;

- include, with concurrence of the California Department of Fish and Game and the U. S. Fish and Wildlife Service mitigation for potential impacts to Santa Cruz long-toed salamanders (SCLTS), comprised of the following actions:

    1) A drift fence pitfall trap study should be incorporated in the fall prior to project initiation in order to remove any SCLTS that may be present at the project

site. The drift fence should encircle the entire project construction site and construction support areas to capture SCLTS moving into and out of the project site. The drift fence should be installed before October 15 and monitored during each rainstorm through the end of March. All SCLTS captured should be photographed, sexed and measured, then relocated to a suitable off-site location. The drift fence should remain in place until the project is completed.

2) After the drift fence study and prior to ground disturbance, the vegetation along the berms should be removed by hand only. Biological monitors should be present to recover any salamanders that may be present. All SCLTSs collected should be photographed, sexed and measured, then relocated to a suitable off-site location.
3) During the initial grading process, biological monitors should be present to search through the spoils to recover any remaining salamanders. All SCLTSs collected should be photographed, sexed and measured, then relocated to a suitable off-site location.
4) During the construction phase, the drift fence encircling the project construction site and construction support areas should be fully operational prior to the first fall rains of each year the project remains under construction, and the drift fence should be monitored through each winter until the project is completed.

- reduce the potential for animals falling into trenches or other excavated sites by covering them at the end of the workday if left unattended.

Verification: At least 60 days prior to the start of surface disturbing activities at the project site and/or at ancillary facilities, the project owner shall provide the CPM with the final version of the Biological Resources Mitigation Implementation and Monitoring Plan for this project, and the CPM will determine the plans acceptability within 15 days of receipt of the final plan. After the plan is approved, the project owner shall notify the CPM five working days before implementing any agreed to modifications to the Biological Resource Mitigation Implementation and Monitoring Plan.

Within 30 days after completion of construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the Biological Resources Mitigation Implementation and Monitoring Plan have been completed, a summary of all modifications to mitigation measures made during the project s construction phase, and which condition items are still outstanding.

BIO-6 The project owner shall incorporate into the facility closure plan a Biological Resources Element that includes measures to address current local biological resource issues. The biological resource facility closure measures shall also be incorporated into the Moss Landing Power Plant Project BRMIMP.

Protocol: For permanent closure, biological resource-related measures shall include:

1) Removal of all power plant site facilities;
2) Measures to restore wildlife habitat to promote the re-establishment of native plant and wildlife species; and
3) Updating the plan to address current biological resources issues.

Protocol: For temporary, but prolonged closure, biological resource-related measures shall include:

1) Notifying the CPM within two weeks of the project owner s decision to initiate a temporary, but prolonged closure;
2) Turning off the once-through cooling water system pumps; and
3) Updating the plan to address current biological resources issues.

Verification: At least twelve months (or a mutually agreed upon time) prior to the commencement of permanent closure activities a Biological Resources Element will be incorporated into the Facility Closure Plan and the BRMIMP and submitted to the CPM for review and comment. The CPM will be notified within two weeks of the project owner s decision for a temporary, but prolonged closure and provide an updated plan of action.

BIO-7 Site disturbance and project construction shall not commence until the project owner has developed a protocol for inclusion in a Biological Resources Mitigation Implementation and Monitoring Plan to monitor for bird mortality due to collision with the turbine/HRSG stacks on the project. The protocol shall include a thorough description of methods for collecting and recording this data.

As part of this protocol, a report describing the results after each year of monitoring shall be submitted to the CPM on the next closest annual report date established for the project in this decision. If the CPM determines that the report content or format requires changes, the project owner shall modify the report based on the CPM s comments.

If bird mortalities are documented as a result of the monitoring, the project owner shall recommend and, if deemed necessary and acceptable by the CPM, implement mitigation measures to reduce the mortalities. If no significant bird mortalities are documented within a 3-year period, the bird-monitoring program may be ended with concurrence of the CPM.

Verification: The CPM will review the Biological Resources Mitigation Implementation and Monitoring Plan submitted under condition of certification **BIO-5**. If the Biological Resources Mitigation Implementation and Monitoring Plan do not include the monitoring protocol listed above, the CPM will return the plan within 14 days to the project owner for revision. During operation of the project, the CPM or designee will determine via telephone or through visits to the project site, as

deemed necessary, whether or not the project owner has complied with this condition.

The CPM will review each monitoring report and, as deemed necessary, ask the project owner to modify and/or clarify the report content and/or format.

If the project owner has not complied with any aspect of this condition, the CPM will notify the project owner of making this determination. If the project owner fails to correct any identified problem within a reasonable time, as determined by the CPM, the CPM will initiate the Energy Commission s complaint filing process.

For any necessary corrective action taken by the project owner, a determination of success or failure of such action will be made by the CPM 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.

REFERENCES

Duke Energy (Duke Energy Moss Landing LLC). 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.

Duke Energy (Duke Energy Moss Landing LLC). 1999j. Moss Landing Power Plant Project — Marine Biological Resources and Cooling Water Report in Response to the CEC s July 16, 1999 Supplemental Data Adequacy Information Request — Duke Energy Moss Landing LLC. Prepared by TENERA Energy & Duke Fluor Daniel. Submitted to the California Energy Commission, July 21, 1999

Duke Energy (Duke Energy Moss Landing LLC). 1999c. Supplemental Filing of Data Adequacy Information — Application for Certification — Moss Landing Power Plant. Duke Energy Moss Landing LLC. Submitted to the California Energy Commission, July 30, 1999.

Duke Energy (Duke Energy Moss Landing LLC). 1999i. Moss Landing Power Plant. Responses to California Energy Commission Data Requests of 10/20/99. Submitted by Duke Energy Moss Landing, LLC. November 22, 1999.

Duke Energy (Duke Energy Moss Landing LLC). 1999i. Supplementary Filing — Moss Landing Power Plant Application for Certification. • Change in Project Description • Air Quality Increments & Cumulative Impacts Analysis • Responses to Additional California Coastal Commission Follow Up Questions. Submitted to the California Energy Commission, November 22, 1999.

Fluharty, Marilyn J. 1999. Summary of Pacific harbor seal, *Phoca vitulina richardsi*, surveys in California, 1982 to 1995. Marine Region. Administrative Report 99-1. California Department of Fish and Game, 4949 Viewridge Avenue, San Diego, California, 92123.

Goodwin. 1975. The Winter Season: Ontario Region. American Birds. 19(1):48-57.

Lindquist, David C. 1998. The Effects of Erosion on the Trophic Ecology of Fishes in Elkhorn Slough, CA. Master of Science Thesis. December, 1998. 65 pp.

Maehr, D.S., A.G. Spratt, and D.K. Voigts. 1983. Bird Casualties at a Central Florida Power Plant. Florida Field Naturalist. 11:45-68.

PG&E (Pacific Gas and Electric Co.). 1973. An Evaluation of the Effect of Cooling Water Discharges on the Beneficial Uses of Receiving Waters at Moss Landing Power Plant. Pacific Gas and Electric Company — San Francisco, California. July 1973.

PG&E (Pacific Gas and Electric Co.). 1978. Pacific Gas and Electric Company. Moss Landing Power Plants Units 1-5. 316(a) Demonstration Program. February 1978.

PG&E (Pacific Gas and Electric Co.). 1983. Moss Landing Power Plant Cooling Water Intake Structures 316(b) Demonstration. Prepared by: Ecological Analysts, Inc. Report PGE60K1. November 1983.

Swift 1999. Personal Communication w/ Mr. Camm Swift. December 2, 1999.

NMFS (National Marine Fisheries Service). 1998. Recovery Plan for U.S. Pacific Populations of the Leatherback Turtle (*Dermochelys coriacea*). June 12, 1998. 78 pp.

Nybakken, J.W., G.M. Cailliet and W.W. Broenkow. 1977. Ecologic and Hydrographic Studies of Elkhorn Slough, Moss Landing Harbor, and Nearshore Coastal Waters, July 1974 to July 1977. Moss Landing Marine Laboratories, Moss Landing, California. 1977.

USFWS (US Fish and Wildlife Service). 1999. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover, Final Rule. Federal Resister. December 7, 1999 (Volume 64, Number 234). Page 68508.

Weir, R.D. 1974. Bird Kills at the Lennox Generating Plant, Spring and Autumn 1974. Blue Bill. 21(4):61-62.

Williams 1999. Personal Communication via e-mail from Mr. Rick Williams. December 17, 1999.

Zimmerman, D.A. 1975. The Changing Seasons. American Birds. 29(1):23-28.

SOIL & WATER RESOURCES

Joe O Hagan and Lorraine White

INTRODUCTION

This section of staff s Preliminary Staff Assessment (PSA) analyzes potential effects on soil and water resource by the Moss Landing Power Plant Project (MLPPP), specifically focusing on the potential for the project to induce erosion and sedimentation, adversely affect surface and groundwater supplies, and degrade ocean, surface and groundwater quality. This preliminary assessment also addresses the project s ability to comply with all applicable federal, state and local laws, ordinances, regulations and standards, identifies mitigation measures and recommends conditions of certification.

Flooding and drainage issues are addresses in the **Facility Design** section of this document. Biological issues associated with cooling water intake and discharge are addressed in the **Biological Resources** section and soil contamination is addressed in the **Waste Management** section of this PSA.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

CLEAN WATER ACT

The Clean Water Act (33 USC/1257 et seq.) requires states to set standards to protect water quality. Point source discharges to surface water are regulated by this act through requirements set forth in specific or general National Pollutant Discharge Elimination System (NPDES) permits. Stormwater discharges during construction and operation of a facility and incidental non-stormwater discharges associated with pipeline and transmission line construction also fall under this act, and are addressed through a general NPDES permit. In California, requirements of the Clean Water Act regarding regulation of point source discharges and stormwater discharges are delegated to and administered by the nine Regional Water Quality Control Boards (RWQCB). For this project, the California Regional Water Quality Control Board, Central Coast Region will issue a new NPDES permit for the project that will regulate point and stormwater discharges during operation. A separate general construction activity permit will be required.

Section 316 [33 U.S.C. 1326] of the Clean Water Act specifically addresses thermal discharges and cooling water intake structures. Subsection (a) provides that the owner or operator of any such source can demonstrate to the satisfaction of the the State that any effluent limitation proposed for the control of the thermal component of any discharge from such source will require effluent limitations more stringent than necessary to assure the projection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into

which the discharge is to be made the State may impose an effluent limitation that will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on that body of water.

Subsection (b) requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact .

Section 404 of the act regulates the discharge of dredged or fill material into waters of the United States, including rivers, streams and wetlands. Site specific or general (nationwide) permits for such discharges are issued by the Army Corp of Engineers (ACOE) and are certified by the RWQCBs under section 401 of the Act.

RIVERS AND HARBOR ACT OF 1899 (AS AMENDED):

Section 10 of the River and Harbors Act regulates work in navigable waters of the United States and is enforced by US Army Corps of Engineers. Repair, rehabilitation and or replacement of structures that had prior authorization or permits are addressed in Rivers and Harbors Act Section 10, 33 USC 40 et seq., 33 USC 1344, 1413; 33 CFR Part 330.3 and applies to modification of intake and outfall structures. Such work requires a Nationwide Permit no. 3 from the US Army Corps of Engineers. Rivers and Harbors Act Section 10, 33 USC 403; 33 CFR Part 322 provides for temporary structures, work and discharges associated with construction activities, access fills or dewatering to minimize impacts on aquatic resources. Such work requires a Nationwide Permit no. 33 issued by the Corp.

STATE

PORTER-COLOGNE WATER QUALITY CONTROL ACT

The Porter-Cologne Water Quality Control Act of 1967, Water Code section 13000 et seq., requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards and implementation procedures. These criteria for the proposed project are contained in the Central Coast Region Water Quality Control Plan (Basin Plan 1994), the California Ocean Plan (1997) and the Thermal Plan (1975).

STATE WATER RESOURCES CONTROL BOARD POLICIES

The SWRCB has also adopted a number of policies that provide guidelines for water quality protection. The principle policy of the State Board which addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling (adopted by the Board on June 19, 1976 by Resolution 75-58). While this policy specifically discourages the use of fresh inland waters for power plant cooling, it does give priority to the use of ocean water for this purpose.

The principal policy of the State Board which addresses enclosed bays and estuaries is the Water Quality Control Policy for the Enclosed Bays and Estuaries

of California (adopted by the Board on May 16, 1974 by Resolution 74-43). This policy contains a number of prohibitions on waste discharges including chemical, biological and petroleum related waste.

STATE WATER RESOURCES CONTROL BOARD PLANS

CALIFORNIA THERMAL PLAN

In 1972, the State Water Resources Control Board adopted the Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California , more commonly known as the Thermal Plan. The Thermal Plan, which was later amended in 1975, sets limits on the discharge of wastewaters with elevated temperatures into coastal, estuarine and interstate waters in order to meet water quality objectives. A major aim of the Thermal Plan is to protect marine resources in the ocean, enclosed bays and estuaries from the adverse impacts of thermal waste.

Thermal waste is defined as cooling water and industrial process water used to carry waste heat from such large point sources as power plants. Two categories of discharges exist: existing which are discharges in place or under construction prior to the plan s 1971 adoption and new which are discharges developed after the plan was adopted. The proposed project is considered a new discharge under the Thermal Plan by Energy Commission and RWQCB staff (Thomas 1999;2000). The project will be discharging to the existing outfall located in Monterey Bay. Under the Thermal Plan, Monterey Bay is considered to be coastal waters.

Therefore, specific water quality objectives in the Thermal Plan applicable are:

Elevated temperature wastes shall be discharged to the open ocean away from the shoreline to achieve dispersion through the vertical water column.

Elevated temperature wastes shall be discharged a sufficient distance from areas of special biological significance to assure the maintenance of natural temperature in these areas.

The maximum temperature of thermal waste discharges shall not exceed the natural temperature of receiving water by more than 20° F.

The discharge of elevated temperature wastes shall not result in increases in the natural water temperature exceeding 4° F at (a) the shoreline, (b) the surface of any ocean substrate, or (c) the ocean surface beyond 1,000 feet from the discharge system. The surface temperature limitation shall be maintained at least 50 percent of the duration of any complete tidal cycle.

Additional limitations shall be imposed when necessary to assure protection of beneficial uses.

The Thermal Plan provides the authority for the RWQCB to grant exceptions to the specific water quality objectives in accordance with Section 316(a) of the Clean Water Act. Such exemptions also require the approval of the SWRCB.

CALIFORNIA OCEAN PLAN

In 1997, the SWRCB (Resolution 97-026) adopted the latest version of the Water Quality Control Plan for Ocean Waters of California (California Ocean Plan). The California Ocean Plan establishes beneficial uses and water quality objectives for the state s ocean waters outside of enclosed bays, estuaries and lagoons. The plan also sets forth effluent limitations, management practices and prohibitions. Every three years the plan is reviewed and, if necessary, updated.

CALIFORNIA COASTAL ACT OF 1976 (PUB. RESOURCES CODE/30000 ET SEQ.)

Chapter 3. Coastal Resources Planning and Management Policies. Article 4. Marine Environment. Section 30231. This section requires that the biological productivity and the quality of coastal waters, wetlands, estuaries and lakes shall be maintained by minimizing adverse effects of wastewater discharges and entrainment, controlling runoff, preventing depletion of groundwater

LOCAL

Monterey County-Regulations for Development in the North County Land Use Plan Area-Chapter 20.144: Section 20.144.070-
Water Resources Development Standards-These regulations set forth standards, including the development of erosion control and hydrologic reports for new development.

Water Service Policy from the Monterey County General Plan (1982), Chapter IV, Area Development: Policy 53.1.3 states that Monterey County shall not allow water-consuming development in areas that do not have proven adequate water supplies.

Monterey County Coastal Implementation Plan (Chapter 20.144) which requires, for expanded wastewater discharges, "tests of ocean waters at the proposed discharge site and surrounding waters to establish baseline or background levels of various water quality parameters no more than 1 year prior to submittal of the˚proposal."

Monterey County Grading Ordinance sets forth grading requirements.

ENVIRONMENTAL SETTING

TOPOGRAPHY AND SOILS

The 239-acre MLPPP site is located inland approximately one-quarter mile from the edge of the Pacific Ocean adjacent to Monterey Bay in Central California. Forming a barrier from the Central Valley, the Coast Ranges lie several miles to the east. MLPPP is located in the Salinas River Basin, a broad alluvial plain between the Salinas River and Elkhorn Slough. The project vicinity consists of industrial development, recreational beaches, dunes, tidal wetlands, and agricultural lands.

Located in DWR Hydrological Unit 18060011, the sites is bounded by the Moss Landing Harbor to the west, the Elkhorn Slough and the Elkhorn Estuarine Research Reserve to the north, agricultural lands to the east and the Moro Cojo Slough to the south (CPUC 1997). The power plant site is relatively flat with an elevation of approximately 30 feet above mean sea level. In 1986, the Federal Emergency Management Agency determined that the site was outside the 100-year flood plain (Duke Energy 1999a)

The site is underlain by a thick series of westerly dipping beds of sand, silt and clay. Major soil types in the project area include Elkhorn fine sandy loam, Oceano loamy sand, Santa Ynez fine sandy loam, and Dune land (DEML 1999a) While Dune land is highly susceptible to wind-induced erosion, the other soils are reported to have only a slight to moderate erosion hazard rating to wind-induced soil erosion (DEML 1999a). Some artificial fill has been deposited on the site consisting of clayey sands and native silty sands in the upper 3-12 feet below grade (PG&E 1996).

Land uses in the vicinity of MLPPP include agriculture (cattle grazing, cropland), open space/wildlife habitat (including Elkhorn Slough National Estuarine Research Reserve), and marine-related uses. The site is currently zoned heavy industrial by the Monterey County General Plan.

HYDROLOGY

Temperatures in the area are mild, ranging between 40-70 degrees ^{o}F, although summer maximums can reach 90 ^{o}F. Average annual rainfall at the site is nearly 30 inches, with most rainfall occurring between November and April. The 24-hour one-year storm event is measured at 3.6 inches (PG&E 1996). Prevailing winds are from the west in the winter, from the east in the summer, and variable during the spring and fall (PG&E 1996; Duke Energy 1999a).

GROUNDWATER

Four water-bearing formations exist below MLPPP. Forming the uppermost hydrologic unit, the marine terrace and alluvial deposits are of poor water quality and occur up to 200 feet below the surface. Aromas Reds Sands consisting of well-sorted sands and gravels with thin clay interbeds is the major water-bearing unit in the area. This formation occurs between 200 to 800 feet below the surface with variable water quality. Below this formation is the Purisima Formation occurring at a depth of 800 to at least 1,200 feet The lower-most hydrologic unit, Tertiary sediment, is comprised of consolidated marine sediments of sandstone, siltstone and mudstone underlain by granite bedrock. The tertiary sediment is of poor water quality and is characterized by high salinity.

The groundwater table at the site occurs about 3.6 to 9 feet below the surface with flow converging from the northeast and southeast into a western trending potentiometric trough beneath the plant. The thick clay layer underlying Elkhorn Slough forms a major barrier to groundwater flows in the area. In its 1996 assessment, PG&E suggested that this trough might be related to pumping in the area. The groundwater gradient is relatively flat (0.0019 ft/ft to 0.0043 ft/ft). Surface

water and precipitation infiltration, irrigation return flows and water-bearing formations that underlie the uplands east of the plant are the major sources of groundwater recharge in the project vicinity (PG&E 1996;Duke Energy 1999a). Saltwater intrusion due to groundwater pumping and poor well construction is a problem in the Moss Landing area.

Onsite wells were tested to determine the transmissivity of the aquifer. Two shallow test wells were installed and the maximal pumping rate for these wells was determined. As a result of the tests, a transmissivity value of 14,035 $ft.^2$/day and storativity of 0.004 were calculated. This indicates a highly transmissive formation that is unconfined to semi-unconfined (AFC pg. 6.5-14).

SURFACE WATER

Surface water bodies in the vicinity of the project include Monterey Bay, Elkhorn Slough, Moro Cojo Slough and Moss Landing Harbor. Beneficial uses of these water bodies identified by the RWQCB (1994) are identified in **Soil & Water Resources Table 1**.

MONTEREY BAY

Located along California s Central Coast, Monterey Bay is about 26 miles long and 10 miles wide. Deep ocean currents driven by seasonal winds cause an upwelling of cold water in the bay and the near-shore currents result in a high degree of circulation in the Moss Landing area (Duke Energy 1999a). Subject to variations, the semidiurnal tides have a mean range of 3.6 feet and diurnal range of 5.3 feet (Duke Energy 1999a). Ocean and bay waters are typically 45 ^{o} and 60 ^{o} F (PG&E 1996).

Water quality information on Monterey Bay is available from a variety of sources including the Central Coast RWQCB and the National Oceanic and Atmospheric Agency. To meet Monterey County Local Coastal Plan requirements, Duke Energy will be conducting water quality analysis of source water taken from in front of the cooling water intake, adjacent to the cooling water discharge location in the bay and a location farther out into the bay. Constituents sampled include pH, oil and grease, total suspended solids, metals and organics considered a threat to marine aquatic life and human health. Analyses will be to the parts per billion (ppb) or lower, as required.

SOIL & WATER RESOURCES TABLE 1
Surface Water Beneficial Uses

	Moss Landing Harbor	Elkhorn Slough	Moro Cojo Slough	Monterey Bay*
Water contact recreation	●	●	●	●
Non-contact water recreation	●	●	●	●
Industrial water supply	●			●
Navigation	●	●		●
Marine habitat	●	●		●
Shell fish harvesting	●	●	●	●
Commercial and sport fishing	●	●	●	●
Preservation of rare and endangered species	●	●	●	●
Wildlife habitat	●	●	●	●
Warm fresh water habitat		●	●	
Cold fresh water habitat		●	●	
Migration of aquatic organisms		●		
Spawning, reproduction or early development		●	●	
Preservation of biological habitat of special significance		●	●	
Estuarine habitat		●	●	
Aquaculture		●		
Ground water recharge			●	

Source: SWRCB Water Quality Control Plan, Central Coast Region, 1994.
*Soquel Pt. To Salinas River

ELKHORN SLOUGH

One of the four major tributaries that flows into Monterey Bay, Elkhorn Slough is approximately 6 miles long and 300 feet wide at its mouth narrowing as it travels inland. The slough s watershed is approximately 43,000 acres. It is a shallow estuary, decreasing in depth from 16 feet at the mouth to 3.3 feet inland. The Slough is subject to tidal influences for approximately half its length. Near the slough are marshes and mud flats, representing only 10 percent of the wetlands present in the 1880s. At the outlet of the Slough to the Bay, the channel is maintained and a man-made harbor, Moss Landing Harbor, extends to the south in what was the Old Salinas River channel. The harbor is regularly dredged.

EXISTING MOSS LANDING POWER PLANT SITE

Duke Energy has proposed to repower and modernize the existing Moss Landing Power Plant that was formerly owned by Pacific Gas and Electric (PG&E). The PG&E site occupied 380-acres and consisted of 19 fuel oil storage tanks, 7 generating units, 10 exhaust stacks, 2 seawater intakes and outfalls, wells, buildings and related equipment (DEML 1999a). Operation of the first three units by PG&E began in 1950 with Units 4 & 5 starting operation in 1952. Units 1 through 5 had a net capacity of 1,478 MW. These five units have not operated since January 1995 and cannot operate since PG&E surrendered the air quality permits for these units in 1997 (Suwell 2000). Units 6 & 7, still operating, came on line in 1968. Each of these two units has a net capacity of 739 MW or a total of 1,478 MW. Duke Energy acquired the power plant site in 1998. PG&E have retained ownership of its adjacent 140-acre Moss Landing Substation north of the plant.

PG&E operated the Moss Landing Power Plant under a NPDES permit last reissued in 1995 (No. CA0006254) by the Central Coast RWQCB (Order No. 95-22). Although Units 1 through 5 have not operated since January 1995 and can not operate without new air quality permits, the NPDES permit provides discharge limitations for Units 1 through 5. Duke is currently operating Units 6 & 7 under this NPDES permit, which expires February 1, 2000. Duke Energy (Hoffman 1999) has requested a two-year extension of the permit until the certification process is completed. A new, final NPDES permit will be issued for the facility following certification of the project (Thomas 1999). A draft permit is anticipated in late February (Thomas 2000).

The cooling water intake structure for Units 6 & 7 is located on the eastern shore of Moss Landing Harbor, 700 feet south of the Unit 1 through 5-intake structure. Spent cooling water is discharged approximately 600 feet offshore in Monterey Bay. Permitted discharge limits cannot exceed 890 million gallons per day. The average daily temperature limitations are 28° F above the temperature of the water intake. During heat treatment of the conduit to remove mussels, the daily temperature of the discharge can not exceed the average daily temperature of the intake water by 40° F.

Duke Energy has recently discovered that they exceeded their discharge limitation several times last year due to high operation levels, jelly fish clogging the screens and other factors (RWQCB 2000). The 28° F thermal limitation was apparently exceeded by 2° F. In addition, Duke detected non-permitted discharges from the Moss Landing facility. These involved high temperature discharges to Moss Harbor resulting from backflushing of heated water to clear the cooling water intake structure of marine organisms. Water temperatures of as high as 98° F were detected in the harbor. Duke will discontinue all backflushing and will only conduct manual cleaning of the cooling water intake structure.

In addition, effluent limitations for the Units 6 & 7 discharge are specified for a variety of constituents to protect aquatic life and human health. The NPDES permit allows stormwater runoff to be discharged to Elkhorn Horn Slough, Moro Cojo Slough and Monterey Harbor. Currently there are three permitted hazardous waste

surface impoundments at the existing power plant. These impoundments are permitted by the RWQCB for Waste Discharge Requirement for Class I Waste Water Surface Impoundments. The Board (Schwartzbart 2000) just recently renewed this permit. According to RWQCB staff, the ponds are in good shape and there is no evidence of any contamination or leakage from the ponds to the soil or groundwater (Schwartzbart 2000).

An environmental site assessment of the Moss Landing facility indicated the presence of soil and groundwater contamination (CPUC 1997; Duke Energy 1999a; Levine Fricke 1999). PG&E retains all liability for soil and groundwater contamination at the sites resulting from on-site PG&E activities (CPUC 1997). For more information on soil contamination please refer to the **Waste Management** section of this document. Chromium, petroleum hydrocarbons and volatile organic compounds (VOCs) have been identified in groundwater beneath the site. Please see Figure 6.14-2 in the AFC (Duke Energy 1999a) for a map showing the location and concentrations of these contaminants in the groundwater.

WASTE DISCHARGE

Currently, the existing power plant has two structures for cooling water discharge. Outfall 001 (for the retired Units 1-5) discharges off the shore of Elkhorn Slough. Outfall 002 (for the operating Units 6 & 7) discharges into Monterey Bay with two vertical risers about 20 feet below the water surface (Duke Energy 1999a; PG&E 1996). PG&E s last NPDES Permit for the Moss Landing Power Plant was adopted by the RWQCB on February 10, 1995 (CA 0006254 Order No. 95-22, expiration date November 10, 1999).

Stormwater runoff is currently discharged to Monterey Bay, Moro Cojo Slough, Elkhorn Slough or Moss Landing Harbor in accordance with an existing Stormwater Pollution Prevention Plan and NPDES requirements.

ENVIRONMENTAL IMPACTS

PROJECT SPECIFIC IMPACTS

Duke Energy proposes to construct two 530 MW, natural gas-fired, combined cycle, units (Duke Energy 1999a,i). Duke Energy also proposes to upgrade each of the existing Units 6 and 7 by 15 MW through replacing the turbine rotors (Duke Energy 1999b,i). The upgrade of Units 6 & 7 are not a portion of this project and are being addressed by the Monterey Bay Air District (Duke Energy 1999i). These changes will result in an overall generating capacity of 1060 MWs. In addition, eight 225-foot tall stacks associated with Units 1-5 will be removed and replaced with four exhaust stacks for the new turbines. Seven fuel oil storage tanks (120,000 to 165,000 barrels) are located on the eastside of the overall plant site and will be removed (Duke Energy 1999a). Monterey County is conducting the environmental assessment associated with removal of these tanks. The new combined cycle units will be located where the current fuel oil tanks 3, 4 and 10 are located. The project will not require any new transmission lines or natural gas pipelines.

WATER SUPPLY

Ocean and groundwater will supply the proposed project s needs. Cooling water requirements for the project will be met through ocean water taken from the existing Units 1 through 5 intake structure located in Moss Landing Harbor. Duke Energy (1999a,b) is proposing to modify this intake structure, which was constructed in 1949, to meet Clean Water Act 316(b) requirements. The existing traveling screens will be moved from their present location 350 feet up to within 10 feet of the intake structure entrance. The screens will also be inclined to reduce entrainment and impingement. This is discussed further below.

Each of the two proposed combine cycle units will require approximately 125,000 gallons per minute (gpm), for a total of 250,000 gpm (Duke Energy 1999b). In comparison, Units 6 & 7 require a total of approximately 600,000 gpm. This water will be used for steam turbine condenser and auxiliary cooling requirements.

Average daily boiler makeup water demand is estimated to be 92,200 gallons per day (gpd). This volume will consist of 31,700 gpd recovered boiler blowdown and approximately 60,500 gpd of ocean water, which will be desalinated by vapor compression evaporation system followed by a polishing demineralizer.

Impacts associated with the use of ocean water for once-through cooling facilities deal with the entrainment and impingement of aquatic organisms. For further discussion of these issues please see the **Biological Resources** section of this PSA. For discussion of compliance of the proposed project with Clean Water Act cooling water intake structure requirements, please see the discussion under Compliance with Applicable Laws, Ordinances and Standards below.

Fire, service water and domestic water needs will be supplied through groundwater. Potable water is supplied by the Moss Landing Mutual Water Company from wells located to the west of the plant. This water is chlorinated before distribution. During construction, Duke Energy (1999a) estimates 10,000 gpd of drinking water will be required. Duke Energy (1999c) also estimates that annual domestic water demand during operation will be no greater than 1.1 million gallons. Potable water may also be used for maintenance activities on an intermittent basis. Water for fire safety for the proposed combine cycle units will also come from potable water. See Soil & Water Resources Table 2 for the proposed water balance.

Historically, 54,200 gpd of well water was used by the Moss Landing facility (Duke Energy 1999a). This apparently includes groundwater used for plant washdown activities by Units 1 through 5. Duke Energy (1999a) estimates that operation of the proposed project will require 43,000 gpd. Although project groundwater demand is only a small amount, concern about saltwater intrusion requires further analysis of this issue.

WATER QUALITY

Wastewater disposal can lead to soil, surface and groundwater degradation and impairment of beneficial uses.

WASTE WATER DISCHARGE

Duke Energy (1999a) proposes to discharge the spent cooling water from the proposed units to the existing Units 6 & 7 wastewater outfall system. This outfall facility is located approximately 600 feet offshore in Monterey Bay and consists of two 12-foot diameter pipes for each of the two existing units. These pipes terminate in head works that direct the discharge flow towards the surface (Duke Energy 1999c). These head works are roughly 12 feet by 18 feet in cross-section and the tops are located in approximately 20-feet off the bottom and 20 feet below the surface at low mean tide (Duke Energy 1999c). The head works are approximately 18 feet apart. Flows to discharge facility will increase above the current five feet per second to approximately 8.6 feet per second.

Other wastewater discharge streams include the concentrated brine from the evaporator system, boiler blowdown, washwater and others. These waste streams are routed to the three-wastewater treatment ponds where they are neutralized, solids are removed and the wastewater is discharged to Monterey Bay.

Although Duke will not discharge cooling water to Elkhorn Slough, stormwater will continue to be discharged to the slough as permitted by the existing NPDES permit and covered in their SPPP.

Non-hazardous wastewaters, including cooling water, intake screen wash, evaporator blowdown, boiler blowdown, bearing cooling water, stormwater, floor drainwater, demineralization unit bleed, ion exchange washwater will be generated and disposed of via existing outfalls. Other waste streams will be neutralized and routed to the wastewater treatment ponds for further treatment before discharge. Waste streams that may be contaminated by oil are routed through an oil and water separator before discharge. Sanitary waste will be handled by the existing on-site septic systems.

THERMAL DISCHARGE

Duke Energy evaluated the proposed discharge of MLPPP to characterize the future thermal plume and determine whether or not the proposed facility can comply with the California Thermal Plan (Duke Energy 1999m). A study plan was developed by Duke Energy in consultation with the Central Coast Regional Water Quality Control Board. The objective of the study was to determine if the project will comply with the Thermal Plan standards and if there is a potential for interference with larval fish in the vicinity of the discharge (pg. 4). The study was initiated in March 1999. The study also included an assessment of alternatives and modifications that can be made to the project to achieve compliance with the thermal plan. At this time, staff is still evaluating this portion of the study.

The thermal discharge study was based on data collected by stationary temperature recorders placed in the bay, harbor and Elkhorn Slough, aerial thermal imaging, and boat-based temperature measurements at various locations in the Bay. Data collected from the stationary recorders consisted of hourly temperature readings from seventeen permanent and three temporary recorder locations from March to

October 1999. Also used was data for Units 6&7 output (thermal loading) and sea levels during these months.(pg. 13) Boat-based temperature readings for the study were collected at various sites and depths from the point of discharge to well beyond the plume. These measurements were taken at times that coincided with the aerial thermal imaging, six occasions in March and three occasions in July 1999. The empirical data sets produced were used to generate mathematical projections (as opposed to mathematical modeling) to describe current and future plume configurations (pg. 15).

As a result of their study, Duke Energy developed the following plume characterization:

Under worse case conditions, the plume is expected to have surface temperatures 1,000 feet from the discharge that are close to but do not exceed 4° F above receiving water temperatures in the vicinity of the discharge. (pg. vii)

The thermal plume is not expected to exceed 4° F above natural water temperatures at the shoreline, the surface of any ocean substrate, or the ocean surface beyond 1,000 feet from the discharge more than 50 percent of the duration of any complete tidal cycle.(pg. vii)

Maximum thermal plume temperatures will not exceed the natural water temperatures by more than 20° F at any point on the ocean surface based on vigorous mixing around the discharge point.(pg.vii)

Impacts to Moss Landing Harbor and Elkhorn Slough from the heated discharge plume are expected to remain insignificant because of natural heating and tidal variations absent the direct discharge to Elkhorn Slough.(pg.vii)

After reviewing the study, staff raises the following concerns about the underlying study assumptions and the applicant s conclusions. First, the differences in temperature between the waste discharge from the plant and the receiving waters of the bay were made using harbor temperatures (taken at the intake), not ambient bay temperatures. Measured background temperatures for the receiving waters were assumed to be consistent with that of the intake water taken from Moss Landing Harbor. This assumption under-estimates the differences in temperature. As shown in the Figures 2-7 & 2-8 of the study, net bay temperatures are notably lower than Harbor and Slough temperatures. For example, bay temperatures ranged from approximately 53/54° F as a low to 57/58° F for a high. Harbor temperatures, on the other hand, ranged from a low of 56/57° F to 70° F as a high (measured on July 4, 1999 at intake 6 & 7 with no load). Also, as shown in Figure 2-17, the survey boat reported reference temperature measurements in the Bay taken on July 26 and 27, 1999 between 55° and 60° F at 20 feet below the surface.

Harbor and Elkhorn Slough water temperatures were shown to be correlated more with fluctuations in sea level and more influenced by solar heating at the surface (as shown by floating recorders) than those in the bay. Ocean stations around the discharge point showed very high correlation with the power plant load and weak

correlation to sea level. Therefore the temperature at the intake can not be assumed to be similar to that of the receiving waters in the bay because of differences in depths, tidal influences and solar heating of the two water bodies.

Secondly, staff believes that the applicant has under-estimated the operating profile for Units 6 & 7 in the maximum heat loading worse-case analysis. The operating assumption for Units 6 & 7 offered in the report (50 percent of the time at 80 percent load, which is a 40 percent capacity factor) is inconsistent with what Duke Energy is requesting the air district to permit Units 6 & 7. Duke energy has requested the district to approve an 80 percent capacity factor for the first two quarters of the year and 100 percent capacity factor for the last two quarters of the year (Sewell 2000). Capacity factor refers to the actual operating levels of the power plants. The AFC (Duke Energy 1999a) states that Units 6 & 7 are expected to operate at a 40 percent capacity factor, but on page 2-18 gives the overall plant availability to be 92-96 percent. If a higher capacity factor is permitted by the district, the maximum heat loading will be 850,000 gpm over more of the time than is represented by the future average flow rate reported in Table 1-2 (525,000 gpm). A reasonable worse case analysis is both the proposed units and Units 6 & 7 operating for 100 percent of the time. This will have the effect of a larger plume, a greater thermal effect and a longer duration than is represented in the report. If the plume is larger, higher temperature water may encroach onto the beaches and extend beyond the 1,000 feet limit.

A third staff concern is that the velocity of the waste water discharge into Monterey Bay will increase the from the current 5 feet per second to 8.6 feet per second (Duke Energy 1999c). This increase in discharge velocity should change the vertical profile of the plume and may influence the ocean substrate in the vicinity of the discharge. It may also result in an increase in the horizontal extent of the plume as well.

Recent operation of the existing Units 6 & 7 has resulted in violations of existing permit limitations. The report concludes that the new project will meet the 20 ^{o} F restrictions most of the time because 1) Units 6 & 7 will not be run more than 40 percent of the time, and 2) the discharge from the new combined cycles will be mixed with that of Units 6 & 7 for a net reduction in temperature of 2.4 ^{o} F. However, if the old units are run more frequently and they already exceed limits by more than 2.4 ^{o} F, the added cooler discharge will not avoid violations.

There are other points to consider in evaluating potential impacts of the thermal discharge of the MLPPP. In measuring surface temperature differentials, the applicant used recorded temperatures collected from the boat surveys and reference locations. In taking these measurements, it was observed that movement of the boat through the water churned up cooler waters from below the surface. This could have effected measured surface temperatures over a period of time (page 28 and Figures 2-10 and 2-11). Also, the estimated position accuracy is about 100 feet and may help to explain unexpected temperature measurements around the discharge (page 40). Units 1-5 were retired in 1995 (prior to Duke Energy taking ownership of MLPPP) and have not been a source of thermal discharge to Elkhorn

Slough in recent history. Additional discharges from this project are considered a new source and should not be compared to a discharge (from Units 1-5) that does not exist. Also, the flow rate for Units 6 & 7 s intake will not change; it will continue to be 0.8 fps. Flow rate for Unit 1-5 s intake will be decreased only slightly from 0.7 fps to 0.5 fps to serve the needs of the new combined cycle units. The maximum volume of water being discharged to the bay will increase over historical amounts as a result of combining the two flows. This will have a net effect of a greater sized plume at a higher temperature over a longer duration. Based on the above observations, staff does not agree with the applicant s conclusions and believes that the project will not comply with any of the specified requirements of the California Thermal Plan.

Intake Modifications

Duke Energy (1999k) submitted a draft Resource Assessment Report that evaluates alternative cooling water intake designs with respect to Section 316(b) of the Clean Water Act. This section of the act requires that the location, design, construction and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

The alternative technologies evaluated generally included:

1. Offshore and onshore intake locations/configurations.
2. A once-through cooling water system
3. Various behavioral barriers, which include light, sound, bubble screens, and velocity caps.
4. Diversion systems
5. Physical barriers.
6. Fish collection, removal, and conveyance systems.
7. Operational and flow-reduction alternatives.

A hierarchical evaluation system of four criteria using a site specific approach was applied to assess which alternative intake technologies are both feasible and would reduce biological losses:

1. The alternative technology is available and proven.
2. Implementation of the alternative technology will result in a reduction in the loss of aquatic organisms compared to present conditions.
3. Implementation of the alternative technology is feasible at the Moss Landing Power Plant Project (MLPPP) site.
4. The total economic cost of the alternative technology is proportional to the environmental benefits.

The four criteria were applied progressively such that only alternative technologies that met the previous criterion were evaluated under the next criteria, e.g., if a alternative did not meet the first criterion it was eliminated from evaluation under the next and remaining criteria.

Of the alternatives included above, only those involving operational and flow-reduction alternatives, and those involving behavioral barriers met the first criterion, were considered proven technology by Duke Energy, and were further evaluated under the remaining criteria.

Several alternatives were not considered likely to result in a reduction in the loss of aquatic organisms compared to present conditions. The Applicant considered both onshore and offshore alternative intake locations, and behavioral barriers not acceptable. Entrainment and impingement losses were not expected to be substantially reduced through the use of physical barriers, which include travelling screens, barrier nets, a Gunderboom, and a fish pump system. Cooling system changes and discharge temperature regulation were not expected to substantially reduce entrained organism mortality, and were also rejected from further consideration.

The remaining alternatives were evaluated against the feasibility and cost analysis criterion. Curtailment of power generation, mechanical draft and natural draft cooling options, air-cooled condenser (dry cooling) reduced cooling water flow at reduced loads, and alternatives to chemical biocides were eliminated based on either cost or feasibility.

Duke Energy concluded that the currently proposed design is the best technology available to reduce entrainment and impingement of aquatic organisms. The Applicant recommends continuing present operating practices, that include reducing the operation of circulating water pumps when the units are out of service for extended periods of time, and periodic dredging around intakes to reduce sediment accumulation in intake areas to maintain intake water velocities.

At this time, staff can not concur with the applicant s conclusions and recommendations. Staff will continue to evaluate alternatives to the proposed cooling water intake structure. Full evaluation of alternatives, however, can only take place following completion of the entrainment evaluation.

EROSION CONTROL AND STORM WATER MANAGEMENT

Accelerated wind and water induced erosion may result from earth moving activities associated with construction of the proposed project. Removal of the vegetative cover and alteration of the soil structure leaves soil particles vulnerable to detachment and removal by wind or water. Significant precipitation typical of California s coastal region may increase the potential for water erosion. Grading activities may redirect runoff into areas more vulnerable to erosion.

Upgrades to Units 6 & 7 will occur within the boundaries of the existing 10-acre site at the southwest portion of MLPPP. Soils in the area of the tank removal where the new combined cycle units are to be located are the Elkhorn loams and Santa Ynez loams. These soils have obviously been significantly modified by construction activities. Once the protective covering of the soil has been disturbed during project construction, these soils can be highly vulnerable to erosion.

Because of previous activities and uses at the site, it is essentially flat with little grading required. Demolition of the existing tank farm is part of a separate project under the jurisdiction of Monterey County. Existing grades and slopes in the tank farm areas will be maintained and existing swales and culverts will be used to divert surface run-off. See Figure 6.3-4 in the AFC (Duke Energy 1999a) and Figure ML-1 in Duke Energy (1999e). The finished grade will be approximately 20 msl. Surface drainage will primarily be gravity flow accomplished with a mild slope away from structures of about 2 percent and a minimum of 1 percent (AFC pg. 2-26). Site preparation for the construction laydown area and for construction of the new combined cycle units will result in new temporary and permanent disturbances. No new offsite linear facilities will be needed to serve the project. Staff submitted data request no. 39 (CEC 1999b) to Duke Energy that asked for a draft erosion control and stormwater management plan for both construction and operation. In response, Duke Energy (1999i) submitted a copy of the existing Stormwater Pollution Prevention Plan (SWPPP) for the operation of the facility and plot plans showing proposed drainage patterns. This, however, does not completely address the potential for erosion and sedimentation and the discharge of contaminated stormwater runoff during construction. Duke Energy will have to provide additional information on this subject before staff can complete their analysis.

During project operation wind and water action can continue to erode unprotected soils. A net increase in the amount of impervious surfaces at the site will occur and may increase the amount of stormwater runoff from the site (Duke Energy 1999a). Unprotected soils may be eroded as a result of this increased run-off. Onsite drainage will be gravity flow whenever possible accomplished through mild slopes and existing culverts. The graded areas will have approximately a 2 percent slope away from structures. Site drainage facilities and ditches will be designed for 100-year, 24-hour rainfall. As proposed, the majority of surface drainage will be directed to the outfall in Monterey Bay. Stormwater run-off from industrial areas, roof drains and storm drains will be directed to an oil/water separator prior to being combined with the cooling water discharge (Outfall 002). Stormwater from roads and parking lots will be routed directly to Moss Landing Harbor via existing structures (Outfall 004). Plant modifications will include a small reduction in the amount of surface drainage directed to Elkhorn Slough via the existing Outfall 001 and Moro Cojo Slough via the existing Outfall 003 (Duke Energy 1999a, Figures 6.5-3 & Figure 6.5-20).

As noted above, the existing SWPPP addresses pollutant sources that may affect stormwater quality and control measures and management practices to reduce pollutants in stormwater run-off. Duke Energy has indicated that it will design and construct the new facilities in conformance with the existing SWPPP or if necessary,

seek amendments to the plan to reflect specific project components and pollution prevention practices (Duke Energy 1999a).

To supply cooling water to the proposed project, Duke (1999a,b) intends to modify the existing Units 1 through 5 cooling water intake facility. This includes: moving the traveling screens closer to the intake; using incline instead of vertical screens, installing new stop log guides; replacement of the silt diversion structures; modification of the inlet tunnel to allow for thermal treatment; and removal of collected sediment from the entrance of the intake structure (Lynch 1999). This will require:

- Construction of a coffer dam around the front of the intake structure to dewater the facility.
- The water will be pumped back into the harbor.
- Sediment to be removed will be sampled for contamination, and disposed of based on the sample results.
- The existing bar racks and stop logs will be replaced.
- A new silt diversion system will be inserted.
- Pumping will stop and the coffer dam will be removed.

The Army Corp of Engineers (Grass 1999) gave permission for Duke Energy to install a sheet pile cofferdam into Moss Landing Harbor to allow dewatering of the cooling water inlet structure to remove silt accumulations, relocate the traveling screens, install new stop log guides, replace the silt diversion structures, and modify the inlet tunnel.

According to Duke Energy, siltation periodically occurs around the existing intake structure for the retired Units 1-5 in Elkhorn Slough. The applicant proposes to replace silt diversion panels and continue practices of periodically clearing the build-up away. Staff has no information on the anticipated frequency of such sediment removal activities.

CUMULATIVE IMPACTS

To be completed in the Final Staff Assessment.

FACILITY CLOSURE

To be completed in the Final Staff Assessment.

MITIGATION

APPLICANT PROPOSED MITIGATION

To be completed in the FSA.

CEC STAFF PROPOSED MITIGATION

Staff is not proposing any mitigation measures at this time.

COMPLIANCE WITH APPLICABLE LORS

Duke Energy has applied to the Central Coast RWQCB for a NPDES permit for the new combined cycle units. The RWQCB (Thomas 1999) has determined that the proposed project constitutes a new facility under the Thermal Plan and a new discharge under the Clean Water Act. To meet these requirements, the RWQCB staff laid out a number of studies Duke Energy must undertake to provide information necessary for the RWQCB to determine the project s compliance with the Thermal Plan and Section 316(b) of the Clean Water Act. The applicant is required to utilize best technology available to minimize potential once-through cooling water impacts on biological resources.

As discussed above under this plan, the thermal discharge of a new facility into coastal waters must meet several requirements including not exceeding a maximum temperature of 20° F above the receiving water. Under provisions of the Thermal Plan and Clean Water Act Section 316(a), the RWQCB and the SWRCB can issue a variance to these specific plan objectives. Duke Energy (Thomas 2000) has requested a variance for the 20° F limitation. This allows Duke Energy to discharge at greater temperature relative to receiving water ambient levels as long as the discharge levels will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on that body of water. RWQCB staff (Thomas 2000) feel that the studies being conducted now by Duke Energy will suffice in this determination and should not require additional time beyond that necessary for completing and analyzing the survey information. Therefore, the thermal limit for the discharge will be based upon potential biological impacts. Such an analysis must wait the completion of Duke Energy s ongoing studies.

If Duke Energy wishes a variance from other specific objectives of the Thermal Plan, such as the discharge not resulting in temperature increases exceeding 4° F at the shoreline over 50 percent of the tidal cycle, this will require a separate variance.

Duke Energy has submitted several working drafts of the Evaluation of Proposed Discharge System with Respect to the Thermal Plan. Staff is participating with the RWQCB and Duke Energy in a technical advisory group reviewing this and other documents. As discussed above, Duke Energy (1999j) provides a discussion of alternative design and operational factors to minimize thermal impacts. Full evaluation of these alternatives must await completion of the biological impact analysis.

In addition to the thermal studies, the RWQCB must evaluate whether Duke Energy is proposing to use the best technology available to minimize adverse impacts. As discussed above, Duke Energy (1999k) has identified alternative approaches to minimize entrainment and impingement. Determination of best technology available for cooling water intake must wait for completion of the 316(b) studies.

The RWQCB plans to release a draft NPDES for the project late in February 2000. Although the draft permit will be helpful to Energy Commission staff in their analysis of the proposed project, evaluation of potential impacts of the project and the project s compliance with the Thermal Plan and Clean Water Act must await completion and analysis of the ongoing studies.

CONCLUSIONS AND RECOMMENDATIONS

Staff is not able to recommend approval of the proposed MLPPP for the technical area of Soil and Water Resources at this time. This is because of several outstanding issues and concerns that staff have regarding the proposal and the need for additional information in order to complete staff s analysis. In particular, outstanding items include: the potential for the project to contribute to salt water intrusion of groundwater supplies in the area; non-compliance of the project with Thermal Plan requirements; the need to complete our evaluation of alternatives to the proposed cooling water intake structures; and the lack of information on construction related erosion, sedimentation and stormwater controls and sediment removal activities for the intakes of Units 1-5.

CONDITIONS OF CERTIFICATION

No conditions of certification are proposed now. This will be proposed in the Final Staff Assessment.

REFERENCES

CPUC (California Public Utilities Commission) 1997. "Mitigated Negative Declaration and Initial Study, California Public Utilities Commission, Pacific Gas and Electric Company's Application No. 96-11-020 Proposal for Divestiture", Environmental Science Associates, August 25, 1997.

Duke Energy (Duke Energy Moss Landing LLC). 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.

Duke Energy (Duke Energy Moss Landing LLC). 1999e. Second set of Data Responses, dated November 22, 1999.

Duke Energy (Duke Energy Moss Landing LLC). 1999f. Draft Thermal Studies, Section 316(b), dated ????.

Duke Energy (Duke Energy Moss Landing LLC). 1999j. Supplemental Data Adequacy Information Request, Moss Landing Power Plant Project. Prepared by TENERA.

Duke Energy (Duke Energy Moss Landing LLC). 1999i. Moss Landing Power Plant. Responses to California Energy Commission Data Requests of 10/20/99. Submitted by Duke Energy Moss Landing, LLC. November 22, 1999.

Duke Energy (Duke Energy Moss Landing LLC). 1999i. Supplementary Filing — Moss Landing Power Plant Application for Certification. Submitted to the California Energy Commission, November 22, 1999.

Duke Energy (Duke Energy Moss Landing LLC). 1999k. Responses to California Energy Commission (CEC) Data Requests of 10/20/99, attachment 1, Moss Landing Power Plant Project (99-AFC-4). Submitted to the CEC, November 22, 1999.

Duke Energy (Duke Energy Moss Landing LLC). 1999l. Moss Landing Power Plant Modernization Project Cooling Water Intake and Discharge Study Plans. Prepared by Tenera Energy. Submitted to the California Energy Commission, November 19, 1999.

Duke Energy (Duke Energy Moss Landing LLC). 1999m. Moss Landing Power Plant Modernization Project — Evaluation of Proposed Discharge System with Respect to the Thermal Plan. Working Draft. Submitted to the California Energy Commission, December 31, 1999.

Duke Fluor Daniel. Submitted to the CEC, July 21, 1999. Includes Marine Biological Resources and Cooling Water Report in Response to the CEC's Data Adequacy Comments, July 16, 1999.

PG&E (Pacific Gas and Electric) 1996. "Proponent's Environmental Assessment Pacific Gas and Electric company's Proposed Sale of Four Generating Plants", Application of Pacific Gas and Electric Company for Authorization to Sell Certain Generating Plants and Related Assets Pursuant to Public Utilities Code Section 851, November 15, 1996.

SWRCB (State Water Resources Control Board) 1998. "Review of the California Thermal Plan (Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California), Initial Staff Report, State Water Quality Control Board, July 1998.

Thomas, Michael. 1999. Water Quality Control Engineer. Central Coast Regional Water Quality Control Board. Various.

Thomas, Michael. 2000. Water Quality Control Engineer. Central Coast Regional Water Quality Control Board. January 27.

Hoffman 1999. Letter to R. Briggs, Regional Water Quality Control Board, Central Coast Region, from Wayne Hoffman, Duke Energy-North America, September 28, 1999: plant is currently regulate by NPDES permit CA0006254 issued to PG&E and adopted by the Regional Board on February 10, 1995. In this letter, Duke informed Briggs that they had notified the Board of the change in ownership and were requesting a two-year extension of the current permit to allow for the new plant to be incorporated.

GEOLOGY AND PALEONTOLOGY

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. 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 Moss Landing Power Plant Project (MLPPP 1999a). A brief description of the LORS for paleontological resources, geological hazards and resources, and drainage and erosion control follows:

FEDERAL

There are no federal LORS for geological hazards and resources, or grading and erosion control. The United States Bureau of Land Management (BLM) requires an excavation permit for excavations and grading on land under their jurisdiction. The Moss Landing Power Plant Project (MLPPP) is not located on lands under the jurisdiction of the BLM. Therefore, there are no federal LORS with respect to geological hazards or resources, or paleontological resources, that are applicable to this project.

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.

The Standard Procedures, Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources (SVP) 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 project is located near the east side of Moss Landing Harbor and within the limits of the existing Moss Landing Power Plant and related properties, in Monterey County. Other nearby surface water bodies include the Elkhorn Slough to the north of the site the Old Salinas River Channel which is southwest of the site, the Moro Slough which is south of the site, Bennett Slough which discharges into Moss Landing Harbor in the Northeaster corner of the harbor, and Monterey Bay west of Moss Landing Harbor. Geology of the site is made up of several earth units and fill. The earth units found at the site include basin sediments made up of interbedded clay, sand, and silt beds, beach sands, dune sands, wind blown sands, and coastal terrace deposits.

ANALYSIS AND IMPACTS

FAULTING AND SEISMICITY

No active faults are known to cross the proposed power plant footprint or the Pacific Gas and Electric substation located adjacent to the site. 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. The site is located in CBC seismic zone 4 as depicted in CBC Figure 16-2. This calls for a minimum ground acceleration for a project within the zone to be designed to 0.4g (0.4X 9.8 meters per second per second). The closest known fault to the power plant footprint is the Monterey Canyon fault. This fault is located approximately to the 1 mile west of the site. It is not considered to be an active fault. However, if a major earthquake occur on the eastern end of the fault, the project site may experience surface rupture and strong ground shaking should the fault be propagated through the project site. The closest active fault to the site is the Zayante-Vergeles fault which is located approximately 6 miles east-northeast of the fault. This fault is considered to be a minor part of the San Andreas fault system. The project is located within seismic zone 4 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 associated with a magnitude 7.9 earthquake on the San Andreas fault at a distance of eleven miles from the site is 0.36g. Two major earthquakes have affected the site within the last 100 years, the 1906 San Francisco earthquake and the 1989 Loma Prieta earthquake. Surface rupture from the magnitude 8.3 1906 San Francisco earthquake has been reported by the applicant to have been recorded to be in San Juan Bautista, which is located about 12 miles east of the site. No reliable record of the estimated peak horizontal ground acceleration at the site caused by the 1906 San Francisco earthquake is known by Energy Commission staff to exist.

The epicenter of the magnitude 7.1 October 1989 Loma Prieta earthquake was located approximately 18 miles north of the project site. The power plant had a raw water tank damaged and some minor damage to the liner of one of the cooling towers. Six inches of earthquake induced subsidence was also reported to have been observed near the gas metering station. The applicant has indicated that the peak estimated horizontal ground acceleration at the site during the Loma Prieta earthquake was between 0.2 to 0.3g (MLPPP AFC page 6.3-6). However, the Earthquake Engineering Research Institute, May 1990, indicated that the peak horizontal ground acceleration that may have occurred at the MLPPP site was probably closer to 0.39g.

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. During the 1989 Loma Prieta earthquake liquefaction related soil features were reported in the vicinity of the power plant and Moss Landing harbor. The potential for liquefaction at the site is considered to vary from low to high due to the presence of ground water within the upper 10 feet of the soil column, the distribution of loose semi-consolidated to consolidated cohesionless soils that partially make up a portion of the geology at the site, and the potential of moderately high levels of strong ground shaking (0.36g), due to a large earthquake on the San Andreas fault.

Hydrocompaction is the process of the loss of soil volume upon the application of water. The soils at the site are partially saturated soil conditions so that hydrocompaction is not considered to be a significant problem at the power plant location.

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. A ten-foot thick layer of highly plastic clay is located near the existing hazardous waste ponds and the oil-water separator. This unit is considered to be potentially expansive. The applicant has indicated in the ASFC that they will assess the potential for expansive soils during the project geotechnical engineering investigation that is planned to occur prior to establishing the final design for the project.

GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

Energy Commission staff have reviewed the MLPPP AFC, dated May 1999. No geological resources have been identified at the power plant project site. No fossils were observed by Energy Commission staff at the power plant during a site visit on November 9, 1999. No paleontological resources are known to exist at the power plant footprint and the re-powering project construction area. The coastal sand terrace deposits may contain fossils at the site, but none are known to have been encountered. The coastal terrace deposits are considered to be paleontologically moderate sensitivite due to the discovery of a mammoth bone in the deposit near Watsonville. Energy Commission staff concur with the applicant that the basin sediments, coastal dunes, the beach dunes, and the wind blown sand deposits and fill have a low paleontological sensitivity. Therefore, Energy Commission 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 site is located in Federal Emergency Management Agency Flood Insurance Rate Map designation "C" and is not located in a 100-year flood zone. In addition, the site is not in a tsunami run-up zone. Minimum grade for the power plant area will be 1% and all drainage will be directed away from buildings within the footprint. The 100-year 24-hour storm event precipitation amount is 3.5 inches (NOAA 1973). Run-off during a 100-year 24-hour storm event should not overwhelm the capacity of the proposed surface water drainage system.

SITE SPECIFIC IMPACTS

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 MLPP is constructed according to the proposed conditions of certification. This opinion is based on the fact that the site is not known to have significant paleontological or geological resources.

FACILITY CLOSURE

There are three kinds of facility closure. A definition and general approach to closure is presented in the General Conditions section of this document. Facility closure activities are not anticipated to impact geological or paleontological resources. This is due to the fact that no paleontological or geological resources are known to exist at the power plant location. In addition, decommissioning and closure of the power plant should not negatively affect geological or paleontological resources since the majority of the ground disturbed in plant decommissioning and closure would have been disturbed in the construction of the plant. Surface water hydrology impacts will depend upon the closure activities proposed.

MITIGATION

Based upon the literature and archives search, field surveys and the preliminary geotechnical investigation for the project, the applicant has proposed monitoring and mitigation measures to be followed during the construction of the power plant, related natural gas supply line, electrical transmission line, and the waste water pipelines. Energy Commission staff agree with the applicant that there is a low probability that vertebrate fossils will be encountered during construction of the power plant and related features.

The proposed conditions of certification are to allow the Energy Commission Compliance Project Manager (CPM) and the applicant to adopt a compliance monitoring scheme that will ensure LORS applicable to geological hazards, geological and paleontological resources, and surface water hydrology for the project are complied with.

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. To ensure compliance with applicable LORS for geological hazards, geological and paleontological resources and surface water hydrology, staff recommends the adoption of the proposed conditions of certification listed below.

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 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.

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, for the intended use, of the site as affected by geologic factors.

The Final Engineering Geology Report to be completed after completion of grading, as required by the 1998 CBC Appendix Chapter 33, Section 3318.1, shall contain the following: 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 are not in concert with the above requirements, the project owner shall submit another individual s name and qualifications for consideration.

If the approved, designated paleontological resource specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontological resource specialist 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. The owner shall submit to the curation facility a copy of the approved Paleontological Resources Report has been approved by the CPM.

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. Within 15 days of receiving notice from the CPM that the Paleontological Resources Report has been approved, the project owner shall submit a letter to the CPM stating that a copy of the approved Paleontological Resources Report has been transmitted to the curation facility.

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.

The project owner shall include a description of closure activities described above in the facility closure plan.

REFERENCES

Benuska, L. (editor). May 1990. Loma Prieta Earthquake Reconnaissance Report, in Earthquake Spectra, Earthquake Engineering Research Institute, Supplement to Volume 6, Page 210. May 1990.

CDMG (California Division of Mines and Geology). 1994a. Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions.

Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project Plant Project. Submitted to the California Energy Commission, March 3, 1999.

NOAA (National Oceanic and Atmospheric Administration). 1973. Precipitation-Frequency Atlas of the Western United States. Page 71.

SVP (Society of Vertebrate Paleontologists). 1994. Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures. October 1994.

FACILITY DESIGN

Steve Baker, Al McCuen and Kisabuli

INTRODUCTION

Facility Design encompasses civil, structural, mechanical and electrical engineering aspects of the project. The purpose of the Facility Design analysis is to verify that the laws, ordinances, regulations and standards (LORS) applicable to the design and construction of the project have been identified; and that the project and ancillary facilities have been described in sufficient detail, including design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety.

This analysis also examines whether special design features should be considered during final design to deal with conditions unique to the site which could influence public health and safety, environmental protection or the operational reliability of the project. This analysis further identifies the design review and construction inspection process and establishes conditions of certification that will be used to ensure compliance with the intent of the LORS and any special design requirements.

FINDINGS REQUIRED

The Warren Alquist Act requires the commission to "prepare a written Decision . which includes (a) Specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality and assure public health and safety [and] (d)(1) Findings regarding the conformity of the proposed site and related facilities with public safety standards and with other relevant local, regional, state and federal standards, ordinances, or laws (Pub. Resources Code,⁄25523).

SUBJECTS DISCUSSED

Subjects covered in this analysis include:

- Identification of the LORS applicable to facility design;
- Evaluation of the applicant s proposed design criteria, including the identification of those criteria that are essential to ensuring protection of the environment and public health and safety;
- 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

Duke Energy Moss Landing LLC (Duke Energy or the applicant) proposes to construct and operate the proposed 1060-megawatt (MW) Moss Landing Power Plant Project (MLPPP) (Duke Energy 1999h and 1999i). The proposed project will be located at the existing Moss Landing Power Plant site that has been operated by PG&E for almost 50 years. This site is located at the intersection of Highway 1 and Dolan Road, east of the community of Moss Landing near the Moss Landing Harbor. The proposed project will use seawater for once through cooling. For more information on the site and related project description, please see the **Project Description** section.

The project site is located in the northwest quarter of Township 13 South, Range 2 East, San Bernardino Base and Meridian. The site is in seismic zone 4, the highest seismic shaking zone in the country. Additional engineering details of the proposed project are contained in the Application for Certification (AFC), in Appendices 8-3 through 8-8 (MLPPP 1999a).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The applicable LORS for each engineering discipline, civil, structural, mechanical and electrical, are included in the application as part of the engineering appendices, Appendices 8-3 through 8-8, and summarized in Section 7.3, Table 7-1 and Section˚8, Engineering (MLPPP 1999a). A summary of these LORS includes: Title˚24, California Code of Regulations, which adopts the current edition of the California Building Code (CBC) as minimum legal building standards; the 1998 CBC for design of structures; American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code; and National Electrical Manufacturers Association (NEMA) standards.

ANALYSIS

The basis of this analysis is the applicant's proposed analysis methods, construction methods and list of LORS and design criteria set forth in the AFC. Applicable engineering sections include:

Section 1.4.6 Project Schedule
Section 1.4.7 Project Ownership
Section 2Project Description
Section 7Laws, Ordinances, Regulations and Standards (LORS)
Section 7.3 Project Siting, Design and Construction
Section 8Engineering

Appendices

1. Appendix 8-3 Civil Engineering Design Criteria
2. Appendix 8-4 Structural Engineering Design Criteria
3. Appendix 8-5 Mechanical Engineering Design Criteria
4. Appendix 8-6 Electrical Engineering Design Criteria
5. Appendix 8-7 Control Systems Engineering Design Criteria
6. Appendix 8-8 Chemical Engineering Design Criteria

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 8-3 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 (MLPPP 1999a, Section 8, and Appendices 8-3 and 8-4) identifies LORS applicable to the project. The project should be designed and constructed to the 1998 edition of the CBC, and other applicable codes and standards in effect at the time design and construction of the project actually commence. In the event the design of MLPPP is submitted to the Chief Building Official (CBO)[1] for review and approval when the successor to the 1998 CBC is in effect, the 1998 CBC provisions, identified herein, shall be replaced with the applicable successor provisions.

[1]The CBO is the CEC s duly appointed representative, who may be the City or County Chief Building Official, or other appointed representative.

CBC Lateral Force Requirements

The procedures and limitations for the seismic design of structures by the 1998 CBC are determined considering seismic zoning, site characteristics, occupancy, structural configuration, structural system and height. Different design and analysis procedures are recognized in the 1998 CBC for determining seismic effects on structures. The dynamic lateral force procedure of Section 1631 is always acceptable for design. The static lateral force procedure of Section 1630 is allowed under certain conditions of regularity, occupancy and height as determined under Section 1629. Nonbuilding structures (such as cooling towers, tanks and heat recovery steam generators) are included in Section 1634. Most of the structures in powerplant projects are considered nonbuilding structures.

Static Lateral Force Procedure

In seismic Zones 3 and 4, the static lateral force procedure of Section 1630 may be used for the following:

Regular structures under 240 feet in height with lateral force resistance provided by systems, listed in Table 16-N, except where Section 1629.8.4, Item 4, applies. (Structures, regular or irregular, located on Soil Profile Type S_F, that has a period of vibration greater than 0.7 second require dynamic analysis.)

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:

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.)

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.)

Structures, regular or irregular, located on Soil Profile Type S_F, that have a period greater than 0.7 seconds.

Rigid Structures Lateral Force Design

Rigid structures (those with a fundamental period of vibration less than 0.06 second) and their anchorage shall be designed using procedures consistent with the requirements of Section 1634.3 and any other applicable provisions of Section 1634.

TANKS WITH SUPPORTED BOTTOMS

Flat bottom tanks or other tanks with supported bottoms founded at or below grade shall be designed consistent with Section 1634.4 and any other applicable provisions of Section 1634.

OTHER NONBUILDING STRUCTURES

Nonbuilding structures not covered by Sections 1634.3 and 1634.4 shall be designed consistent with the requirements of Section 1634.5 and any other applicable provisions of Section 1634.

ENSURING THE APPROPRIATE LATERAL FORCE PROCEDURE

In order to ensure that structures are analyzed using the appropriate lateral force procedure, staff has included Proposed Condition of Certification **STRUC-1** below, which in part requires review and approval by the CBO of the project owner s proposed lateral force procedures prior to the start of construction.

CIVIL/STRUCTURAL FEATURES

The applicant plans to modernize the MLPPP. The modernization will include:
Demolition. Demolition of the existing, unused fuel oil storage tanks and related environmental cleanup.

Selective Catalytic Reduction (SCR) Installation. Addition of SCR to Units 6 and 7.
The Project. The replacement of Units 1 through 5 (613 MW) with two combined-cycle units for a combined capacity of 1,060 MW, and demolition of eight 225-foot tall stacks previously used in the operation of Units 1 through 5.

Balance of plant (BOP) required to incorporate the project into the existing plant operations include transmission tie-in from the new combined-cycle units to the adjacent Pacific Gas and Electric (PG&E) Moss Landing switchyard, two 145-foot tall stacks, and the installation of three natural gas compressors and associated gas line extensions from the adjacent PG&E gas meter and regulator yard. Cooling water will be supplied using the existing Units 1 through 5 seawater intake structure and discharged through the existing Units 6 and 7 outfall.

The applicant proposes, and staff concurs that small, lightly loaded structures, not subject to vibratory loading be supported on shallow footings or mat foundations on properly compacted fill or undisturbed native soils. Foundation depth should extend to at least 12 inches below lowest adjacent grade. If any portion of the foundation bears on bedrock, the entire foundation should be deepened to bear on bedrock. Large, heavily loaded structures, and structures subjected to vibratory loading, should be constructed on deepened foundations that bear on bedrock. Such foundations may include deepened footing or concrete reinforced pier and grade beams. The powerplant and related facilities shall be designed to meet the seismic requirements of the latest edition of the California Building Code.

MECHANICAL SYSTEMS

Each of the two new natural gas-fired combined-cycle units is expected to produce a nominal 530 MW of electrical output under average conditions. Each unit will include two natural gas-fired combustion turbine generators (CTGs), two unfired heat recovery steam generators (HRSGs), and a reheat, condensing steam turbine generator (STG) in a 2-on-1 configuration. Each unit will utilize seawater for once-through cooling. Associated equipment will include emission control technologies necessary to meet required air quality standards.

Each CTG will exhaust to a dedicated HRSG. Each HRSG is a horizontal, natural circulating type unit with three pressure levels of steam generation and a reheat loop. 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 (MLPPP 1999a, Appendix 8-5) 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 (MLPPP 1999a, Appendix 8-6). Almost all of the power produced by the project will be delivered to the plant s interconnection with PG&E.

<u>Power and Control Wiring</u>. In general, conductors will be insulated based on a normal maximum conductor temperature of 90…C in 40…C ambient air with a maximum emergency overload temperature of 130…C and a short circuit temperature of 250…C. In areas with higher ambient temperatures, larger conductors will be used or higher temperature rated insulation will be selected.

<u>Protective Relaying</u>. These relays protect equipment in the auxiliary power supply system, generator terminal systems, 230 kV system, 4.16 kV systems, turbine-

generator system, and the electrical loads powered from these systems. The protective relaying scheme will be designed to remove or alarm any of the abnormal occurrences.

Classification of Hazardous Areas. Areas where flammable and combustible liquids, gases, and dusts are handled and stored will be classified for determining the minimum criteria for design and installation of electrical equipment to minimize the possibility of ignition. The criteria for determining the appropriate classification are specified in Article 500 of the National Electrical Code s National Fire Protection Association/American National Standards Institute (NFPA/ANSI), Section C1.

Grounding. The station grounding system will be an interconnected network of bare copper conductors and copper clad ground rods. The system will be provided to protect plant personnel and equipment from hazard, which can occur during power system faults and lightning strikes. The station-grounding grid will be designed for adequate capacity to dissipate heat from ground current under the most severe conditions in areas of high ground fault current concentrations.

Site Lighting. The site lighting system will provide personnel with illumination for the performance of general yard tasks, safety, and plant security. Power used to supply outdoor roadway and area lighting will be 277 volts.

Freeze Protection. A freeze protection system will be provided for selected outdoor piping as required. Parallel circuit type heating cable will be utilized where possible.

Cathodic Protection System. Cathodic protection and other corrosion control measures for all plant structures, including the exterior surface of underground piping and bottoms of surface mounted steel tanks will be provided as required.

The AFC (MLPPP 1999a, Appendix 8-6) 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 (MLPPP 1999a, Appendix 8-6). Staff has proposed conditions of certification (**ELEC-1** and **ELEC-2**, below) to monitor this compliance.

ANCILLARY FACILITIES

The existing transmission, gas and water facilities can accommodate the additional load with only minor modifications. New pipelines and electrical transmission lines will not be required, except for short segments within the MLPPP to connect the

Project to the existing fuel supply and electrical transmission facilities. Additional intake or discharge structures for cooling water will not be required.

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.

PROJECT QUALITY PROCEDURES

The AFC (MLPPP 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:

Staff will meet with the local building department to discuss the Energy Commission s compliance process and the potential involvement of the local building official as delegate agent.

Staff will propose a memorandum of understanding (MOU) with Monterey 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.

Staff will meet with the County and its subcontractor (if applicable) to discuss the details of the design review and construction inspection process, fees, types of submittals required of the process and timing of the review.

Staff has developed conditions of certification (see the section below, titled "Proposed Conditions of Certification") to ensure compliance with LORS and protection of the environment and public health and safety. Some of these conditions address the roles, responsibilities and qualifications of MLPPP s engineers responsible for the design and construction of the project (proposed conditions of certification **GEN-1** through **GEN-8**). Engineers responsible for the design of the civil, structural, mechanical, and electrical portions of the project are required to be registered in California, and to sign and stamp each submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that no element of construction proceed without prior approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility with construction activities, these conditions are written to require that no element of construction of permanent facilities, which are difficult to reverse, may proceed without prior approval of plans from the CBO. For those elements of construction that are not difficult to reverse and are allowed to proceed without approval of the plans, the applicant shall have the responsibility to fully modify those elements of construction to comply with all design changes that result from the CBO s plan review and approval process.

FACILITY CLOSURE

A facility closure was evaluated under three scenarios; Planned Closure, Unexpected Temporary Closure and Unexpected Permanent Closure.

PLANNED CLOSURE

The removal of a facility from service, or decommissioning, as a result of the project reaching the end of its useful life, may range from mothballing to removal of all equipment and appurtenant facilities. Future conditions that may affect the decommissioning Decision are largely unknown at this time.

In order to assure that decommissioning of the facility will be completed in a manner that is environmentally sound, safe, and will protect public health and safety, the

applicant shall submit a decommissioning plan to the Energy Commission and Monterey County for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of the following items:

Proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;

All applicable LORS, local/regional plans, and a discussion of the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;

The activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and

Decommissioning alternatives, other than complete site restoration.

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 should be designed and built to the 1998 CBC (or successor standard, if such is in effect); and
3. The CBO shall review the final designs, conduct plan checking and perform field inspections during construction, and staff audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct and inspect the project in accordance with the 1998 California Building Code (CBC)[2] and all other applicable LORS in effect at the time initial design plans are submitted to the CBO for review and approval. The CBC in effect is that edition that has been adopted by the California Building Standards Commission and published at least 180 days previously.

Protocol: In the event that the MLPPP is submitted to the CBO when a successor to the 1998 CBC is in effect, the 1998 CBC provisions identified herein

[2] The Sections, Chapters, Appendices and Tables, unless otherwise stated, refer to the Sections, Chapters, Appendices and Tables of the 1998 California Building Code (CBC).

shall be replaced with the applicable successor provisions. *Where, in any specific case, different sections of the code specify different materials, methods of construction, or other requirements, the most restrictive shall govern.* Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

Verification: Within 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) after receipt of the Certificate of Occupancy, the project owner shall submit to the California Energy Commission Compliance Project Manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable LORS and the Energy Commission's Decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [1998 CBC, Section 109 — Certificate of Occupancy.]

GEN-2 The project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List, and a Master Specifications List. The schedule shall contain a description of, and a list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major structures and equipment in **Table 1: Major Equipment List** below). To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Table 1: Major Equipment List

Equipment/System	Quantity Plant	Size/ Capacity*	Remarks
Combustion Turbine Generator	4	172 MW each	DLN combustion control
Heat Recovery Steam Generator	4		Three pressure with reheat. No duct firing
Aqueous Ammonia Storage Tank	1	33,000 gal	For NO_x control
Ammonia Injection Blower	8		Two per HRSG
High Pressure/Intermediate Pressure (HP/IP) Boiler Feedwater pump	4	910/300 gpm	HP feed with interstage bleed
Desalination Evaporator	1	100 gpm	50% recovery vapor compression
Oily Water Separator	1	100 gpm	CPI separator package
Air Compressor	2	300 scfm	Service and instrument air
Steam Turbine Generator	2	196 MW	Reheat/Condensing
Steam Surface Condenser	2	1,160 MMBtu/hr	Sea water
Condensate Pump	4	3,100 gpm	Vertical turbine
Circulating Water Pump	6	42,000 gpm	
Fuel Gas Filter/Separator	1	330,000 lb./hr	For natural gas fuel
Demineralized Water Package	1	100 gpm	Two trains
Demineralized Water Pump	3	100 gpm	HRSG Makeup water & CT water wash
Demineralized Water Tank	1	500,000 gal	For cycle makeup water & CT water wash
Continuous Emission Monitoring System	4		
Blow Down Recovery Tank	2	50,000 gal	24 hours each

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

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

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

Verification: The project owner shall make the required payments to the CBO at the time of submittal of the plans, design calculations, specifications, or soil reports. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project [Building Standards Administrative Code (Cal. Code Regs., tit. 24,/4-209, Designation of Responsibilities).]

Protocol: The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

The RE shall:

1. Monitor construction progress to ensure compliance with LORS;

Protocol: Ensure that construction of all the facilities conforms in every material respect to the applicable LORS, these Conditions of Certification, approved plans, and specifications;

2. 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;
3. 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;
4. 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
5. 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.

Verification: If the RE or the delegated engineer(s) are subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of powerplant structures and equipment supports; D) a mechanical engineer; and E) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.]

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, powerplant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

Protocol: 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 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 Monterey 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 MLPPP 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 Monterey County and the CPM for review and approval. Prior to the submittal of the closure plan, a meeting shall be held between the project owner and the CPM for discussing the specific contents of the plan.

CIVIL-1 Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils report as required by the 1998 CBC, Appendix Chapter 33, Section 3309.5, Soils Engineering Report and Section 3309.6, Engineering Geology Report.

Verification: At least 15 days prior to the start of site grading, the project owner shall submit the documents described above to the CBO for review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area. [1998 CBC, Section 104.2.4, Stop orders.]

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

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

Protocol: If, in the course of inspection, it is discovered that the work is not being done in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action, and send copies to the CBO and the CPM.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a Non-Conformance Report (NCR), and the proposed corrective action. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following Monthly Compliance Report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage facilities, the project owner shall obtain the CBO's approval of the final "as-graded" grading plans, and final "as-built" plans for the erosion and sedimentation control facilities [1998 CBC, Section 109, Certificate of Occupancy.]

Verification: Within 30 days of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall submit to the CBO the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of this report to the CPM in the next Monthly Compliance Report.

STRUC-1 Prior to the start of any increment of construction, the project owner shall submit to the CBO for review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for:

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

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

Protocol: The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications [1998 CBC, Section 108.4, Approval Required];
3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures at least 90 days (or a lesser number of days mutually agreed to by the project owner and the CBO), prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation [1998 CBC, Section 106.4.2, Retention of plans and Section 106.3.2, Submittal documents.]; and
4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations and specifications shall be signed and stamped by the responsible design engineer [1998 CBC, Section 106.3.4, Architect or Engineer of Record.]

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of construction, the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

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

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

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

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);
2. Concrete pour sign-off sheets;

3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and
5. Reports covering other structure activities requiring special inspections shall be in accordance with the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section 1701.5, Type of Work (requiring special inspection), Section 1702, Structural Observation and Section 1703, Nondestructive Testing.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the condition(s) of certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 1998 CBC, Chapter 1, Section 106.3.2, Submittal documents, and Section 106.3.3, Information on plans and specifications, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give the CBO prior notice of the intended filing.

Verification: On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the Monthly Compliance Report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in Chapter 3, Table 3-E of the 1998 CBC shall, at a minimum, be designed to comply with Occupancy Category 2 of the 1998 CBC. Chapter 16, Table 16—K of the 1998 CBC requires use of the following seismic design criteria: I˚=˚1.25, I_p = 1.5 and I_w = 1.15.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of installation of the tanks or vessels containing the above specified quantities of highly toxic or explosive substances that would be hazardous to the safety of the general public if released, the project owner shall submit to the CBO for review and approval, final design

plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

Verification: The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-1 Prior to the start of any increment of piping construction, the project owner shall submit, for CBO review and approval, the proposed final design drawings, specifications and calculations for each plant piping system (exclude domestic water, refrigeration systems, and small bore piping, i.e., piping and tubing with a diameter less than two and one-half inches). The submittal shall also include the applicable QA/QC procedures. The project owner shall design and install all piping, other than domestic water, refrigeration, and small bore piping to the applicable edition of the CBC. Upon completion of construction of any piping system, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 106.3.2, Submittal documents, Section 108.3, Inspection Requests.]

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

1. The proposed final design plans, specifications and calculations conform with all of the piping requirements set forth in the Energy Commission s Decision; and
2. All of the other piping systems, except domestic water, refrigeration systems and small bore piping have been designed, fabricated and installed in accordance with all applicable ordinances, regulations, laws and industry standards, including, as applicable:

   - American National Standards Institute (ANSI) B31.1 (Power Piping Code);
   - ANSI B31.2 (Fuel Gas Piping Code);
   - ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
   - ANSI B31.8 (Gas Transmission and Distribution Piping Code); and
   - Specific City/County code.

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

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of piping construction, the project owner shall submit to the CBO for approval, with a copy of the transmittal letter to the CPM, the above listed documents for that increment of construction of piping systems, including a copy of the signed and stamped engineer's certification of conformance with the Energy Commission s Decision.

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

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation [1998˚CBC, Section 108.3 — Inspection Requests.]

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and
2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for review and approval, final design plans, specifications and calculations, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

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

MECH-3 Prior to the start of construction of any heating, ventilating, air conditioning (HVAC) or refrigeration system, the project owner shall submit to the CBO for review and approval the design plans, specifications, calculations and quality control procedures for that system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

Protocol: The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the applicable edition of the CBC. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and

calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS [1998 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record.]

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, with a copy of the transmittal letter to the CPM.

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

MECH-4 Prior to the start of each increment of plumbing construction, the project owner shall submit for CBO's approval the final design plans, specifications, calculations, and QA/QC procedures for all plumbing systems, potable water systems, drainage systems (including sanitary drain and waste), toilet rooms, building energy conservation systems, and temperature control and ventilation systems, including water and sewer connection permits issued by the local agency. Upon completion of any increment of construction, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 108.3, Inspection Requests, Section 108.4, Approval Required.]

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

1. Plumbing, potable water, all drainage systems, and toilet rooms in accordance with Title 24, California Code of Regulations, Division 5, Part 5 and the California Plumbing Code (or other relevant section(s) of the currently adopted California Plumbing Code and Title 24, California Code of Regulations); and
2. Building energy conservation systems and temperature control and ventilation systems in accordance with Title 24, California Code of Regulations, Division 5, Chapter 2-53, Part 2.

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

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any of the above

systems, the project owner shall submit to the CBO the final design plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the next Monthly Compliance Report following completion of that increment of construction.

ELEC-1 For the 480 volts and higher systems, the project owner shall not begin any increment of electrical construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [1998 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests.]

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

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

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for electrical equipment and systems 480 volts and greater, including a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

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

Protocol: A. Final plant design plans to include:

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

Protocol: B. Final plant calculations to establish:

1. short-circuit ratings of plant equipment;
2. ampacity of feeder cables;

3. voltage drop in feeder cables;
4. system grounding requirements;
5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
6. system grounding requirements;
7. lighting energy calculations; and
8. other reasonable calculations as customarily required by the CBO.

Protocol: C. A signed statement by the registered electrical engineer certifying that the 1.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

Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.

Duke Energy. 1999c. Data Adequacy Supplemental filing, dated July 30, 1999.

Duke Energy. 1999d. First set of Data Responses 1-24, dated October 4, 1999.

Duke Energy. 1999h. Letter describing changes to Moss Landing Power Plant Project —i.e., upgrade change to existing Units 6 & 7, submitted to the California Energy Commission on September 7, 1999.

Duke Energy. 1999i. Duke Energy supplemental to the AFC detailing upgrade changes to Units 6 & 7. Submitted to the Energy Commission on November 22, 1999.

POWER PLANT RELIABILITY

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 Duke Energy Moss Landing LLC (Duke Energy, the applicant) has predicted a level of reliability for the power plant (see below), staff believes the applicant should not be held responsible for achieving this goal, so long as the plant s reliability matches or exceeds that of similar plants.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Presently, there are no laws, ordinances, regulations or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the commission must make findings as to the manner in which the project is to be designed, sited and operated to ensure safe and reliable operation (Cal. Code Regs., tit. 20,／1752(c)). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if the project exhibits reliability at least equal to that of other power plants on that system.

SETTING

In the regulated monopoly electric industry of past decades, the utility companies assured overall system reliability, in part, by maintaining a reserve margin. This amounted to having on call, at all times, sufficient generating capacity, in the form of standby power plants, to quickly handle unexpected outages of generating or transmission facilities. The utilities generally maintained a seven- to ten-percent reserve margin, meaning that sufficient capacity was on call to quickly replace from seven to ten percent of total system resources. This margin proved adequate, in part because of the reliability of the power plants that constituted the system.

Now, in the newly restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the California Independent System Operator (Cal-ISO), a newly-formed entity that will work with the California Power Exchange (PX) to purchase, dispatch and sell electric power throughout the state. How Cal-ISO will ensure system reliability is only now being determined; protocols are being developed and put in place that will, it is anticipated, allow sufficient reliability to be maintained under the competitive market system. Must-run power purchase agreements and participating generator agreements are two mechanisms being 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 are accustomed.

Duke Energy proposes to operate the 1,060 MW combined cycle portion of the project at baseload, selling energy on the market. In addition, the applicant proposes to provide local power system support by selling ancillary services, including peaking, turndown, voltage support and reactive power support. This portion of the project is expected to operate at an overall availability of 92 to 96 percent, at a capacity factor determined by market demand and projected to lie between 50 and 90 percent (Duke Energy 1999a, AFC// 1.1, 1.2, 2.3.3.1, 2.3.3.5, 8.3.1, 8.5.2.2.1).

In addition, the applicant proposes to upgrade the existing Moss Landing Units 6 and 7, two 750 MW steam boiler units built in the mid-1960s. Concurrently with the installation of air emissions control hardware, the steam turbine rotors of these units will be replaced with upgraded rotors, increasing power output from each unit by 15˚MW. The refurbished Units 6 and 7 are projected to operate at a capacity factor

of 40 percent (Duke Energy 1999a, AFC⁄⁄1.1, 1.4.3, 2.0, 2.1.1, 2.2.2, 2.3.3.1, 2.3.3.3, 8.1, 8.3.2, 8.5.2.2.2; Duke Energy 1999h).

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 MLPPP and compares them to industry norms. If they compare favorably, staff can conclude that the MLPPP will not degrade utility system reliability.

Throughout its intended life, the project will be expected to perform reliably in baseload, load following and peaking 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).

The QA/QC program delineated by the applicant (Duke Energy 1999a, AFC ⁄⁄8.5.2.1, 8.5.2.2.3, 8.5.2.2.4) describes a program typical of the power industry. Equipment and supplies will be purchased from qualified suppliers of proven capabilities in accordance with the QA plan. 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 appropriate redundancy of function for the combined cycle portion of the project (Duke Energy 1999a, AFC⁄8.5.2.2.3). Although no specific list of redundant equipment appears in the application, Duke Energy s reputation as one of the nation s preeminent electric utilities lends confidence that

the MLPPP will be designed with an adequate level of equipment redundancy. Additionally, the fact that the project consists of four parallel trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other trains to fail, thus allowing the plant to continue to generate (at reduced output). With this opportunity for continued operation in the face of equipment failure, staff believes that equipment redundancy will be sufficient for a project such as this.

The applicant proposes no additional redundant equipment for the upgraded Units 6 and 7 (Duke Energy 1999a, AFC⁄8.5.2.2.3). In light of the extensive experience that the plant s owners have had with these units, staff rates current reliability as adequate, and fully expects that it will be maintained in the future.

MAINTENANCE PROGRAM

The applicant proposes to establish a plant maintenance program typical of the industry (Duke Energy 1999a, AFC⁄⁄2.3.3.5, 8.5.2.1, 8.5.2.2.4). The program will encompass preventive and predictive maintenance techniques, employing both plant maintenance staff and contractors. Maintenance outages will be planned for periods of low electricity demand. In conjunction with an overall plant quality control program (Duke Energy 1999a, AFC⁄8.5.2.2.4), staff expects that this will ensure that the project will be adequately maintained to ensure acceptable reliability.

FUEL AND WATER AVAILABILITY

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

The MLPPP will burn natural gas from the existing PG&E interstate pipeline system, transmitted to the plant via two existing 20-inch and 24-inch diameter pipelines (Duke Energy 1999a, AFC⁄⁄1.4.4, 2.3.3.11, 8.5.1.1). The PG&E natural gas system, which provides access to gas from the Southwest, the Rocky Mountains and Canada, represents a resource of considerable capacity. This system offers access to far more gas than the plant would require (Duke Energy 1999a, AFC ⁄8.5.1.1). Staff agrees with the applicant s prediction that there will be adequate natural gas supply and pipeline capacity to meet the project s needs.

The MLPPP will use seawater for cooling the steam turbines condensers, and desalinated seawater for all power cycle makeup uses, including evaporative inlet air cooling makeup. Fire water and domestic water for normal and sanitary plumbing system use will be obtained from existing groundwater wells at the project site. Bottled water will be provided to satisfy drinking water needs (Duke Energy 1999a, AFC⁄⁄1.1, 1.4.5, 2.1.1.7, 2.3.3.6, 8.3.1.1, 8.3.1.2, 8.5.2.2.5). Staff regards this arrangement as an adequately reliable supply.

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, flooding,[1] 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 those portions of this document entitled **Facility Design** and **Geology**).

The site lies within Seismic Zone 4 (Duke Energy 1999a, AFC/ 1.5.12, 2.3.3.10). No active earthquake faults lie nearby. The project will be designed and constructed to the latest appropriate LORS. Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking, compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded (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 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 92 to 96 percent (Duke Energy 1999a, AFC/ 2.3.3.5) 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 four parallel gas turbine generating trains, maintenance can be scheduled during those times of year when the full plant output is not required to meet market demand, typical of industry standard maintenance procedures (Duke Energy 1999a, AFC/ 8.5.2.1). 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.

[1] The project site lies outside any 100-year flood plains (Duke Energy 1999a, AFC/ 2.3.2).

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 92 to 96 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 the plant will be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability.

REFERENCES

Detmers, Jim. 1999. Director of Maintenance and Reliability, California Independent System Operator. Interview with Steve Baker (California Energy Commission), July 13, 1999.

Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.

Duke Energy. 1999h. Letter describing changes to Moss Landing Power Plant Project, i.e., upgrade change to existing Units 6 & 7, submitted to the California Energy Commission on September 7, 1999.

Mavis, Steve. 1998. Transmission Planner, California Independent System Operator. Telephone conversation with Steve Baker (California Energy Commission), January 23, 1998.

McGraw-Hill (McGraw-Hill Energy Information Services Group). 1994. *Operational Experience in Competitive Electric Generation, an Executive Report*, 1994.

NERC (North American Electric Reliability Council). 1998. 1993-1997 Generating Availability Report.

POWER PLANT EFFICIENCY

Steve Baker

INTRODUCTION

The Energy Commission makes findings as to whether energy use by the Moss Landing Power Plant Project (MLPPP) 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 MLPPP 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

Duke Energy Moss Landing LLC (Duke Energy, the applicant) proposes to construct and operate a (nominal) 1,060 MW combined cycle power plant to generate baseload power and provide local power system support (peaking, turndown, voltage support, reactive power support). The combined cycle portion of the MLPPP will consist of four General Electric PG7241 F-class combustion turbine generators with evaporative inlet air coolers producing approximately 170 MW each, four heat recovery steam generators (HRSGs) and two 190˚MW reheat steam turbine generators, totaling approximately 1,060 MW (Duke Energy 1999a, AFC ⁄⁄ 2.3.3.2, 8.3.1, Fig. 8.3, Fig. 8.4, Appendix 8-1).

Further, Duke Energy will upgrade two existing 750 MW supercritical steam boiler units, Moss Landing Units 6 and 7. These units, built in the mid-1960s, must be retrofitted with selective catalytic reduction (SCR) systems for control of air emissions; installation of SCR involves replacement of the forced draft fans on the boilers, as well as the installation of induced draft fans. Duke Energy will use this opportunity to concurrently replace the Units 6 and 7 steam turbine rotors with new, upgraded rotors that will yield an additional 15 MW output per unit (Duke Energy 1999a, AFC⁄⁄ 1.1, 1.2, 1.4.3, 2.1.1, 2.1.2, 2.2.2, 2.3.3, 2.3.3.5, 8.3.1, 8.6.1, 8.6.2, Appendix 8-1; Duke Energy 1999h).

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;
- 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 MLPPP will burn natural gas at a maximum rate exceeding 142 billion Btu per day LHV[1] (Duke Energy 1999a, AFC ⁄ 8.6.1). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies.

Under expected project conditions, electricity will be generated by the combined cycle plant at a peak load efficiency of approximately 55.6 percent LHV. The upgraded Units 6 and 7 will generate electricity at an annual average (assuming a 40 percent capacity factor in load-following and peaking duty) of 43.5 percent LHV (Duke Energy 1999a, AFC⁄ 8.6.1). Compare these figures to the average fuel

[1] Lower heating value.

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 MLPPP (Duke Energy 1999a, AFC// 1.4.4, 2.3.3.11, 8.5.1.1). The project will burn natural gas from the Pacific Gas & Electric (PG&E) interstate pipeline system, which draws gas from the Southwest, the Rocky Mountains, and Canada. These sources represent far more gas than would be required for a project this size. It is highly unlikely that the MLPPP 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 two existing 20-inch and 24-inch diameter pipelines from the PG&E regulator station in Hollister, approximately 25 miles to the east (Duke Energy 1999a, AFC// 1.4.4, 2.3.3.11). The natural gas supply system in California is so large and well-established, there is no real likelihood that the MLPPP will require development of new sources of energy.

COMPLIANCE WITH ENERGY STANDARDS

No standards apply to the efficiency of the MLPPP or other non-cogeneration projects.

ALTERNATIVES TO REDUCE WASTEFUL, INEFFICIENT AND UNNECESSARY ENERGY CONSUMPTION

The MLPPP 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 MLPPP will be configured as a double compound-train combined cycle power plant, in which electricity is generated by four gas turbines, and additionally by two reheat steam turbines that operate 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 or more gas turbines. This allows the plant to generate at less than full load while maintaining optimum efficiency, suitable for a plant meant for flexible generation, such as peaking and load-following duty. Loads down to 25 percent of full load allow one gas turbine, operating at full load, and its steam turbine to maintain peak efficiency.

EQUIPMENT SELECTION

Modern gas turbines embody the most fuel-efficient electric generating technology available today. The F-class gas turbines to be employed in the MLPPP represent some of the most modern and efficient such machines now available. The applicant will employ combined cycle power trains from a prominent manufacturer: the General Electric PG7241, an F-class gas turbine nominally rated in a two-on-one train combined cycle at 530 MW and 56.5 percent efficiency LHV at ISO[2] conditions (Duke Energy 1999a, AFC// 1.1, 1.4.2, 2.2.1, 8.3.1; GTW 1998).

One possible alternative to the General Electric machine selected is the Siemens-Westinghouse 501F, an F-class machine nominally rated in a two-on-one train combined cycle configuration at 546 MW and 55.8 percent efficiency LHV at ISO conditions (GTW 1998). Another 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 and peaking electricity and ancillary services, as market conditions dictate; and improving local system reliability while reducing system losses (Duke Energy 1999a, AFC// 1.2, 1.2.2, 2.1.1, 2.3.3.5, 8.3.1, 8.5.2.2.1).

Alternative Generating Technologies

The applicant addresses alternative generating technologies in its application (Duke Energy 1999a, AFC// 5.5, 5.6). Oil-burning, coal-burning, solar, wind, hydroelectric, biomass, municipal solid waste, fuel cells, ocean energy, nuclear 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 for the MLPPP.

---

[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).

Natural Gas-Burning Technologies

Fuel consumption is one of the most important economic factors in selecting an electric generator; fuel typically accounts for over two-thirds of the total operating costs of a fossil-fired power plant (Power 1994). Under a competitive power market system, where operating costs are critical in determining the competitiveness and profitability of a power plant, the plant owner is thus strongly motivated to purchase fuel efficient machinery.

Capital cost is also important in selecting generating machinery. Recent progress in the development of large, stationary gas turbines, aided by the incorporation into these machines of technological advances made in the development of aircraft jet engines, has created a situation in which several large manufacturers compete vigorously to sell their machines. This, combined with the cost advantages of assembly-line manufacturing, has driven down the prices of these machines. Thus, the power plant developer can purchase a turbine generator that not only offers the best available fuel efficiency, but at the same time sells for the lowest per-kilowatt capital cost.

The applicant addresses alternative gas-fired generating technologies in the application (Duke Energy 1999a, AFC⁄⁄5.5, 5.6). Rankine cycle (steam boiler), Kalina cycle, steam-injected gas turbine, intercooled gas turbine, chemically recuperated gas turbine, and humid air gas turbine cycles are all considered and rejected for reasons of either fuel efficiency, economics or commercial availability.

One possible alternative to an F-class gas turbine is the Siemens-Westinghouse 501G gas turbine generator, a G-class machine that employs partial steam cooling to allow slightly higher temperatures, yielding greater efficiency. The 501G is rated at 58˚percent efficiency, 1.5 percent higher than the General Electric Frame 7F, and produces 367˚MW to the 7F s 530 MW; a three-train G-class power plant would produce a nominal 1,100 MW. However, 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 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 (Duke Energy 1999a, AFC⁄⁄1.4.5, 2.3.3.2). Staff deems this a reasonable 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 MLPPP.

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 MLPPP, if constructed and operated as proposed, would generate 1,060 MW of electric power at an overall project fuel efficiency of approximately 56 percent, and add 30 MW of capacity to the existing Moss Landing Units 6 and 7 at an efficiency of approximately 44 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 MLPPP 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 MLPPP. No Conditions of Certification are proposed.

REFERENCES

Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.

Duke Energy. 1999h. Letter describing changes to MLPPPP i.e., upgrade change to -----units 6 & 7, submitted to the CEC on September 7, 1999.

GTW (Gas Turbine World). 1998. *Gas Turbine World 1998-1999 Performance Specs*, volume 18. December 1998.

Orsini, S. 1999. Applications Engineer, ABB Power Generation Systems, Inc. Telephone conversation with Steve Baker (California Energy Commission), February 18, 1999.

Power (Power Magazine). 1994. Operating and maintaining IPP/cogen facilities, *Power*, September 1994, p. 14.

Power (Power Magazine). 1999. Huge and tiny turbine projects move forward, *Power*, September/October 1999, p. 5.

TRANSMISSION SYSTEM ENGINEERING

Charles Vartanian and Al McCuen

INTRODUCTION

The Transmission System Engineering (TSE) analysis provides the basis for the findings in the Energy Commission s decision. This preliminary staff assessment indicates whether or not the transmission facilities associated with the proposed project conform to all applicable laws, ordinances, regulations and standards (LORS) required for safe and reliable electric power transmission.

The Duke Energy Moss Landing LLC proposes to connect their project, the Moss Landing Power Plant Project (MLPPP), 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 the power plant switchyard, outlet line, termination facilities and outlet alternatives identified by the applicant and provides proposed conditions of certification to ensure that the project complies with applicable LORS during the design, construction, operation and potential closure of the project.

Public Resources Code, section 25523 requires the Energy Commission to prepare a written decision which includes: findings regarding conformity of the proposed site and related facilities with public safety standards and with other relevant local, regional, state, and federal standards, ordinances, and laws. Under the California Environmental Quality Act (CEQA) the Energy Commission must conduct an environmental review of the whole of the action, which may include facilities not licensed by the Energy Commission (CCR, tit. 14, and/15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities beyond the project s interconnection with the existing transmission system that are required as a result of the power plant addition to the California transmission system.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

California Public Utilities Commission (CPUC) General Order 95 (GO-95), Rules for Overhead Electric Line Construction , formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance, operation or use of overhead electric lines and to the public in general.

CPUC Rule 21 provides standards for the reliable connection of parallel generating stations connected to participating transmission owners.

Western Systems Coordinating Council (WSCC) Reliability Criteria provides the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria includes the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 Criteria for Transmission System Contingency Performance which requires that the results of power flow and stability simulations verify established performance levels.

Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or facility loading outside emergency limits) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas. While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).

North American Electric Reliability Council (NERC) Planning Standards provides policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC s Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions, however the NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).

Cal-ISO Reliability Criteria also provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC s Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid.

Cal-ISO Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria. These standards will be applied to the assessment of the system reliability implications of the MLPPP. Also of major importance to the MLPPP, and other privately funded projects which may sell through the California Power Exchange (Cal-PX) are the Cal-ISO Day/Hour Ahead Inter-zonal Congestion Management Scheduling Protocol

(SP 10), the Transmission System Loss Management Scheduling Protocol (SP 4), and the Creation of the Real Time Merit Order Stack (SP 11). The Congestion Management Scheduling Protocol provides that the operation of power plants not violate system criteria when market participants request generation dispatch or the use of major interties. The Real Time Merit Order Stack is developed based on increasing energy bid prices so that the least cost bids are accepted early on and if congestion is anticipated the highest bids are not selected. The Transmission System Loss Management Scheduling Protocol uses the Cal-ISO power flow model to identify total transmission losses at each generating unit and scheduling point. Additional calculations are performed the generating units net power output to meet their scheduled obligations (Cal-ISO 1998a, Cal-ISO 1998b).

Cal-ISO Participating Generator Agreement consists of detailed explanations of the requirements in the Cal-ISO Tariff pertaining to the paralleled generating unit.

PROJECT DESCRIPTION

Duke Energy (i.e., the applicant) is seeking to increase capacity at MLPPP by 1090 MW (1060 MW from the two 530 MW high efficiency combined cycle units replacing retired Units 1 — 5 (Duke Energy 1999a, AFC pages 1-2) and 30 MW from Units 6 — 7 (Duke Energy 1999i). The MLPPP facility is located 12 miles northwest of Salinas CA, in Monterey County at the intersection of Highway 1 and Dolan Road east of the Moss Landing Community and near the Moss Landing Harbor. The 239 acre MLPPP site is an industrial complex consisting of 7 generating units, 10 exhaust stacks, 19 fuel oil storage tanks, 2 seawater inlet and outlet structures, various warehouse and office buildings directly adjacent to PG&E s Moss Landing Switchyard (MLSY). The MLSY includes 115-kilovolt (kV), 230 kV, and 500 kV systems. Each of these systems, in turn, contains transmission lines, towers, switches, bus bars, and transformers.

The applicant proposes to replace the existing MLPPP Units 1 through 5 with two 530 MW (totaling 1060 MW) high efficiency combined cycle units, install four 145 foot tall exhaust stacks, and remove the eight 225-foot-tall existing exhaust stacks. Full-scale operation is currently scheduled to commence in October 2002. Moreover, the applicant proposes to upgrade existing MLPPP Units 6 and 7 by replacing the high-pressure rotor and increasing steam flow rate, resulting in an additional 15 MW per unit of generation capacity (totaling 30 MW). Unit 6 is currently scheduled to be operational in June 2003. Unit 7 is currently scheduled to be fully operational in December 2001.

The Cal-ISO has reviewed the Preliminary Facilities Study (PFS) for MLPPP. Cal-ISO s comments were transmitted in letter (dated 11.3.99 and docketed on 11.22.99) and included the following information regarding the PG&E PFS for MLPPP (Cal ISO 1999a, pages 1 — 5).

It is the Cal-ISO s opinion that (Cal-ISO 1999a, page 1):

1. Some additional information (see directly below) is needed before the Cal-ISO can determine all of the facilities that will be impacted by the MLPPP and to determine which of those facilities will need to be reinforced to reliably interconnect to the ISO Control Grid;
2. Once approved by the FERC, the ISO s New Generator Interconnection Policy (NGIP) may be utilized for generators already in the process of interconnecting to the ISO Control Grid. However, until that time Cal-ISO will utilize PG&E s PTO policy and practices for MLPPP; and
3. Additional information (see directly below) will be needed for MLPPP to receive preliminary interconnection approval; and,
4. Additional studies (see below after the additional information section) will need to be completed before the ISO can grant final interconnection approval.

The Cal-ISO requires additional information from the applicant prior to granting preliminary interconnection approval for the MLPPP, as follows (Cal-ISO 1999a, page 3):

PG&E needs to verify the short circuit impacts on circuit breaker (CB) #152 after the addition of new generation at MLPPP. CB #152 is normally open but can be closed under line outage or maintenance situations to serve the load at Dolan Road. PG&E staff is currently investigating this issue.

In order to accurately determine all the potential reliability and congestion impacts from MLPPP, the 2002 off-peak analysis should be re-run with generation at MLPPP s Units 6 and 7 at maximum as opposed to less than maximum as was done in the PFS. To compensate for the increase in MLPPP generation, the generation level at either Pittsburg and/or Contra Costa should be reduced to levels consistent with those used in the DFS for the Metcalf Energy Center. This sensitivity should provide a reasonably stressed South Bay Transmission system sufficient to determine any impacts to the ISO controlled grid resulting from the addition of the MLPPP.

Items 1. and 2. Are necessary to identify the facilities required for the project interconnection and the Cal-ISO to grant preliminary interconnection approval. Staff anticipates this information will be provided in early January and will form the basis for Staff s and the Cal-ISO s testimony in the Commission s hearings.

Additionally, the Cal-ISO requests that the following assumptions be made when developing the base cases to be used in the Detailed Facilities Study (DFS) (which will be used by the ISO to grant final Interconnection Approval).

The summer peak load level in the 2002 base case should be run with a base case MW value that more accurately reflects the 2002 projected load levels for the Bay Area.
Given that the conversion of the Watsonville substation from 60 kV to 115 kV has either been deferred or cancelled, the base case modeling for this area should reflect the most currently planned transmission configuration.

Furthermore, the Cal-ISO requests that the applicant provide the following additional analysis and information in the DFS so the ISO will have sufficient information to be able to grant final interconnection approval for MLPPP (Cal-ISO 1999a, page 4).

1. Include powerflow plots of the various base cases studied.
2. Run post transient and stability cases for all 500kV single line outages and common corridor double line outages.
3. Provide the following plots for each stability case in the DFS:

   _Line flow in MW or amperes for the lines that are being switched out and any lines in parallel with them for contingencies that involve line switching;
   _Plots of internal generator variables such as exciter field voltage, PSS output, and governor output for all Moss Landing generators;
   _Plots of Paul Sweet Statcom output;
   _Plots of the buses with the worst voltage deviations and frequency deviations for each case.

4. Perform a sensitivity analysis with the Enron (Calpine) (Pittsburg District Energy Facility) PDEF and Calpine/Bechtel Delta Energy Center (DEC) projects to verify adequate system performance with these proposed generators on-line.
5. Include a complete list of the outages run (either as an Autocon input file or some other acceptable format) as an appendix to the DFS. (This will allow the Reviewer to verify that a specific outage has been run).
6. Document the stability data used for the MLPPP include information on the machine, excitation system, Power System Stabilizers (PSS), and governor-turbine models.
7. Study the following additional powerflow outages in PG&E s De Anza, San Jose and Central Coast Divisions:

   Double Circuit Tower Line Outages; and,
   Bus Section Outages.

8. Determine the feasibility of implementing operating procedures to mitigate any overloads or criteria violations for the multiple element outages identified in 7 above;
9. Conduct additional transient stability studies to determine if the addition of the MLPPP generation would result in any adverse impact to the stable operation of the ISO Control Grid. These transient stability simulations should be run to twenty seconds, but could be terminated after only 10 seconds for obviously damped simulations. The additional stability cases should include:

   _Load Rejection (i.e., loss of 750 MW and 1500 MW of MLPPP generation);
   _a Single-Line-to-Ground Fault with delayed clearing (stuck breaker) on each 115 kV bus section, each 230 kV bus, and on the 500 kV ring bus at MLPPP; and,

_A Three-Phase-Fault on each 115 kV bus section, each 230 kV bus, and on the 500 kV ring bus at MLPPP.

The additional information and analysis items 1 through 9 are not required for the Cal-ISO to grant preliminary approval. This information may be provided later in the process after the Commission s hearings or even in the Compliance process. Condition of certification **TSE-1e** will provide that the Commission has an opportunity to review and approve the studies to assure conformance with reliability criteria.

PG&E S SWITCHYARD FOR MLPPP (MLSY)

The MLSY is located north of the main power plant structure. The Switchyard consists of three different sections, including 115 kV, 230 kV and 500 kV buses. The power produced by MLPPP Units 6 and 7 is connected to the MLSY s 500 kV system by existing short generation tie connections and step up transformers. From that point, power is directed to offsite substations (see the Existing Facilities and Related Systems Section for the specific details). The output from both 530-MW units will feed directly into the MLSY s 230 kV system (Duke Energy 1999a, AFC pages 8 -12).

TRANSMISSION LINE CHARACTERISTICS

The applicant has not yet determined MLPPP transmission conductor size. However, it will be sized to accommodate the full output from both 530 MW units in accordance with the conditions of certification specified in **TSE 1d**.

ALTERNATIVE TRANSMISSION LINE ROUTES

The MLPPP does not require any additional transmission line construction, except for short onsite segments necessary to convey power to the PG&E switchyards immediately adjacent to the MLPPP site (Duke Energy 1999a, AFC page 2-27). While the existing switchyards and power grid are adequately sized to be candidate facilities for interconnection, the MLPPP PFS does identify some switching station component replacement, and possible reconductoring or remedial action schemes, as required to accommodate the increased Project output. The MLPPP DFS will further develop the specific scope of facility upgrades required.

EXISTING FACILITIES AND RELATED SYSTEMS

The following electric facilities are located near the MLPPP site and transmission line routes. The MLSY is situated north of the main power plant structure and connected to several long-range transmission lines that extend offsite to various regional substations. The transmission lines are typically supported by 100- to 150-foot towers. At the receiving substations, the power is transformed (i.e., stepped down) to lower voltages (60 kV and less) for distribution to various communities and businesses. The transmission lines (Duke Energy 1999a, AFC pages 6.18-2 & 6.18-3) that exit MLSY include:

_Moss Landing-Los Banos 500-kV Line: This line serves the Los Banos substation, which is connected to the major 500 kV system and also serves San Joaquin

Valley areas. The Los Banos substation is located in Merced County, about 9 miles west of the City of Los Banos, and about 51 miles southeast of MLPPP;

_Moss Landing-Metcalf 500-kV Line: This line serves the Metcalf substation, which serves the greater San Jose and Santa Clara valley areas. The Metcalf substation is located in Santa Clara County, near the town of Coyote, approximately 35 miles northeast of MLPPP;

_Metcalf-Moss Landing 230-kV Lines 1 and 2: These lines also serve the Metcalf substation;

_Moss Landing-Panoche 230-kV Lines 1 and 2: These lines serve the Panoche substation, which serves the greater San Joaquin Valley areas. One line is looped through the Coburn substation, near King City in the Salinas Valley. The Panoche substation is located in Fresno County, about 70 miles east of MLPPP;

_Moss Landing-Green Valley 115-kV Lines 1 and 2: These lines serve the Green Valley substation, which serves the greater Santa Cruz area. The Green Valley substation is located in Santa Cruz County, about 14 miles north of MLPPP;

_Moss Landing-Del Monte 115-kV Lines 1 and 2: These lines serve the Del Monte (and Castroville) substations, which serve the greater Monterey area. The Del Monte substation is located in Monterey County, about 24 miles south of MLPPP;

_Moss Landing-Salinas 115-kV Lines 1 and 2: These lines serve the Salinas (and Dolan Road) substations, which serve the greater Salinas area. The Salinas substation is located in Monterey County, in the City of Salinas, about 20 miles east of MLPPP;

_Moss Landing 115-kV Taps 1 and 2: These taps serve the greater Salinas (and area, via the Hollister, Prunedale, Salinas, and Soledad substations.

SYSTEM RELIABILITY

INTRODUCTION

A system reliability study is performed to determine the affects of connecting a new power plant to the existing electric grid. The study should not only identify impacts but also ways negative impacts can be minimized or negated. Any new transmission facilities such as the power plant substation, the outlet line, and, or downstream facilities, required for connection to the grid are considered part of the project and are subject to the full AFC review process. The Cal-ISO has reviewed the PFS for the MLPPP. Based upon its review, the Cal-ISO stated that with the exception of the additional information requested in Attachment A, the ISO believes that the MLPPP PFS is adequate to determine the facilities that will need to be reinforced in order for the MLPP Expansion Project to reliably interconnect to the ISO Controlled Grid. Once the ISO has had the opportunity to review this additional information, the ISO should be able to quickly make a decision regarding preliminary interconnection approval. Moreover, the Cal-ISO stated that before it

can give its final approval for the MLPPP the applicant will need to complete some additional studies (Cal-ISO 1999a, page 1).

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 single 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, it is not clear whether the FERC will accept the Cal-ISO s Tariff as originally filed or they will order a revision of the Tariff filing 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; or 6) choosing another location. Staff expects the project owner and PG&E to develop RAS, if necessary, to mitigate any congestion caused by the MLPPP.

The creation of suitable RAS or another non-transmission reinforcement congestion mitigation option will be included as a condition of certification for the project. The Cal-ISO will provide testimony on the PFS and will provide conclusions and findings in the Energy Commission s hearings. At this time staff does not expect the project will require any downstream facilities. Completion of the DFS and the subsequent issuance of the Cal-ISO s conclusions and findings regarding the study will assure conformance with NERC, WSCC and Cal-ISO reliability criteria.

A condition of certification **TSE-1e** is recommended to provide for Energy Commission review of the DFS and the PG&E/applicant facility interconnection Agreement.

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 are 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 PFS is conducted in advance of potential system changes, such as the addition of the MLPPP 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 applicant requested that PG&E perform a PFS for its proposed MLPPP in April 1999. The purpose of this PFS was to evaluate system reliability regarding whether the addition of the MLPPP expansion with a total maximum generation of 2,726 MW at 0.85 PF (3207 MVA) would cause thermal overloads, voltage violations and/or electric system instability. Further, it would verify the sufficiency of reactive power. The scope of this PFS included: a) an evaluation of the impact to the PG&E transmission system with the addition of the MLPPP; and b) an identification of the transmission upgrades and their associated costs to mitigate the overloaded facilities caused solely as a result of the addition of the MLPPP (Duke Energy. 1999a, AFC Appendix 6.18.2, page 1).

I. The PFS s Assumptions and Estimated Work Scope include the following:

1. PFS s Interconnection Assumptions (5) [Duke Energy. 1999a, AFC Appendix 6.18.2, page 3]:

_The two generating MLPPP modules will have a maximum combined delivery of 1080 MW at 0.85 PF (1270 MVA) to the PG&E transmission grid;
_The two generating MLPPP modules will be connected to the 230kV bus utilizing existing oil circuit breaker numbers 370 and 380 with rated continuous current of 2 kA and interrupting current of 63 kA. The applicant owns these breakers but they re located in PG&E s MLSY;
_Both combined cycle generation modules will be connected to the 230 kV bus sometime during 2002. This project includes the demolition and removal of the existing generation Units 1 — 5 from the Moss Landing site;
_The applicant will complete any reconductoring work on breaker structures and unit transformers;
_The applicant will furnish and install all control and relay protection for the units and unit transformers.

2. Estimated Work Scope (Duke Energy. 1999a, AFC Appendix 6.18.2, pages 3 - 4): The scope of PG&E s job estimate (with intended accuracy of plus or minus 50%) includes determining the costs associated with the 7 items, which appear below:

_Replacing the existing 1,200 A disconnect switches (i.e., numbers 373, 375, 377, 379, 383, 385, 387, and 389) with new 2000 A disconnects with type RG insulators;
_Reconductoring high voltage connections from 230 kV busses to the breaker structures using bundled 1113 kcmil AAL conductors and 3 SPS tubing where necessary;
_Replacing the 115 kV circuit breaker 162 at Dolan Road substation due to the resulting overstress;
_Providing any line protection changes in other substations connected to MLPPP s 230 kV bus as recommended by PG&E s System Protection;
_Providing the labor associated with switching and clearances;

_Providing labor to test the breakers for which the applicant will furnish the protection schemes; and,
_Providing engineering and other related services.

3. Power Flow Base Case Assumptions and Modifications to PG&E s 2002 Base Case (Duke Energy. 1999a, AFC Appendix 6.18.2, pages 4 - 5):

A. Power Flow Assumptions (6):

PG&E staff conducted the MLPPP PFS power flow and generation sensitivity analysis (utilizing GE s PSLF) using PG&E s 2002 Heavy Summer Peak and 2002 Summer Off Peak base cases. The key assumptions for each of these base cases are included in the following table:

Transmission Line/Generators:	2002 Heavy Summer Pk (MW)	2002 Summer Off Pk (MW)
1. California-Oregon 500 kV	4800	3000
2. California-Oregon 115 kV	80	0
3. Midway-Vincent (South Tie)	Swing Bus	Swing Bus
4. Total Bay Area Load:	8740	6495
5. Total Bay Area (Generation)	4680	3416
6. Generating Units:	Generating Capacity (MW)	Generating Capacity (MW)
a. Pittsburg Units 1 — 7:	2050	1920
b. Contra Costa Units 6 & 7:	680	400
c. Moss Landing 6 & 7	1646	1400

B. Modifications (3) to PG&E s 2002 Base Case:

_New line ratings were modeled for the Lakewood-Meadow Lane and Lakewood-Moraga Junction 115 kV lines;
_New line ratings were modeled for the Pittsburg-Tassajara, Pittsburg-San Ramon, and the Contra Costa-Newark #1 & #2 230 kV lines; and,
_Watsonville substation was modeled as being connected to the Moss Landing-Green Valley 115 kV #1 and #2 lines and removed from the Watsonville-Hollister 60 kV transmission line.

II. Results from PFS s Preliminary Modeling Simulation:

A. Power Flow Study (Duke Energy. 1999a, AFC Appendix 6.18.2, page 5):

The general criteria for selecting overloads consist of simulation modeling with Normal Overloads and with Emergency Overloads. Normal overloads are identified as any transmission facility (i.e., transformer bank, transmission line) reaching 100% or greater with respect to its normal summer rating due to MLPPP expansion. Likewise, emergency overloads are identified as any transmission facility reaching 100% or greater of its summer emergency rating during a single line or transformer contingency due to MLPPP expansion.

The power flow studies conducted for the MLPPP PFS indicate that some emergency condition overloads were identified for the summer peak study and for the off peak study attributable to MLLP expansion. The specific overloaded facilities appear on Tables 2— 5 in the PFS (Section 8.3 pages 7-10).

The MLPPP PFS cites line reconductoring or Remedial Action Scheme (RAS) as potential mitigation measures. The Applicant has indicated its preference for RAS as the mitigation measure. (Duke Energy. 1999k, Attachment)

B. Preliminary Stability Study (Duke Energy. 1999a, AFC Appendix 6.18.2, pages 8 - 9):

The following outages and/or disturbances were modeled by simulating a three-phase fault at a substation bus and cleared after 6 cycles for 230 kV lines and 4 cycles for 500 kV lines.

1. Non-simultaneous loss of each of the 540 MW generating modules. The fault was simulated on the MLPPP 230 kV bus;
2. Moss Landing-Los Banos 500 kV line outage. The fault was simulated on the MLPPP 500 kV bus;
3. Metcalf-Moss Landing 500 kV line outage. The fault was simulated on the MLPPP 500 kV bus;
4. Moss Landing-Metcalf #1 230 kV line outage. The fault was simulated on the MLPPP 230 kV bus;
5. Moss Landing-Metcalf #1 and #2 230 kV double line outage. The fault was simulated on the MLPPP 230 kV bus;
6. Moss Landing-Green Valley #1 115 kV line outage. The fault was simulated on the MLPPP 115 kV bus;
7. Moss Landing-Green Valley #1 and #2 115 kV double line outage. The fault was simulated on the MLPPP 115 kV bus;

The preliminary stability studies, which analyzed the 7 disturbances (appearing above), conducted in conjunction with the addition of the MLPPP expansion show that the transmission network remained stable**.** In any case, the applicant points out that studies of this type are still ongoing and should future stability studies show indication of instability or unacceptable operating conditions then other alternatives such as RAS or generation dropping would be considered to mitigate the stability issue.

ALTERNATIVES

The MLPPP does not require any additional transmission line construction, except for short onsite segments necessary to convey power to the PG&E switchyards immediately adjacent to the MLPPP site. The existing switchyards and power grid are adequately sized and maintained for the additional power generated by the MLPPP (Duke Energy 1999a, AFC page 2-27).

CUMULATIVE IMPACTS

There is insufficient data to fully evaluate cumulative impacts on the transmission system. Other projects, La Paloma, Pastoria, Metcalf, Elk Hills, and the Midway-Sunset Power Project (Midway-Sunset) located in the same general area have filed AFCs with the Energy Commission. It is not likely that La Paloma; Pastoria, Midway-Sunset, or Elk Hills projects will impact the MLPPP. The only projects with AFCs or licenses likely to impact the MLPPP are MEC, DEC, and LMEC (with any impacts from DEC and LMEC being minor).

Since some of these projects have just recently been filed with the Commission by their respective applicants, staff does not have sufficient information nor had a sufficient opportunity to analyze the cumulative impacts resulting from each of these projects being interconnected to California s transmission grid. Staff will assess the available relevant information and include that information in the final staff assessment.

FACILITY CLOSURE

The parallel operation of generating stations is controlled, in part by CPUC Rule 21. This rule and standard utility practices for interconnecting a generating unit provide for the participating transmission owner (PTO) to have control of breakers and disconnect switches where the outlet line terminates (the MLSY) 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[1] and inspects the interconnection facilities. Contractual provisions may be developed to provide backup, or other power service, and codify procedures to be followed during parallel operation. Before generating stations are permitted to bid into the Cal-PX and be dispatched by the Cal-ISO, generator standards must be met and the generating station must commit to comply with instructions of the Cal-ISO dispatchers. All participating generators must sign a Participating Generator Agreement (Cal-ISO 1998a, Cal-ISO 1998b). Procedures for planned, unexpected temporary closure and unexpected permanent closure must be developed or verified to facilitate effective communication and coordination between the generating station owner, the PTO and the Cal-ISO to ensure safety and system reliability.

CPUC General Order 95, Rule 31.6 requires that lines or portions of lines permanently abandoned shall be removed by their owners so that such lines shall not become a public nuisance or a hazard to life or property. 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:

[1] As an example, the PTO has control over the generating unit breakers so that only when the PTO s line crews have completed maintenance, for instance, and are clear of the line or other facilities, could the unit reclose the system.

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[2] to assure (as one example) that the PTO s system will not be closed into the outlet thus energizing the project substation. Alternatively, the owner may coordinate with the PTO to maintain some power service via the outlet line to supply critical station service equipment or other loads.

UNEXPECTED TEMPORARY CLOSURE

This unplanned closure occurs when the facility is closed suddenly and/or unexpectedly for a short term due to unforeseen circumstances such as a natural or other disaster or emergency. During such a closure the facility cannot insert power into the utility system. Closures of this sort can be accommodated by establishment of an on-site contingency plan (see General Conditions Including Compliance Monitoring and Closure Plan).

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs when the project owner abandons the facility. This is considered to be a permanent closure. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. An on-site contingency plan, that is in place and approved by the CPM prior to the beginning of commercial operation of the facilities, will be developed to assure safety and reliability (see General Conditions Including Compliance Monitoring and Closure Plan).

[2] The PTO, in this instance, is PG&E, e.g., the system owner to which the project is interconnected.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff has reviewed the PFS and the Cal-ISO has provided comments on its review of the MLPPP PFS (Duke Energy 1999a, AFC pages 1 — 9). The Cal-ISO s comments on the MLPPP PFS indicate that the applicant will need to: a) reinforce some facilities near MLPPP so that MLPPP will reliably be able to interconnect to the ISO Controlled Grid; and b) provide the Cal-ISO staff with additional information prior to being granted preliminary interconnection approval for the MLPPP expansion. This information is anticipated to be available in early January and will be included in Staff s and the Cal-ISO s testimony. Further, Cal-ISO directs the applicant to conduct additional transmission studies on MLPPP before final interconnection approval can be granted (Cal-ISO 1999a, page 1). Commission Staff concurs with the Cal-ISO s assessment and this information will be provided for Commission review per Condition of Certification **TSE-1e**. Once final Interconnection approval is granted, MLPPP will be in compliance with the appropriate reliability criteria, assuming implementation of the conditions of certification below.

RECOMMENDATIONS

Upon the applicant meeting the Cal-ISO s terms and conditions specified above and receiving preliminary interconnection approval for its MLPPP, 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 substation configurations is acceptable.

a. The power plant switchyard, outlet line and termination shall meet or exceed the requirements CPUC General Order 95.

b. Termination facilities shall comply with applicable Cal-ISO and PG&E interconnection standards (PG&E Interconnection Handbook and CPUC Rule 21).

c. Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner s standards.

d. The MLPPP conductors shall be sized to accommodate the full output from both 530 MW units.

e. The applicant shall provide a DFS including a description of RAS sequencing and timing, if applicable, and an executed Facility Interconnection Agreement for the MLPPP transmission interconnection with PG&E. The DFS and Interconnection Agreement shall be coordinated with the Cal-ISO and shall comply with Cal-ISO comments detailed in its November 3rd letter to the project owner or with Cal-ISO s comments as modified by mutual agreement between Duke Energy and the Cal-ISO. (Duke Energy 1999a, AFC pages 1 — 9).

Verification: At least 60 days prior to start of construction of transmission facilities, the project owner shall submit for approval to the CPM, electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements 1a through 1e above. The DFS and executed interconnection agreement shall concurrently be provided. Substitution of equipment and substation configurations shall be identified and justified by the project owner for CPM approval

TSE-2 the project owner shall inform the CPM of any impending changes, which may not conform to the requirements 1a through 1e of TSE-1, and have not received CPM approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction, involving changed equipment or substation configurations, shall not begin without prior written approval of the changes by the CPM.

Verification: At least 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, Cal ISO Standards, the PG&E Interconnection Handbook, 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 the registered electrical

engineer in charge. A statement attesting to conformance with CPUC GO-95, Cal-ISO Standards, the PG&E Interconnection Handbook, CPUC Rule No. 21, , and these conditions shall be concurrently provided.

REFERENCES

Cal-ISO (California System Operator). 1998a. Cal-ISO Tariff Scheduling Protocol, posted April 1998, Amendments 1, 4, 5, 6, and 7 Incorporated.

Cal-ISO (California System Operator). 1998b. Cal-ISO Dispatch Protocol, posted April 1998.

Cal-ISO (California System Operator). 1999a. Preliminary comments on the PG&E DFS for MLPPP dated November 3, 1999 and docketed on November 22, 1999.

Duke Energy. 1999a. Application for Certification, Moss Landing Power Plant Project (99-AFC-4). Submitted to the California Energy Commission, May 7, 1999.

Duke Energy. 1999i. Duke Energy supplemental to the AFC detailing upgrade changes to Units 6 & 7. Submitted to the Energy Commission on 11/22/99.

Duke Energy. 1999k. Duke Energy supplemental filing regarding electric transmission system overload/Moss Landing Power Plant. Submitted to the Energy Commission on 11/04/99.

NERC (North American Electric Council). 1998. NERC Planning Standards, September 1997.

WSCC (Western Systems Coordinating Council). 1997. Reliability Criteria, August 1998.

DEFINITION OF TERMS

ACSR	Aluminum cable steel reinforced. 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 conductors, 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.
Megavar	One megavolt ampere reactive.
Megavars	Megavolt-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, divided by 1000.
Megawatt (MW)	A unit of power equivalent to 1,341 horsepower.

Normal Operation	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.

ALTERNATIVES

Paul Richins

INTRODUCTION

Energy Commission staff is required by Title 20, California Code of Regulations Section 1765 of the Energy Commission s siting regulations to examine the feasibility of available site and facility alternatives to the applicant s proposal which substantially lessen the significant adverse impacts of the proposal on the environment . The Guidelines for Implementation of the California Environmental Quality Act (CEQA), Title 14, California Code of Regulations, Section 15112(d), provides further direction by requiring an evaluation of the comparative merits of a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the project objectives.

The purpose of staff s alternatives analysis is to provide the Energy Commission with an analysis of a reasonable range of feasible alternatives which would attain most of the basic objectives of the project, but substantially reduce or avoid any potentially significant adverse impacts of the proposed project. (Cal. Code Regs., tit. 14,/15126.6(a); tit. 20,/1765). This analysis identifies the potentially significant impacts of the proposed project, and those project alternatives that are capable of reducing or avoiding significant impacts.

The environmental consequences of the proposed project are discussed in detail in the individual sections of this document. Staff has identified potential project related impacts in traffic, water resources, and biological resources. Water and biological resources are affected by the high temperature of the outflow water and by the large volume of water that could be circulated through the power plant. This large volume of water could increase the incidence of entrainment and impingement. Traffic may be a potentially adverse problem during the construction phase of the project.

Section 25540.6(b) of the Warren-Alquist Act exempts a facility from a discussion of site alternatives if the commission finds that the project has a strong relationship to the existing industrial site and that it is therefore reasonable not to analyze alternative sites for the project. (Pub. Resources Code,/25540.6(b)). The commission has not yet made such a finding for this project. The staff believes that there is a strong connection between the proposed project and the existing Moss Landing Power Plant site as the project will use existing infrastructure including the once-through cooling system, the natural gas supply pipeline, the wastewater disposal pipeline, and the transmission lines and adjacent switchyard. However, Energy Commission staff will conduct an alternatives analysis in order to ensure a thorough analysis of the project.

METHODOLOGY

To prepare this alternatives analysis, staff used the methodology summarized below:

- Identified the basic objectives of the project;
- Provided an overview of the project and potentially significant adverse impacts;

- Evaluated the no project alternative;
- Identified and evaluated feasible alternative electricity generation technologies;
- Identified screening criteria;
- Conducted a screening analysis to assess the feasibility of the alternative sites mentioned by the applicant and staff;
- Determined whether the alternative technologies and sites reduced or avoided any significant impacts of the proposed project;
- Determined whether the alternative technologies and sites would cause one or more impacts that could be significant;

BASIC PROJECT OBJECTIVES

After studying the Moss Landing Power Plant Project (MLPPP) Application for Certification (AFC), Energy Commission staff has determined the project s objectives to be:

- The construction and operation of a merchant power plant in the Monterey County region that supplies economic, reliable and environmentally sound electrical energy and capacity in the newly deregulated power market;
- The generation of approximately 1060 MW of electricity;
- The utilization of an existing power generation site and existing ancillary facilities;
- The location of the site near key infrastructure, such as transmission line interconnections (230-kv or greater), and supplies of process water and natural gas;
- The improvement of local electric reliability while reducing electric system losses.

DETERMINING THE SCOPE OF THE ALTERNATIVES ANALYSIS

In considering locational alternatives, the staff had to determine a reasonable geographical area. Since alternatives must consider the underlying objectives of the proposed project, staff confined the geographic area of locational alternatives to the Monterey County region. Locational alternatives beyond this region would be inconsistent with the project objectives.

These siting alternatives assume that the proposed MLPPP is unmitigated. The alternative sites presented here were compared with the MLPPP before the proposed mitigation. None of these alternative sites has been subjected to an in-depth analysis similar to that conducted for the MLPPP site. Each alternative site, however, provides adequate information for the decision-makers consistent with CEQA and Energy Commission regulations.

SETTING

SITE AND VICINITY

The proposed project is located within the existing Moss Landing Power Plant. The power plant site encompasses 239 acres and is situated adjacent to the PG&E

Moss Landing Switchyard. The project site is zoned Heavy Industrial with electric power plants being an allowable use. The project site consists of 7 generating units (2 of which are currently in operation), 10 exhaust stacks, 19 fuel storage tanks, 2 seawater inlet and outfall structures, various warehouse and office buildings, and other related equipment. Duke Energy purchased the site from PG&E on July 1, 1998 and currently operates units 6&7, producing 1,500 MW of electricity.

The applicant chose the proposed site for the following reasons:

- Infrastructure for the power plant is already in place;
- The site is close to the PG&E Moss Landing Switchyard where the applicant will connect to the transmission system;
- The site contains existing once-through seawater cooling water intake and discharge structures;
- The site would result in a lower level of environmental impact when compared to other site possibilities within Monterey County;

The applicant has requested certification to add 1060 MW to the MLPPP. This would bring the total output of the site to 2590 MW. The applicant proposes to replace existing generating Units 1 through 5 (613 MW) with two 530-MW combined-cycle generation units. In addition, Duke will dismantle the eight 225-foot tall stacks that were previously used for the retired Units 1 through 5 and install four 145-foot exhaust stacks. Duke plans to place the two new generation units on land that is currently occupied by several fuel oil storage tanks. Duke will also redesign the cooling system so that outflow is diverted into the bay instead of into the more sensitive Elkhorn Slough. The project will not require installation of new high-voltage transmission lines. Electrical connections will be constructed within the power plant site to connect the new units to the adjacent switchyard.

RELATED FACILITIES

Electricity generated by the MLPPP would be transmitted to Pacific Gas & Electric s (PG&E) Moss Landing Switchyard immediately north of the plant. The project does not require any additional transmission line construction, except for short onsite line segments necessary to convey power to the PG&E switchyards. The existing switchyards and power grid are adequately sized and maintained for the additional power generated by the project.

The project will use existing seawater intake structures for retired Units 1 through 5 and the existing seawater discharge structure for Units 6 and 7. New traveling screens will be installed 350 feet west of their current location in order to minimize entrapment and impingement of biota.

Most of the nonhazardous wastewater generated will be discharged through existing cooling water outfalls. New pipelines will not be needed.

The project will use existing natural gas pipelines for fuel delivery. However, short segments of natural gas distribution lines will be extended to the Project from the existing onsite metering station, which will be modified to meet pressure

requirements. The Project will provide a gas compressor to adequately support the combined-cycle units, but no change in pipeline capacity will be required.

ANALYSIS

THE NO PROJECT ALTERNATIVE

The CEQA Guidelines state, The purpose of describing and analyzing a no-project alternative is to allow decisionmakers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. (Cal. Code Regs., tit./15126.6(e).) Toward that end, the no-project analysis considers existing conditions and what would be reasonably expected to occur in the foreseeable future if the project were not approved (Ibid.)

The no project alternative assumes that the proposed project is not constructed. In this case, the no project alternative would be leaving the plant as is . Units 1-5 would remain non-operational, units 6 & 7 would remain in operation, and the eight existing smokestacks would remain in place. No new combined-cycle units would be added.

In the MLPPP Application for Certification (AFC), Duke presented the no project alternative as not consistent with their objectives and provided two supporting arguments for their conclusion (MLPPP 1999, AFC page 5-6). First, Duke argues that the no project alternative would result in less efficient local, state, and regional transmission and distribution of electricity because electricity needed in the area would have to be routed from the Los Banos substation. Second, Duke argues that the no project alternative would result in greater environmental impacts because high demand for electricity would continue to be placed on older, less efficient power generating facilities.

With respect to local, state, and regional transmission and distribution of electricity, the current system transmits power used in the region from the Los Banos substation to the MLPPP switchyard. The no project alternative would maintain this current system. The proposed project would result in the increased power generated by the MLPPP tying directly into the MLPPP switchyard and being dispersed to local loads, thereby reducing the quantity of electricity imported from Los Banos and thus shortening the transmission route and, as a result, lessening the loss of electricity.

As for the visual impacts, under the no project alternative eight 225-foot smokestacks and the fuel storage tanks would not be removed, thereby maintaining the visual impact that exists today. Duke proposes to remove these large exhaust stacks and replace them with four 145-foot exhaust stacks, thus slightly reducing the visual impact of the power plant. Duke also proposes to remove the large fuel storage tanks on the property, thus further reducing the visual impact of the power plant. In this regard, the proposed project would be superior to the no project alternative.

Presently it is unclear whether the no project alternative would have less of an impact on biological resources. Currently MLPPP releases water into the ocean at 28 degrees above the ambient temperature and at a rate of 300,000 gallons per minute (gpm). The two new combined cycle units would release approximately 300,000 gpm at 20 degrees above the ambient temperature. Added to the current release, this would result in the release of approximately 600,000 gpm at 24 degrees above the ambient temperature, on average. While the proposed project would result in lower temperatures, it would double the volume of water discharged, thus increasing the size of the area affected. The project would also double the volume of water circulated through the plant, likely increasing the incidence of entrainment and impingement. This may create a potentially significant adverse effect. The no project alternative would retain the 300,000 gpm inflow and outflow, thus resulting in a reduced area of impact. The no project alternative, however, would also potentially have water resources implications due to the high temperature of the outflow water.

The no project alternative would definitely have less of an impact on traffic than would the proposed project. Since there would be no construction there would be no construction-related traffic and therefore no adverse impact.

CEQA requires consideration of the no project alternative, requiring agencies to evaluate whether no project is environmentally preferable to the proposed project. It is unclear at the moment whether the no project alternative is environmentally preferable to the proposed project. Further analysis needs to be done on the thermal plume and the biological effects of water circulation before such a determination can be made.

GENERATION TECHNOLOGY ALTERNATIVES

Public Resources Code section 25305(c) states that conservation, load management, or other demand reducing measures reasonably expected to occur shall be explicitly examined in the Energy Commission s energy forecasts and shall not be considered as alternatives to a proposed facility during the siting process. The forecast that will address this issue is the Commission s California Energy Outlook. Thus, such alternatives are not included in this analysis.

Staff compared various alternative technologies with the proposed project. We examined the principal electricity generation technologies that do not burn fossil fuels such as natural gas. These are geothermal, solar, hydroelectricity, wind, biomass, waste-to-energy. Staff also looked at coal and nuclear power generation to provide a thorough analysis of alternative generation technologies.

There are no viable geothermal resources in the Monterey County region. Solar, wind and hydroelectricity resources would require large land areas in order to generate 1,060 megawatts of electricity. Specifically, centralized solar projects using the parabolic trough technology require approximately 5 acres per megawatt; 1,060 megawatts would require approximately 5,300 acres, more than 22 times the amount of space taken by the current plant site and linear facilities. Photovoltaic

arrays require similar acreage per megawatt. Centralized wind generation areas generally require 40-50 acres per megawatt, with 1,060 megawatts requiring 42,400-53,000 acres, more than 182 times the amount of space taken by the current plant site and linear facilities. Wind generation also has environmental effects. Large wind farms can have significant visual impacts and in some areas these have resulted in a large number of raptor deaths. The noise generated by the wind turbines might also be of concern. Large hydroelectric facilities generating 1,060 megawatts would inundate more than 70,000 acres with water, resulting in extensive biological and environmental impacts.

Biomass facilities do not require the extensive amount of land of the above alternatives. However, most biomass facilities are only in the range of 5-25 MW, insufficient for Duke s objectives. They also generate significant air emissions and require numerous truck deliveries to supply the plant with the waste. Also, in waste-to-energy facilities there is some concern regarding the emission of toxic chemicals, such as dioxin, and the disposal of the resultant toxic ash.

Potential significant effects also arise in constructing transmission line interconnections to connect a renewable power facility to a nearby transmission line.

The alternative technologies discussed above have the potential for significant land use, biological and visual impacts. Consequently, staff does not believe that these technologies present any feasible alternatives to the proposed project.

Staff also considered the option of building a coal-fired power plant. Conventional boiler steam turbine technology using coal as a fuel would be feasible for commercial scale generation. However, coal would have to be imported from outside California, resulting in increased truck and/or train traffic, and coal storage issues. Furthermore, coal combustion results in a higher level of emissions than that for natural gas burning facilities. Also, the Monterey County Coastal Implementation Plan allows the use of coal only if other cleaner fuels become unavailable. For these reasons staff concluded that this alternative technology option is not superior to the proposed project.

Staff did not consider the possibility of a nuclear power plant alternative. California law prohibits new nuclear plants until the scientific and engineering feasibility of disposal of high-level radioactive waste has been demonstrated. Consequently, staff concluded that this alternative technology is not feasible.

Staff also considered the possibility of a smaller sized alternative, such as a 240 MW gas fired combined cycle project located at the MLPPP site. This is less electricity than the applicant proposes to add, but is considered here as an alternative in order to facilitate a thorough analysis of project options. This smaller project would significantly reduce the amount of cooling water required for the project thereby reducing the quantity of biota impinged or entrained and reducing the size of the thermal plume; however, this would also result in a higher thermal discharge temperature than the proposed project. This alternative would not reduce

the impact from increased traffic and presently it is unclear whether this alternative would reduce a potentially significant impact in biological and water resources.

ALTERNATIVE SITE SCREENING ANALYSIS

Alternative sites were identified through a review of the applicant s AFC and an analysis of site availability within Monterey County. The AFC did not contain any alternative sites. No alternative sites were proposed by the public. Therefore staff selected four alternative sites that satisfied the preliminary site requirements within Monterey County.

In the MLPPP AFC, Duke listed several key criteria required for reasonable selection of an offsite alternative. (MLPPP AFC 5-4). The site would have to be large enough to support a 1060 MW power plant. We estimate this to be approximately 15-20 acres. The site would have to have sufficient infrastructure or access thereto within a reasonable outlying distance to support a 1060 MW power plant. This would include: (1) Natural gas pipelines (24 inch or larger); (2) Major roads to support deliveries and operations; (3) Water for utilities and cooling (e.g. ground water, reclaimed water); and (4) reasonably close proximity to an existing transmission line system to facilitate connecting transmission lines and switching facilities (230-kv or higher and with the capacity for the new plant).

Staff found no alternative coastal site that could support a facility of this size. This is due to the lack of Heavy Industry zoning (which would be required for construction of a power plant) in coastal areas. Staff was therefore required to search for inland site alternatives for this project. The use of an inland site would require a change in the cooling system from once-through ocean water cooling to an air-cooled condenser or to cooling tower technologies. This would entail a significant change in facility design, but is contemplated here in order to conduct a thorough analysis of site alternatives.

ALTERNATIVE SITES

SAN LUCAS SITE ALTERNATIVE

PROJECT AND SITE DESCRIPTION

- The San Lucas site is located in the city of San Lucas. It is bordered by Monterey Street to the east and Main street to the south. It lies approximately 2,700 feet west of State Highway 198.
- The surrounding land uses are residential, industrial and agricultural.
- The natural gas supply interconnection line would be approximately 2 miles long.
- The transmission system interconnection line would be approximately 14 miles long.

ADVANTAGES

- This site is zoned industrial.

- The site is near Highway 198 and adjacent to Highway 101 and a railroad line thus facilitating material transport for deliveries and operations.

DISADVANTAGES

- The surrounding land is zoned for residential use.
- The site lies near a potentially active fault.
- There is a groundwater overdraft in the Greater Salinas area, thereby creating potential water supply problems for the coolant system. Use of reclaimed water is not feasible.
- There are no existing transmission lines nearby that are capable of supporting a 1090 MW power plant.
- The site is near a riparian creek corridor, which is considered an area of special biological importance by the California Department of Fish and Game. There is a potential for adverse biological impacts to protected species including kit foxes. Possible adverse biological impacts to raptors including protected southern bald eagles from transmission lines.
- A nearby school and residential area makes traffic and noise a potentially adverse impact.

SAN ARDO SITE ALTERNATIVE

PROJECT AND SITE DESCRIPTION

- Staff looked at the San Ardo oil fields as a possible alternative site.
- The site is located approximately 3 miles south of the city of San Ardo and immediately east of Highway 101 and the Salinas River.
- The natural gas supply pipeline would be approximately 3 miles long.
- The transmission system interconnection line would be approximately 16 miles long.

ADVANTAGES

- Surrounding area is not zoned for residential use
- The land is not being cultivated
- Existing industrial-type uses (oil fields) reduce visual resource impacts that would otherwise exist at this site
- The site is adjacent to Highway 101, thus facilitating material transport for deliveries and operations. However there is no direct access from 101. Traffic would have to go through the town or the applicant would have to build a temporary road.

DISADVANTAGES

- The south county section of Monterey County suffers from groundwater overdraft conditions, thereby creating potential water supply problems for the coolant system. Use of reclaimed water is not feasible.
- The groundwater in the San Ardo mineral oil fields is high in sulfur, thereby making it unsuitable for use in a utility cooling system.
- The site lies within a 100-year floodplain.

- The specific plan states that the industrial designation in the San Ardo area is intended exclusively for activities related to oil extraction.
- There are no existing transmission lines nearby capable of supporting a 1090 MW power plant.
- The site is near a riparian creek corridor, which is considered an area of special biological importance by the California Department of Fish and Game.
- The site is near an environmentally sensitive heron rookery.
- There is a potential for adverse biological impacts to protected species including bald and golden eagles from the transmission lines.

RANCHO SAN JUAN SITE ALTERNATIVE

PROJECT AND SITE DESCRIPTION

- This site lies immediately north of the city of Salinas. It is bordered by Harrison road to the west and San Juan road to the east.
- The natural gas supply interconnection line would be approximately 1 mile long.
- The transmission system interconnection line would be approximately 1 mile long.

ADVANTAGES

- The site is zoned industrial.
- The site is near Highway 101 and major roads, thus facilitating material transport for deliveries and operations.
- Does not appear to be any adverse biological issues.
- The site does not require construction of lengthy auxiliary lines.
- Use of reclaimed water or irrigation return flow for cooling may be feasible.

DISADVANTAGES

- The site lies along a proposed scenic highway.
- Industrial uses that need large quantities of water for production, that could cause groundwater contamination or significant point source air pollution emissions, are not permitted within this area.
- There is a potential for adverse biological impacts to protected species including the brown pelican and least tern.

OLD STAGE ROAD ALTERNATIVE

PROJECT AND SITE DESCRIPTION

- This site lies 2 _ miles east of the Rancho San Juan alternative; immediately east of Old Stage Road. San Juan Road is the nearest road to the north and Natividad Road lies immediately southwest of the site.
- The transmission system interconnection line would be approximately 2 miles long.
- The natural gas interconnection line would be approximately 2 miles away.

ADVANTAGES

- This site is not encumbered by the same industrial use restrictions as the Rancho San Juan alternative.
- The use of reclaimed water or irrigation return flows for cooling may be feasible.
- There does not appear to be any adverse biological issues.
- There is adequate access to the site with many options for transportation routes.
- Nearby land is not zoned for residential use.
- The site is zoned industrial.
- The site does not require construction of lengthy auxiliary lines.

DISADVANTAGES

- The site lies along a scenic highway.
- There is a potential for adverse biological impacts to protected species including the brown pelican and least tern.

CONCLUSION

CEQA requires the project alternatives analysis to focus on measures that would mitigate a project s potential impacts to less than significant levels. In the MLPPP these potential impacts are in traffic, biological resources and water resources. Of the four alternative sites considered, three did nothing to reduce the potential for traffic, biological resources and water resources impacts to a level lower than that of the proposed project.

Other than the proposed Moss Landing site, the single remaining alternative site that staff would consider potentially feasible, with mitigation measures, is the Old Stage Road alternative. This alternative site has the potential for use of reclaimed water which would have less impact than the proposed project on water resources. Mitigation measures identified at this time would include visual screening and other mitigation measures identified for the proposed site to lessen biological resources impacts. Other unforeseen mitigation measures may be identified and required if this site is pursued either by Moss Landing or any other entity.

The option of a smaller project, such as a 240 MW combined cycle unit would still have traffic, biological resources and water resource impacts similar to the proposed project. Therefore, the smaller option is not better than the proposed project.

REFERENCES

Duke Energy Moss Landing, L.L.C. Application for Certification for Moss Landing Power Plant. 1999.

Duke Energy Moss Landing, L.L.C. Supplemental Filing: Change in Project Description. November 22, 1999.

Monterey County Planning Department. 1987Central Salinas Valley Area Plan. As amended December 5, 1995.

Monterey County Planning Department. 1986 Greater Salinas Area Plan. As amended February 14, 1995.

Monterey County Planning Department. 1988 South County Area Plan. As amended December 5, 1995.

COMPLIANCE MONITORING PLAN INCLUDING GENERAL CONDITIONS AND CLOSURE PLAN

Jeri Zene Scott

INTRODUCTION

The Compliance Monitoring Plan (Compliance Plan) has been established as required by Public Resources Code section 25532. The plan provides a means for ensuring that the Moss Landing Power Plant is constructed and operated in compliance with air and water quality, public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission (Energy Commission) and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of the following elements:

1. General conditions that:
   a. set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
   b. set forth the requirementfor handling confidential records and maintaining the compliance record;
   c. state procedures for settling disputes and making post-certification changes;
   d. state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions; and
   e. establish requirements for facility closure plans.
2. Specific conditions of certification:

Specific conditions of certification that follow each technical area contain the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of verifying that the condition has been satisfied.

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. Technical staff from both the Energy Commission and the project owner will meet to review the status of all pre-construction or pre-operation Energy Commission s conditions of certification. They will determine whether all requirements 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 be, upon request to the project owner, given unrestricted access to the files.

COMPLIANCE VERIFICATIONS

Each condition of certification is followed by a means of verification . The verification describes the Energy Commission s procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified, as necessary by the CPM, and in most cases without full Energy Commission approval.

Verification of compliance with the conditions of certification can be accomplished by:

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

Verification lead times (e.g., 90,60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The**

cover letter subject line shall identify the involved condition(s) of certification by condition number and include a brief description of the subject of the submittal. The project owner shall also identify those submittals **not** required by a condition of certification with a statement such as: This submittal is for information only and is not required by a specific condition of certification. When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.

The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All submittals shall be addressed as follows:

Compliance Project Manager
Moss Landing Power Plant Project (99-AFC-4C)
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 compliance reports.

COMPLIANCE MATRIX

The project owner to the CPM along with each monthly and annual compliance report shall submit a compliance matrix. The compliance matrix is intended to provide the CPM with the current status of <u>all</u> 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
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.

START OF CONSTRUCTION

Construction shall not commence until this matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing the start of 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 day anticipated for the start of construction. It is important that the project owner understand that pre-construction activities are performed at their own risk. Failure to allow appropriate lead-time may cause delays in start of construction.

MONTHLY COMPLIANCE REPORT

The first Monthly Compliance Report is due the month following the Energy Commission business meeting date that the project was approved, unless the otherwise agreed to by the CPM. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the Key Events List. The Key Events List is found at the end of this section.

During pre-construction and construction of the project, the project owner or authorized agent shall submit Monthly Compliance Reports within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain at a minimum:

1. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;

3. an initial, and thereafter updated, compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
4. a list of conditions which have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;
5. a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;
6. a cumulative listing of any approved changes to conditions of certification;
7. a listing of any filings with, or permits issued by, other governmental agencies during the month;
8. a projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance conditions of certification;
9. a listing of the month s additions to the on-site compliance file; and
10. any requests to dispose of items that are required to be maintained in the project owner s compliance file.
11. a listing of complaints, notices of violation, official warnings, and citations received during the month; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

ANNUAL COMPLIANCE REPORT

After the air district has issued a Permit to Operate, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by the CPM. Each Annual Compliance Report shall identify the reporting period and shall contain the following:

1. an updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
2. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Annual Compliance Report;
4. a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;
5. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;

6. a listing of filings made to, or permits issued by, other governmental agencies during the year;
7. a projection of project compliance activities scheduled during the next year;
8. a listing of the year s additions to the on-site compliance file, and
9. an evaluation of the on-site contingency plan for unexpected facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section].
10. a listing of complaints, notices of violation, official warnings, and citations received during the year; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

CONFIDENTIAL INFORMATION

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

DEPARTMENT OF FISH AND GAME FILING FEE

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

REPORTING OF COMPLAINTS, NOTICES, AND CITATIONS

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering, with date and time stamp recording. The telephone number shall be posted at the project site and easily visible to passersby during construction and operation.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt, to the CPM. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the Complaint Form, which follows:

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME:
AFC Number:

COMPLAINT LOG NUMBER _____
Complainant's name and address:

Phone number:

Date and time complaint received:

Indicate if by telephone or in writing (attach copy if written):
Date of first occurrence:

Description of complaint (including dates, frequency, and duration):

Findings of investigation by plant personnel:

Indicate if complaint relates to violation of a CEC requirement:
Date complainant contacted to discuss findings:

Description of corrective measures taken or other complaint resolution:

Indicate if complainant agrees with proposed resolution:
If not, explain:

Other relevant information:

If corrective action necessary, date completed:
Date first letter sent to complainant: _____(copy attached)
Date final letter sent to complainant: _____(copy attached)

This information is certified to be correct.
Plant Manager's Signature: _____ Date:

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

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made which provide the flexibility to deal with the specific situation and project setting which will exist at the time of closure. LORS pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure.

PLANNED CLOSURE

This planned closure occurs at the end of a project s life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

UNEXPECTED TEMPORARY CLOSURE

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

UNEXPECTED PERMANENT CLOSURE

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

GENERAL CONDITIONS FOR FACILITY CLOSURE

PLANNED CLOSURE

In order that a planned facility closure does not create adverse impacts, a closure process, that will provide for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the CPM). The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.

The plan shall:

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.

1. 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;

2. Identify all facilities or equipment that will a) be immediately removed from the site after closure (e.g. hazardous materials); b) temporarily remain on the site after closure (e.g., until the item is sold or scrapped); and c) permanently remain on site after closure. The plan must explain both why the item cannot be removed and why it does not present a risk of harm to the environment and the public health and safety to remain *insitus* for in indefinite period.

3. 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.

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 it is determined 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 determination. The CPM and the project owner may agree to a period of time other than 90 days.

UNEXPECTED PERMANENT CLOSURE

The on-site contingency plan required for unexpected temporary closure shall also cover unexpected permanent facility closure. All of the requirements specified for unexpected temporary closure shall also apply to unexpected permanent closure.

In addition, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the unlikely event of abandonment.

In the event of an unexpected permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, etc., within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

A closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the permanent closure (or other period of time agreed to by the CPM).

DELEGATE AGENCIES

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

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

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

ENFORCEMENT

The Energy Commission s legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Commission Decision.

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

NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1230 et. seq., but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by current law or regulations.

INFORMAL DISPUTE RESOLUTION PROCEDURE

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

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1230 et. seq., but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The procedure encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be referred to the full Energy Commission for consideration via the complaint and investigation process. The procedure for informal dispute resolution is as follows:

REQUEST FOR INFORMAL INVESTIGATION

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission s terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and within seven (7) working days of the CPM s request, provide a written report of the results of the investigation, including corrective measures proposed or undertaken, to the CPM. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to provide an initial report, within forty-eight (48) hours, followed by a written report filed within seven (7) days.

REQUEST FOR INFORMAL MEETING

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner s report, investigation of the event, or corrective measures undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within fourteen (14) days of the project owner s filing of its written report. Upon receipt of such a request, the CPM shall:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;

2. secure the attendance of appropriate Energy Commission staff and staff of any other agency with expertise in the subject area of concern as necessary;

3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner; and,

4. after the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum which fairly and accurately identifies the positions of all parties and any conclusions reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et. seq.

FORMAL DISPUTE RESOLUTION PROCEDURE-COMPLAINTS AND INVESTIGATIONS

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution process, such party may file a complaint or a request for an investigation with the Energy Commission s General Counsel. Disputes may pertain to actions or decisions made by any party including the Energy Commission s delegate agents. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230 et. seq.

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

POST CERTIFICATION CHANGES TO THE COMMISSION DECISION: AMENDMENTS, 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	

MOSS LANDING PREPARATION TEAM

Executive Summary	Paul Richins
Introduction	Paul Richins
Project Description	Paul Richins
Need Conformance	Jeff Ogata
Air Quality	Matthew Layton
Public Health	Obed Odoemelam
Worker Safety and Fire Protection	Kathi Hann & Chris Tooker
Transmission Line Safety and Nuisance	Obed Odoemelam
Hazardous Materials Management	Rick Tyler
Waste Management	Mike Ringer
Land Use	Eric Knight
Traffic and Transportation	Steve Brown
Noise	Steve Baker
Visual Resources	David Flores
Cultural Resources	Dorothy Torres & Deborah K. McLean
Socioeconomic Resources	Amanda Stennick
Biological Resources	Marc Sazaki
Soil and Water Resources	Joe O Hagan & Lorraine White
Geology and Paleontology	Robert Anderson
Facility Design	M. Kisabuli
Power Plant Reliability	Steve Baker
Power Plant Efficiency	Steve Baker
Transmission System Engineering	Al McCuen & Charles Bartanian

Alternatives .....Lisa DeCarlo & Paul Richins

Compliance Monitoring and Facility Closure .....Jeri Zene Scott

Project Secretary.....Luz Manriquez and Sharee Knight

Webmaster ..... Bob Aldrich